

DICHIARAZIONE DI PRESTAZIONE

DoP 0383

per il Sistema a Iniezione fischer T-Bond PRO.1 - FIS C700 HP PRO.1 (ancorante chimico per l'utilizzo nel calcestruzzo)

IT

1. Codice di identificazione unico del prodotto-tipo: **DoP 0383**
2. Usi previsti: **Fissaggio post-installato in calcestruzzo fessurato o non fessurato, vedi appendice, in particolare gli allegati da B1 - B9.**
3. Fabbricante: **fischerwerke GmbH & Co. KG, Klaus-Fischer-Str. 1, 72178 Waldachtal, Germany**
4. Mandatario: **-**
5. Sistemi di VVCP: **1**
6. Documento per la valutazione europea: **EAD 330499-02-0601, Edition 12/2023**
Valutazione tecnica europea: **ETA-17/0435; 2025-03-21**
Organismo di valutazione tecnica: **DIBt- Deutsches Institut für Bautechnik**
Organismi notificati: **2873 TU Darmstadt**
7. Prestazioni dichiarate:
Resistenza meccanica e stabilità (BWR 1)
Resistenza caratteristica al carico di tensione (carico statico e quasi-statico):
 - 1) Resistenza alla rottura dell'acciaio: vedi appendice, in particolare gli allegati da C1, C2, C3
 - 2) Resistenza alla rottura del calcestruzzo combinata con sfilamento: vedi appendice, in particolare gli allegati da C4 - C6
 - 3) Resistenza alla rottura del cono di calcestruzzo: vedi appendice, in particolare gli allegati da C4
 - 4) Distanza dal bordo per evitare lo splitting sotto carico: vedi appendice, in particolare gli allegati da C4
 - 5) Robustezza: vedi appendice, in particolare gli allegati da C4 - C6
 - 6) Massima coppia di installazione: vedi appendice, in particolare gli allegati da B3, B4
 - 7) Distanza dal bordo e interassi minimi, Spessore dell'elemento: vedi appendice, in particolare gli allegati da B3 - B5**Resistenza caratteristica al carico di taglio (carico statico e quasi statico):**
 - 8) Resistenza alla rottura dell'acciaio: vedi appendice, in particolare gli allegati da C1, C2, C3
 - 9) Resistenza alla rottura per pry-out: vedi appendice, in particolare gli allegati da C4
 - 10) Resistenza alla rottura del bordo di calcestruzzo: vedi appendice, in particolare gli allegati da C4**Spostamenti con carichi a breve e a lungo termine:**
 - 11) Spostamenti con carichi a breve e a lungo termine: vedi appendice, in particolare gli allegati da C7, C8
 - 12) Resistenza nel calcestruzzo rinforzato con fibre d'acciaio: NPD**Resistenza e spostamenti caratteristici per le categorie di prestazione sismica C1 e C2:**
 - 13) Resistenza al carico di trazione, categoria C1: NPD
 - 14) Resistenza al carico di trazione, categoria C2: NPD
 - 15) Resistenza al carico di taglio, categoria C1: NPD
 - 16) Resistenza al carico di taglio, categoria C2: NPD**Sicurezza in caso di incendio (BWR 2)**
 - 17) Reazione al fuoco: Classe (A1)**Resistenza al fuoco:**
 - 18) Resistenza al fuoco alla rottura dell'acciaio (carico di trazione): NPD
 - 19) Resistenza al legame in condizioni di incendio: NPD
 - 20) Resistenza al fuoco alla rottura dell'acciaio (carico di taglio): NPD**Igiene, salute e ambiente (BWR 3)**
 - 21) Contenuto, emissione e/o rilascio di sostanze pericolose: NPD
8. Documentazione tecnica appropriata e/o documentazione tecnica specifica: **-**

La prestazione del prodotto sopra identificato è conforme all'insieme delle prestazioni dichiarate. La presente dichiarazione di prestazione è emessa, in conformità al regolamento (UE) n. 305/2011, sotto la sola responsabilità del fabbricante sopra identificato.

Firmato a nome e per conto del fabbricante da:



Dr. Ronald Mihala, Responsabile della gestione dello sviluppo e della produzione
Tumlingen, 2025-04-03



Dieter Pfaff, Capo della Federazione Internazionale della Produzione e Gestione della Qualità

Questa Dichiarazione di Prestazione (DoP) è stata preparata in varie lingue. In caso di contestazioni sull'interpretazione, prevarrà sempre la versione inglese.

L'Appendice include informazioni volontarie e complementari in lingua inglese che superano i requisiti di legge (lingua specificata in modo neutrale).

Translation guidance Essential Characteristics and Performance Parameters for Annexes

Guida alla traduzione delle Caratteristiche Essenziali e dei Parametri di Prestazione per gli Annessi

Mechanical resistance and stability (BWR 1)		
Resistenza meccanica e stabilità (BWR 1)		
Characteristic resistance to tension load (static and quasi-static loading):		
Resistenza caratteristica al carico di tensione (carico statico e quasi-statico):		
1	Resistance to steel failure: Resistenza alla rottura dell'acciaio:	$N_{Rk,s}$ [kN]
2	Resistance to combined pull-out and concrete cone failure: Resistenza alla rottura del calcestruzzo combinata con sfilamento:	τ_{Rk} and/or $\tau_{Rk,100}$ [N/mm ²], $\psi_c, \psi_{sus}^0, \psi_{sus,100}$ [-] (BF)
	Resistance to pull-out failure: Resistenza alla rottura per sfilamento:	$N_{Rk,p}$ and/or $N_{Rk,p,100}$ [kN], ψ_c [-] (BEF)
3	Resistance to concrete cone failure: Resistenza alla rottura del cono di calcestruzzo:	$c_{cr,N}$ [mm], $k_{cr,N}$, $k_{ucr,N}$ [-]
4	Edge distance to prevent splitting under load: Distanza dal bordo per evitare lo splitting sotto carico:	$c_{cr,sp}$ [mm]
5	Robustness: Robustezza:	γ_{inst} [-]
6	Maximum installation torque: Massima coppia di installazione:	$\max T_{inst}$ [Nm] (BF)
	Installation torque: Coppia di installazione:	T_{inst} [Nm] (BEF)
7	Minimum edge distance, spacing and member thickness: Distanza dal bordo e interassi minimi, Spessore dell'elemento:	c_{min} , s_{min} , h_{min} [mm]
Characteristic resistance to shear load (static and quasi-static loading):		
Resistenza caratteristica al carico di taglio (carico statico e quasi statico):		
8	Resistance to steel failure: Resistenza alla rottura dell'acciaio:	$V_{Rk,s}^0$ [kN], $M_{Rk,s}^0$ [Nm], k_7 [-]
9	Resistance to pry-out failure: Resistenza alla rottura per pry-out:	k_8 [-]
10	Resistance to concrete edge failure: Resistenza alla rottura del bordo di calcestruzzo:	d_{nom} , l_f [mm]
Displacements under short-term and long-term loading:		
Spostamenti con carichi a breve e a lungo termine:		
11	Displacements factors under short-term and long-term loading: Spostamenti con carichi a breve e a lungo termine:	δ_0 , δ_∞ [mm/(N/mm ²)] or [mm/kN]
12	Resistance in steel fibre reinforced concrete: Resistenza nel calcestruzzo rinforzato con fibre d'acciaio:	Description
Characteristic resistance and displacements for seismic performance categories C1 and C2:		
Resistenza e spostamenti caratteristici per le categorie di prestazione sismica C1 e C2:		
13	Resistance to tension for seismic performance category C1 Resistenza al carico di trazione, categoria C1:	$N_{Rk,s,C1}$ [kN] (all) $\tau_{Rk,C1}$ [N/mm ²] (BF) $N_{Rk,p,C1}$ [kN] (BEF)
14	Resistance to tension and displacements for seismic performance category C2 Resistenza al carico di trazione, categoria C2:	$N_{Rk,s,C2}$ [kN] (all) $\tau_{Rk,C2}$ [N/mm ²] (BF) $N_{Rk,p,C2}$ [kN] (BEF) $\delta_{N,C2(50\%)}$, $\delta_{N,C2(100\%)}$ [mm] (all)
15	Resistance to shear for seismic performance category C1 Resistenza al carico di taglio, categoria C1:	$V_{Rk,s,C1}$ [kN] (all)
16	Resistance to shear load and displacements for seismic performance category C2 Resistenza al carico di taglio, categoria C2:	$V_{Rk,s,C2}$ [kN] (all) $\delta_{V,C2(50\%)}$, $\delta_{V,C2(100\%)}$ [mm] (all)
Safety in case of fire (BWR 2)		
Sicurezza in caso di incendio (BWR 2)		
17	Reaction to fire Reazione al fuoco:	Class Classe (A1)
Resistance to fire		
Resistenza al fuoco:		
18	Fire resistance to steel failure (tension load): Resistenza al fuoco alla rottura dell'acciaio (carico di trazione):	$N_{Rk,s,fi}$ [kN]
19	Bond resistance under fire conditions: Resistenza al legame in condizioni di incendio:	$k_{fi,p}(\theta)$ [-], $\tau_{Rk,fi}(\theta)$ [N/mm ²] (BF)
20	Fire resistance to steel failure under shear loading: Resistenza al fuoco alla rottura dell'acciaio (carico di taglio):	$V_{Rk,s,fi}$ [kN], $M_{Rk,s,fi}^0$ [Nm]
Hygiene, health and the environment (BWR 3)		
Igiene, salute e ambiente (BWR 3)		
21	Content, emission and/or release of dangerous substances: Contenuto, emissione e/o rilascio di sostanze pericolose:	Description/Level

Specific Part

1 Technical description of the product

The "fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1" is a bonded anchor consisting of a cartridge with injection mortar according to Annex A3 and a steel element according to Annex A4.

The steel element is placed into a drilled hole filled with injection mortar and is anchored via the bond between metal part, injection mortar and concrete.

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 B3 to B5, C1 to C6
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C1 to C4
Displacements under short-term and long-term loading	See Annex C7 and C8
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

3.3 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Content, emission and/or release of dangerous substances	No performance assessed

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 330499-02-0601 the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

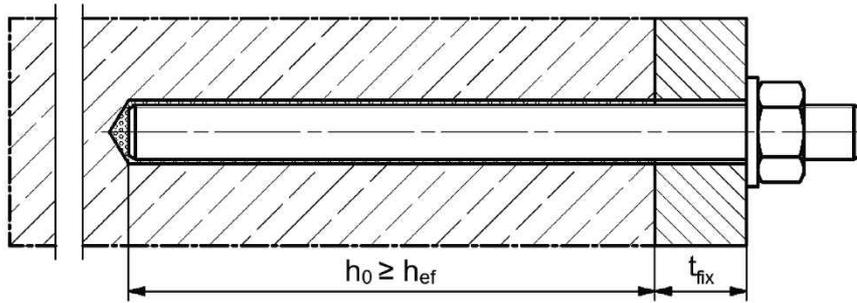
5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

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

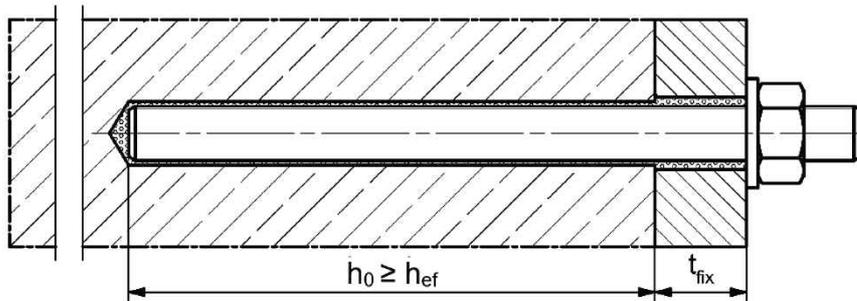
Installation conditions part 1

Anchor rod FIS A / RG M (Anchor rod) and standard threaded rod (Threaded rod)

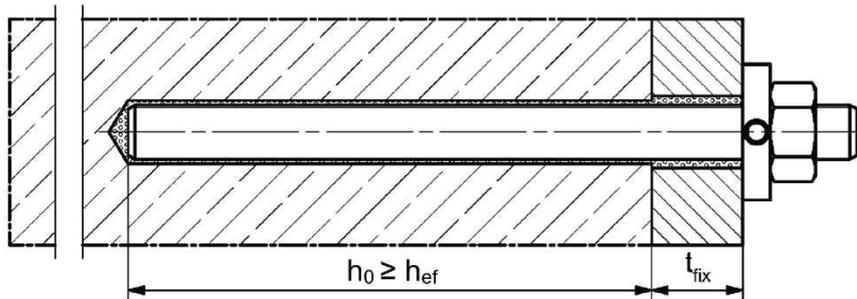
Pre-positioned installation



Push through installation (annular gap filled with mortar)



Pre-positioned or push through installation with subsequently injected fischer filling disc (annular gap filled with mortar)



Figures not to scale

h_0 = drill hole depth

h_{ef} = effective embedment depth

t_{fix} = thickness of fixture

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Product description
Installation conditions part 1

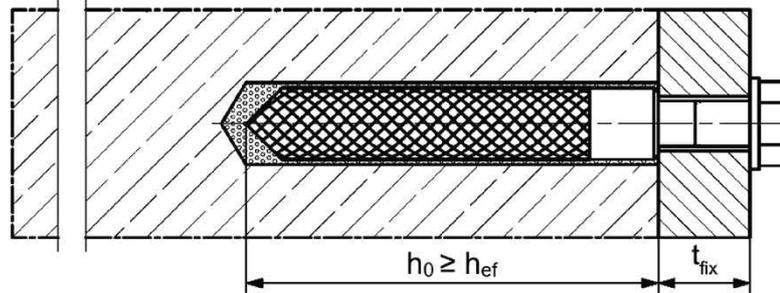
Annex A1

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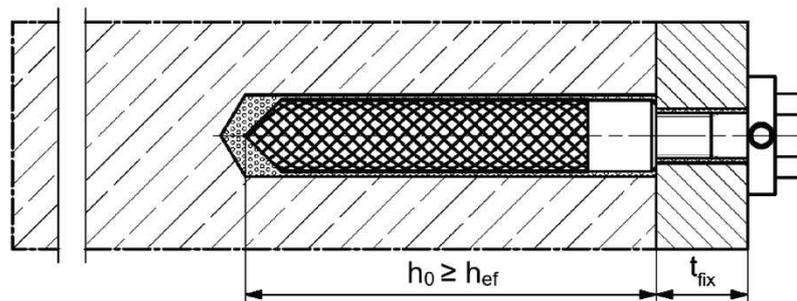
Installation conditions part 2

fischer internal threaded anchor RG M I (fischer RG M I)

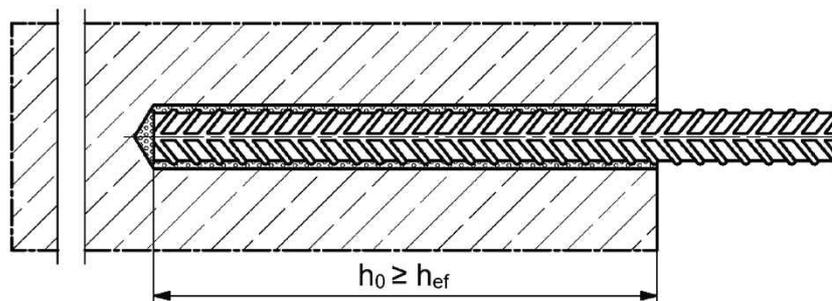
Pre-positioned installation



Pre-positioned installation with subsequently injected fischer filling disc (annular gap filled with mortar)



Reinforcing bar



Figures not to scale

h_0 = drill hole depth

h_{ef} = effective embedment depth

t_{fix} = thickness of fixture

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

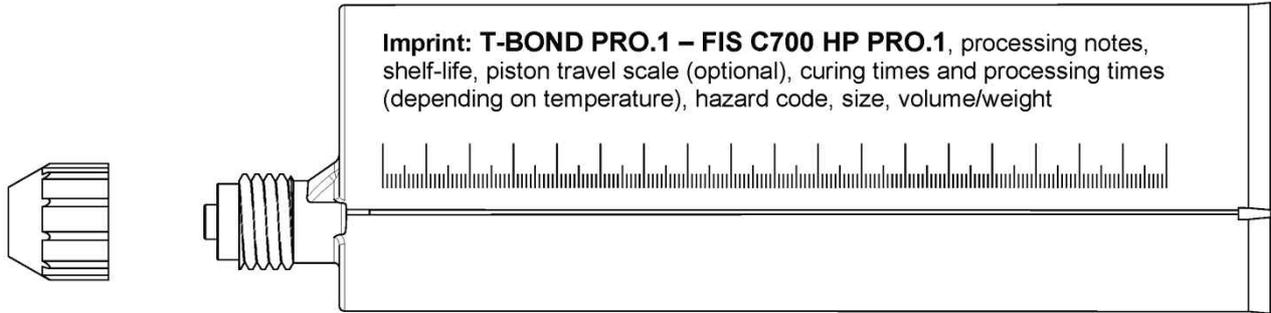
Product description
Installation conditions part 2

Annex A2

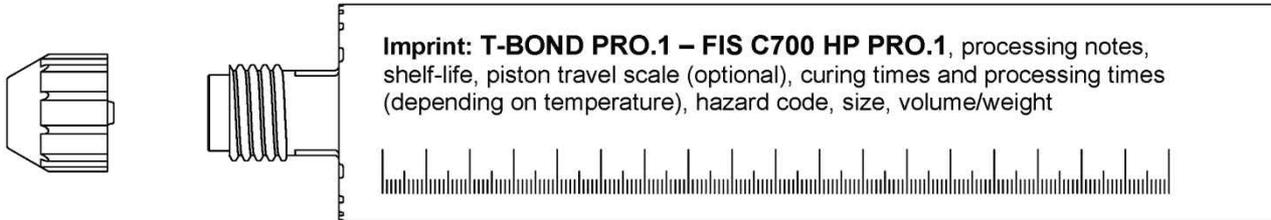
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Overview system components part 1

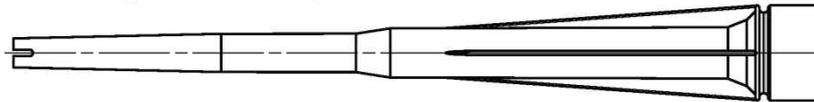
Injection cartridge (shuttle cartridge) with sealing cap; Sizes: 360 ml, 825 ml



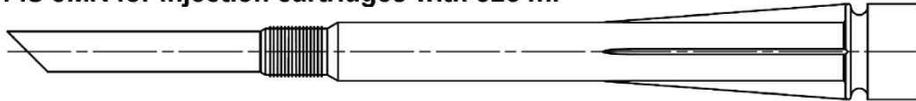
Injection cartridge (coaxial cartridge) with sealing cap; Sizes: 100 ml, 150 ml, 300 ml, 380 ml, 400 ml, 410 ml



Static mixer FIS MR Plus for injection cartridges up to 410 ml



Static mixer FIS JMR for injection cartridges with 825 ml



Injection adapter and extension tube Ø 9 for static mixer FIS MR Plus; Injection adapter and extension tube Ø 9 or Ø 15 for static mixer FIS JMR



Cleaning brush BS



Blow-out pump AB G



Compressed-air cleaning tool APB



Figures not to scale

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Product description

Overview system components part 1;
cartridges / static mixer / accessories

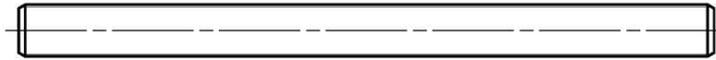
Annex A3

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Overview system components part 2

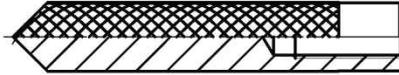
Anchor rod / Threaded rod

Size: M8, M10, M12, M16, M20

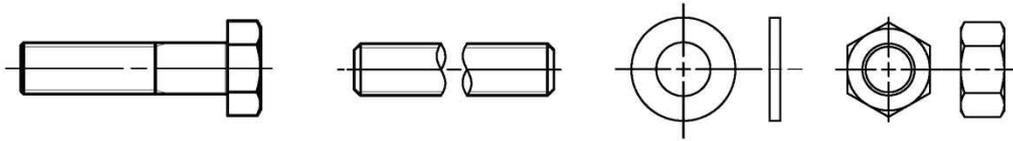


fischer RG M I

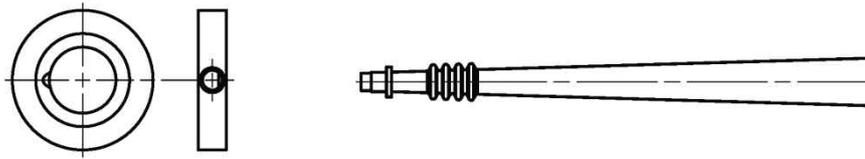
Size: M8, M10, M12, M16, M20



Screw / Threaded rod / washer / hexagon nut



fischer filling disc with injection adapter



Reinforcing bar

Nominal diameter: $\phi 8$, $\phi 10$, $\phi 12$, $\phi 14$, $\phi 16$, $\phi 20$



Figures not to scale

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Product description

Overview system components part 2;
metal parts, injection adapter

Annex A4

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Table A5.1: Materials

Part	Designation	Material		
1	Injection cartridge	Mortar, hardener, filler		
	Steel grade	Steel zinc plated (zp, hdg)	Stainless steel R acc. to EN 10088-1:2023 Corrosion resistance class CRC III acc. to EN 1993-1-4: 2006+A1:2015	High corrosion resistant steel HCR acc. to EN 10088-1:2023 Corrosion resistance class CRC V acc. to EN 1993-1-4: 2006+ A1:2015
2	Anchor rod / Threaded rod	Property class 4.8, 5.8 or 8.8; EN ISO 898-1:2013 electroplated $\geq 5 \mu\text{m}$, EN ISO 4042:2022 or hot dip galvanised $\geq 40 \mu\text{m}$ EN ISO 10684:2004+AC:2009 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$ fracture elongation	Property class 50, 70 or 80 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; 1.4062, 1.4662, 1.4462; EN 10088-1:2023 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$ fracture elongation	Property class 50, 70 or 80 EN ISO 3506-1:2020 or property class HRC 70 with $f_{yk} = 560 \text{ N/mm}^2$; 1.4565; 1.4529; EN 10088-1:2023 $f_{uk} \leq 1000 \text{ N/mm}^2$ $A_5 > 8\%$ fracture elongation
3	Washer ISO 7089:2000	electroplated $\geq 5 \mu\text{m}$, EN ISO 4042:2022 or hot dip galvanised $\geq 40 \mu\text{m}$ EN ISO 10684:2004+AC:2009	1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023	1.4565; 1.4529; EN 10088-1:2023
4	Hexagon nut	Property class 4, 5 or 8 acc. EN ISO 898-2:2022 electroplated $\geq 5 \mu\text{m}$, EN ISO 4042:2022 or hot dip galvanised $\geq 40 \mu\text{m}$ EN ISO 10684:2004+AC:2009	Property class 50, 70 or 80 acc. EN ISO 3506-2:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023	Property class 50, 70 or 80 acc. EN ISO 3506-2:2020 1.4565; 1.4529 EN 10088-1:2023
5	fischer RG M I	Property class 5.8 ISO 898-1:2013 electroplated $\geq 5 \mu\text{m}$, EN ISO 4042:2022	Property class 70 EN ISO 3506-1:2020; 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023	Property class 70 EN ISO 3506-1:2020 1.4565; 1.4529; EN 10088-1:2023
6	Commercial standard screw or threaded rod fischer RG M I	Property class 5.8 or 8.8; EN ISO 898-1:2013 electroplated $\geq 5 \mu\text{m}$, EN ISO 4042:2022 $A_5 > 8\%$ fracture elongation	Property class 70 EN ISO 3506-1:2020 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023 $A_5 > 8\%$ fracture elongation	Property class 70 EN ISO 3506-1:2020 1.4565; 1.4529; EN 10088-1:2023 $A_5 > 8\%$ fracture elongation
7	fischer filling disc	electroplated $\geq 5 \mu\text{m}$, EN ISO 4042:2022 or hot dip galvanised $\geq 40 \mu\text{m}$ EN ISO 10684:2004+AC:2009	1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362; EN 10088-1:2023	1.4565; 1.4529; EN 10088-1:2023
8	Reinforcing bar	EN 1992-1-1:2004 and AC:2010, Annex C Bars and de-coiled rods, class B or C with f_{yk} and k according to NDP or NCI according EN 1992-1-1:2004/NA; $f_{uk} = f_{tk} = k \cdot f_{yk}$ ($A_5 > 8\%$)		

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Product description
Materials

Annex A5
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Specifications of intended use part 1

Table B1.1: Overview use and performance categories

Anchorages subject to		T-BOND PRO.1 – FIS C700 HP PRO.1 with ...					
		Anchor rod / Threaded rod 		fischer Innengewindeanker RG M I 		Reinforcing bar 	
Hammer drilling with standard drill bit 		all sizes					
Hammer drilling with hollow drill bit  (fischer „FHD“, Heller „Duster Expert“; Bosch „Speed Clean“; Hilti „TE-CD, TE-YD“, DreBo „D-Plus“, DreBo „D-Max“)		Nominal drill bit diameter (d ₀) 12 mm to 32 mm					
Static and quasi static loading, in	uncracked concrete	all sizes	Tables: C1.1 C4.1	all sizes	Tables: C2.1 C4.1	all sizes	Tables: C3.1 C4.1
	cracked concrete	M8 to M20	C5.1 C7.1	- ¹⁾	C6.1 C7.2	φ 10 to φ 20	C6.2 C8.1
Seismic performance category	C1	- ¹⁾					
	C2						
Use category	I1 dry or wet concrete	all sizes					
	I2 water filled hole	- ¹⁾					
Installation direction	D3 (downward and horizontal and upwards (e.g. overhead))						
Installation temperature	T _{i,min} = -5 °C to T _{i,max} = +40 °C for the standard variation of temperature after installation						
Service temperature	Temperature range I	-40 °C to +80 °C		(max. short term temperature +80 °C; max. long term temperature +50 °C)			
	Temperature range II	-40 °C to +120 °C		(max. short term temperature +120 °C; max. long term temperature +72 °C)			

¹⁾ Performance not assessed.

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Intended use
Specifications part 1

Annex B1
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Specifications of intended use part 2

Base materials:

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

Use conditions (Environmental conditions):

- Fastener intended for use in structures subject to dry internal conditions (all materials).
- For all other conditions according to EN1993-1-4:2006+A1:2015 corresponding to corrosion resistance classes to Annex A 5 Table 5.1.

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.).
- Fastenings are designed in accordance with:
EN 1992-4:2018.

Installation:

- Fastener installation is to be carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Fastening depth should be marked and adhered to installation.
- Overhead installation is allowed (necessary equipment see installation instruction).

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

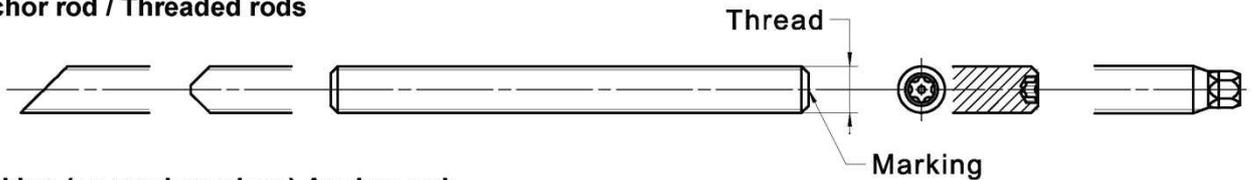
Intended use
Specifications part 2

Annex B2
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Table B3.1: Installation parameters for Anchor rods / Threaded rods

Anchor rods / Threaded rods		Thread	M8	M10	M12	M16	M20
Nominal drill hole diameter	d_0	[mm]	10	12	14	18	24
Drill hole depth	h_0		$h_0 \geq h_{ef}$				
Effective embedment depth	$h_{ef, min}$		60	60	70	80	90
	$h_{ef, max}$		160	200	240	320	400
Minimum spacing and minimum edge distance	s_{min} =		40	45	55	65	85
	c_{min}						
Diameter of the clearance hole of the fixture	pre-positioned installation d_f		9	12	14	18	22
	push through installation d_f		12	14	16	20	26
Minimum thickness of concrete member	h_{min}		$h_{ef} + 30 (\geq 100)$			$h_{ef} + 2d_0$	
Maximum installation torque	$\max T_{inst}$		[Nm]	10	20	40	60

Anchor rod / Threaded rods



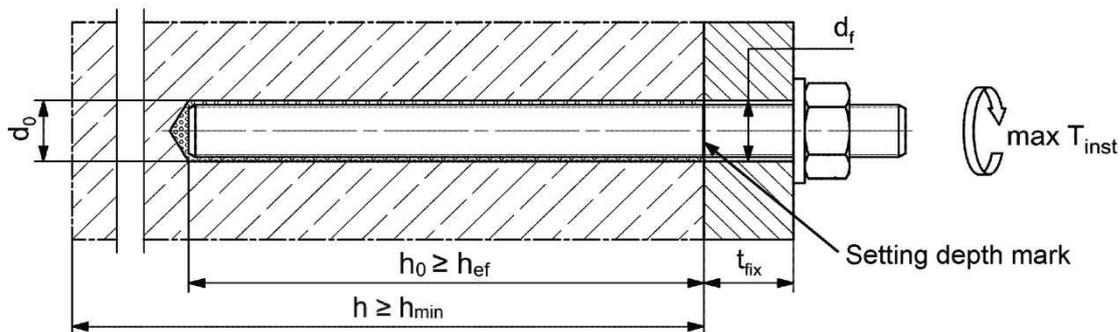
Marking (on random place) Anchor rod:

Steel zinc plated PC ¹⁾ 8.8	• or +	Steel hot-dip PC ¹⁾ 8.8	•
High corrosion resistant steel HCR PC ¹⁾ 50	•	High corrosion resistant steel HCR PC ¹⁾ 70	-
High corrosion resistant steel HCR PC ¹⁾ 80	(Stainless steel R property class 50 ¹⁾	~
Stainless steel R property class 80 ¹⁾	*		

Alternatively: Colour coding according to DIN 976-1: 2016

¹⁾PC = property class

Installation conditions:



Commercial standard threaded rods, washers and hexagon nuts may also be used if the following requirements are fulfilled:

- Materials, dimensions and mechanical properties according to Annex A5, Table A5.1.
- Inspection certificate 3.1 according to EN 10204:2004, the documents have to be stored.
- Setting depth is marked.

Figures not to scale

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

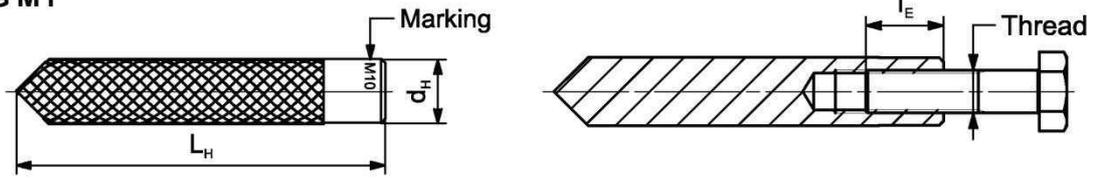
Intended use
Installation parameters Anchor rods / Threaded rods

Annex B3
Appendix 10 / 24

Table B4.1: Installation parameters for fischer RG M I

fischer RG M I		Thread	M8	M10	M12	M16	M20
Diameter of anchor	$d_{nom} = d_H$	[mm]	12	16	18	22	28
Nominal drill hole diameter	d_0		14	18	20	24	32
Drill hole depth	h_0		$h_0 \geq h_{ef} = L_H$				
Effective embedment depth ($h_{ef} = L_H$)	h_{ef}		90	90	125	160	200
Minimum spacing and minimum edge distance	s_{min} = c_{min}		55	65	75	95	125
Diameter of clearance hole in the fixture	d_f		9	12	14	18	22
Minimum thickness of concrete member	h_{min}		120	125	165	205	260
Maximum screw-in depth	$l_{E,max}$		18	23	26	35	45
Minimum screw-in depth	$l_{E,min}$		8	10	12	16	20
Maximum installation torque	$\max T_{inst}$		[Nm]	10	20	40	80

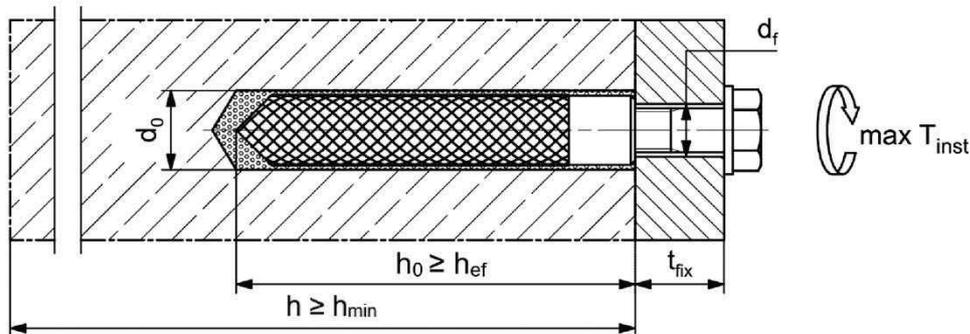
fischer RG M I



Marking: Anchor size e. g.: **M10**
 Stainless steel → additional **R**; e.g.: **M10 R**
 High corrosion resistant steel → additional **HCR**; e.g.: **M10 HCR**

Retaining bolt or threaded rods (including nut and washer) must comply with the appropriate material and strength class of Annex A5, Table A5.1

Installation conditions:



Figures not to scale

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Intended use
 Installation parameters fischer RG M I

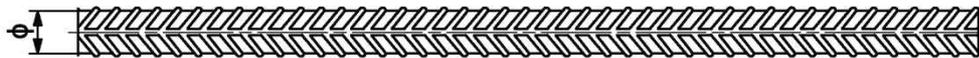
Annex B4
 Appendix 11 / 24

Table B5.1: Installation parameters for reinforcing bars

Nominal diameter of the bar		ϕ	8 ¹⁾		10 ¹⁾		12 ¹⁾		14	16	20
Nominal drill hole diameter	d_0	[mm]	10	12	12	14	14	16	18	20	25
Drill hole depth	h_0		$h_0 \geq h_{ef}$								
Effective embedment depth	$h_{ef,min}$		60	60	70	75	80	90			
	$h_{ef,max}$		160	200	240	280	320	400			
Minimum spacing and minimum edge distance	s_{min} = c_{min}		40	45	55	60	65	85			
Minimum thickness of concrete member	h_{min}	$h_{ef} + 30$ (≥ 100)					$h_{ef} + 2d_0$				

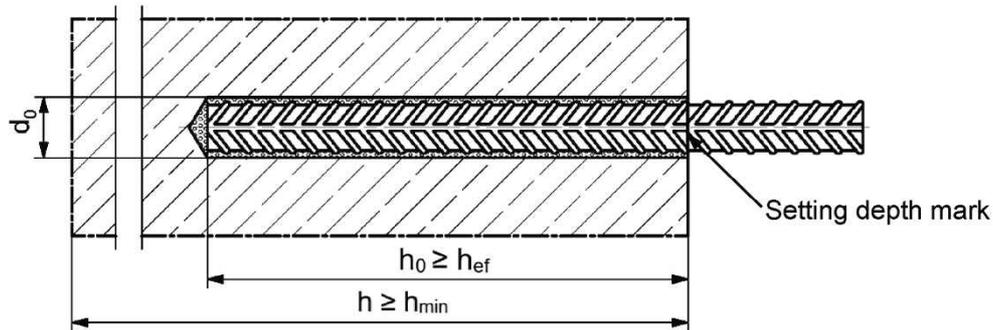
1) Both drill hole diameters can be used

Reinforcing bar



- The minimum value of related rib area $f_{R,min}$ must fulfill the requirements of EN 1992-1-1:2004+AC:2010
- The rib height must be within the range: $0,05 \cdot \phi \leq h_{rib} \leq 0,07 \cdot \phi$
(ϕ = Nominal diameter of the bar, h_{rib} = rib height).

Installation conditions:



Figures not to scale

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Intended use
Installation parameters reinforcing bars

Annex B5
Appendix 12 / 24

Table B6.1: Parameters of the cleaning brush BS (steel brush with steel bristles)

The size of the cleaning brush refers to the drill hole diameter

Nominal drill hole diameter	d_0	[mm]	8	10	12	14	16	18	20	24	25	28	30	32
Steel brush diameter BS	d_b		9	11	14	16	20		25	26	27	30	40	

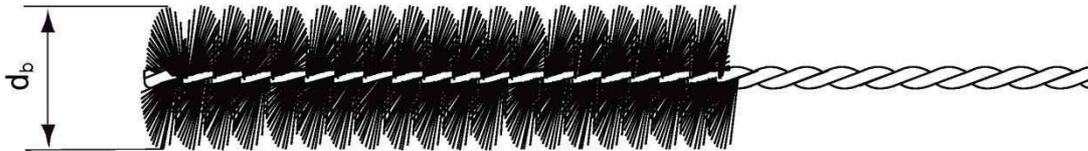


Table B6.2 Maximum processing time of the mortar and minimum curing time (During the curing time of the mortar the concrete temperature may not fall below the listed minimum temperature)

Temperature at anchoring base [°C]	Maximum processing time t_{work}	Minimum curing time ¹⁾ t_{cure}
	T-BOND PRO.1 – FIS C700 HP PRO.1	T-BOND PRO.1 – FIS C700 HP PRO.1
> -5 to 0 ²⁾	>13 min	24 h
> 0 to 5 ²⁾	13 min	3 h
> 5 to 10	9 min	90 min
> 10 to 20	5 min	60 min
> 20 to 30	4 min	45 min
> 30 to 40	2 min	35 min

¹⁾ In wet concrete or water filled holes the curing times must be doubled.

²⁾ Minimal cartridge temperature +5°C.

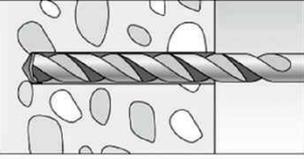
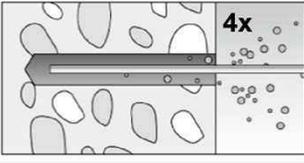
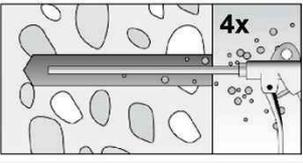
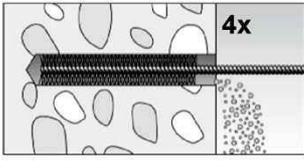
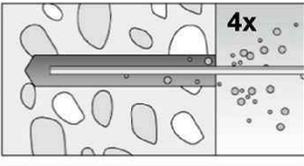
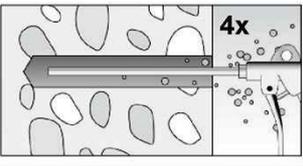
fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Intended use
Cleaning brush (steel brush)
Processing time and curing time

Annex B6
Appendix 13 / 24

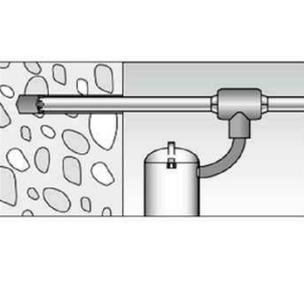
Installation instructions part 1

Drilling and cleaning the hole (hammer drilling with standard drill bit)

1		<p>Drill the hole. Nominal drill hole diameter d_0 and drill hole depth h_0 see Tables B3.1, B4.1, B5.1.</p>
2		 <p>Clean the drill hole: For $h_{ef} \leq 12d$ and $d_0 < 18$ mm blow out the hole four times by hand.</p> <p>For $h_{ef} > 12d$ and / or $d_0 \geq 18$ mm blow out the hole four times with oil-free compressed air ($p \geq 6$ bar).</p>
3		<p>Brush the drill hole four times. For drill hole diameter ≥ 30 mm use a power drill. For deep holes use an extension. Corresponding brushes see Table B6.1</p>
4		 <p>Clean the drill hole: For $h_{ef} \leq 12d$ and $d_0 < 18$ mm blow out the hole four times by hand.</p> <p>For $h_{ef} > 12d$ and / or $d_0 \geq 18$ mm blow out the hole four times with oil-free compressed air ($p \geq 6$ bar).</p>

Go to step 5

Drilling and cleaning the hole (hammer drilling with hollow drill bit)

1		<p>Check a suitable hollow drill (see Table B1.1) for correct operation of the dust extraction.</p>
2		<p>Use a suitable dust extraction system, e.g. fischer FVC 35 M or a comparable dust extraction system with equivalent performance data.</p> <p>Drill the hole with hollow drill bit. The dust extraction system has to extract the drill dust nonstop during the drilling process and must be adjusted to maximum power. Nominal drill hole diameter d_0 and drill hole depth h_0 see Tables B3.1, B4.1, B5.1.</p>

Go to step 5

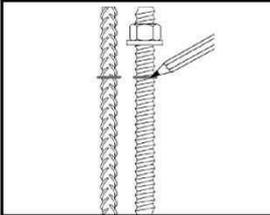
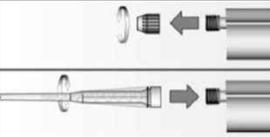
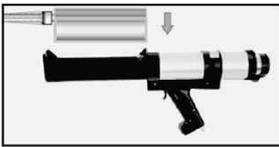
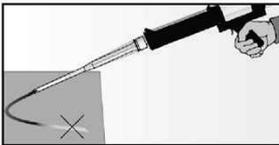
fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Intended use
Installation instructions part 1

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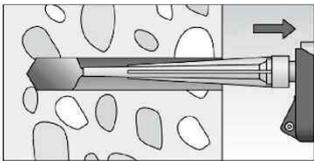
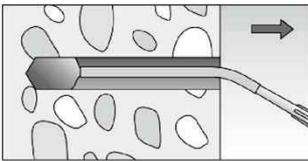
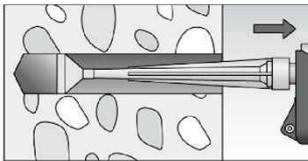
Installation instructions part 2

Preparing the cartridge

5		Mark the setting depth.	
6		<p>Remove the sealing cap. Screw on the static mixer (the spiral in the static mixer must be clearly visible).</p>	
7			Place the cartridge into the dispenser.
8			<p>Extrude approximately 10 cm of material out until the resin is evenly grey in colour. Do not use mortar that is not uniformly grey.</p>

Go to step 9

Injection of the mortar

9	 <p>For $h_0 = h_{ef}$ fill approximately 2/3 of the drill hole with mortar. For $h_0 > h_{ef}$ more mortar is needed. Always begin from the bottom of the hole and avoid bubbles.</p>	 <p>For drill hole depth ≥ 150 mm use an extension tube.</p>	 <p>For overhead installation, deep holes ($h_0 > 250$ mm) use an injection adapter.</p>
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Go to step 10

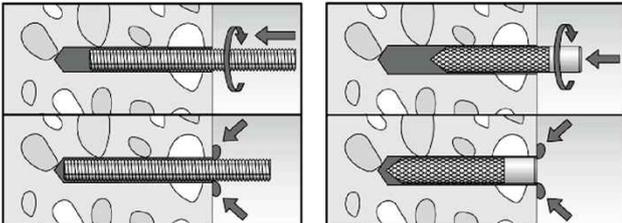
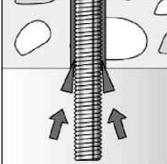
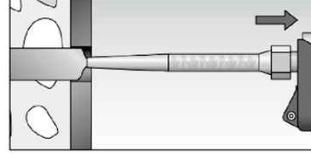
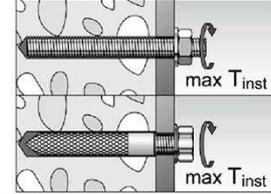
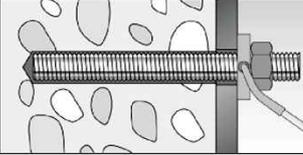
fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Intended use
Installation instructions part 2

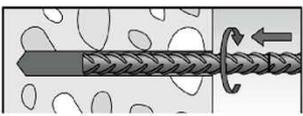
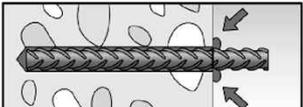
Annex B8
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Installation instructions part 3

Installation of anchor rods or fischer RG M I

10		<p>Only use clean and oil-free metal parts. Push the anchor rod or fischer RG M I anchor down to the bottom of the hole, turning it slightly while doing so. After inserting the metal parts, excess mortar must be emerged around the anchor element. If not, pull out the metal part immediately and reinject mortar.</p>
	 <p>For overhead installations support the metal part with wedges (e.g. centering wedges).</p>	 <p>For push through installation fill the annular gap with mortar</p>
11	 <p>Wait for the specified curing time t_{cure} see Table B6.2.</p>	<p>12</p>  <p>Mounting the fixture max T_{inst} see Tables B3.1 and B4.1.</p>
Option		<p>After the minimum curing time is reached, the gap between metal part and fixture (annular clearance) may be filled with mortar via the filling disc. Compressive strength $\geq 50 \text{ N/mm}^2$ (e.g. fischer T-BOND PRO.1 – FIS C700 HP PRO.1). ATTENTION: By using filling disc reduces t_{fix} (usable length of the anchor).</p>

Installation reinforcing bars

10		<p>Only use clean and oil-free reinforcing bars. Push the reinforcement bar with the setting depth mark into the filled hole up to the setting depth mark. Recommendation: Rotation back and forth of the reinforcement bar makes pushing easy.</p>
10		<p>When the setting depth mark is reached, excess mortar must be emerged from the mouth of the drill hole. If not, pull out the metal part immediately and reinject mortar.</p>
11	 <p>Wait for the specified curing time t_{cure} see Table B6.2.</p>	

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Intended use
Installation instructions part 3

Annex B9
Appendix 16 / 24

Table C1.1: Characteristic resistance to steel failure under tension / shear loading of Anchor rods and Threaded rods

Anchor rod / Threaded rod		M8	M10	M12	M16	M20		
Characteristic resistance to steel failure under tension loading ¹⁾								
Characteristic resistance $N_{Rk,s}$	Steel zinc plated	4.8	[kN]	14,6(13,2)	23,2(21,4)	33,7	62,8	98,0
		5.8		18,3(16,6)	29,0(26,8)	42,1	78,5	122,5
		8.8		29,2(26,5)	46,4(42,8)	67,4	125,6	196,0
	Stainless steel R and high corrosion resistant steel HCR	50		18,3	29,0	42,1	78,5	122,5
		70		25,6	40,6	59,0	109,9	171,5
		80		29,2	46,4	67,4	125,6	196,0
Partial factors ²⁾								
Partial factor $\gamma_{Ms,N}$	Steel zinc plated	4.8	[-]	1,50				
		5.8		1,50				
		8.8		1,50				
	Stainless steel R and high corrosion resistant steel HCR	50		2,86				
		70		1,87 / fischer HCR: 1,50 ³⁾				
		80		1,60				
Characteristic resistance to steel failure under shear loading ¹⁾								
without lever arm								
Characteristic resistance $V_{Rk,s}^0$	Steel zinc plated	4.8	[kN]	8,7(7,9)	13,9(12,8)	20,2	37,6	58,8
		5.8		10,9(9,9)	17,4(16,0)	25,2	47,1	73,5
		8.8		14,6(13,2)	23,2(21,4)	33,7	62,8	98,0
	Stainless steel R and high corrosion resistant steel HCR	50		9,1	14,5	21,0	39,2	61,2
		70		12,8	20,3	29,5	54,9	85,7
		80		14,6	23,2	33,7	62,8	98,0
Ductility factor	k ₇	[-]	1,0					
with lever arm								
Charact. resistance $M_{Rk,s}^0$	Steel zinc plated	4.8	[Nm]	14,9(12,9)	29,9(26,5)	52,3	132,9	259,6
		5.8		18,7(16,1)	37,3(33,2)	65,4	166,2	324,6
		8.8		29,9(25,9)	59,8(53,1)	104,6	265,9	519,3
	Stainless steel R and high corrosion resistant steel HCR	50		18,7	37,3	65,4	166,2	324,6
		70		26,2	52,3	91,5	232,6	454,4
		80		29,9	59,8	104,6	265,9	519,3
Partial factors ²⁾								
Charact. resistance $M_{Rk,s}^0$	Steel zinc plated	4.8	[-]	1,25				
		5.8		1,25				
		8.8		1,25				
	Stainless steel R and high corrosion resistant steel HCR	50		2,38				
		70		1,56 / fischer HCR: 1,25 ³⁾				
		80		1,33				

1) Values in brackets are valid for undersized threaded rods with smaller stress area A_s for hot dip galvanised Threaded rods according to EN ISO 10684:2004+AC:2009.
 2) In absence of other national regulations.
 3) Only admissible for high corrosion resist. steel HCR, with $f_{yk} / f_{uk} \geq 0,8$ and $A_5 > 12 \%$ (e.g. Anchor rods).

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Performances

Characteristic resistance to steel failure under tension / shear loading of Anchor rods and Threaded rods

Annex C1

Appendix 17 / 24

Table C2.1: Characteristic resistance to steel failure under tension / shear loading of fischer RG M I									
fischer RG M I		RG M I	Screw		M8	M10	M12	M16	M20
Characteristic resistance to steel failure under tension loading									
Characteristic resistance with screw	Property class	5.8	5.8	[kN]	18,3	29,0	42,1	78,3	122,4
			8.8		29,2	46,4	67,4	106,7	180,2
	Property class	R-70 / HCR-70	R-70 / commercial standard		25,6	40,6	59,0	109,6	171,3
			HCR-70		25,6	40,6	59,0	109,6	171,3
Partial factors ¹⁾									
Partial factors	Property class	5.8	5.8	[-]	1,50				
			8.8		1,50				
	Property class	R-70 / HCR-70	R-70 / commercial standard		1,87				
			HCR-70		1,50				
Characteristic resistance to steel failure under shear loading									
Without lever arm									
Characteristic resistance with screw	Property class	5.8	5.8	[kN]	10,9	17,4	25,2	47,1	73,5
			8.8		14,6	23,2	33,7	62,8	98,0
	Property class	R-70 / HCR-70	R-70 / commercial standard		12,8	20,3	29,5	54,9	85,7
			HCR-70		12,8	20,3	29,5	54,9	85,7
Ductility factor	k ₇			[-]	1,0				
With lever arm									
Characteristic resistance with screw	Property class	5.8	5.8	[Nm]	18,7	37,3	65,4	166,2	324,6
			8.8		29,9	59,8	104,6	265,9	519,3
	Property class	R-70 / HCR-70	R-70 / commercial standard		26,2	52,3	91,5	232,6	454,4
			HCR-70		26,2	52,3	91,5	232,6	454,4
Partial factors ¹⁾									
Partial factors	Property class	5.8	5.8	[-]	1,25				
			8.8		1,25				
	Property class	R-70 / HCR-70	R-70 / commercial standard		1,56				
			HCR-70		1,25				
¹⁾ In absence of other national regulations.									
fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1								Annex C2 Appendix 18 / 24	
Performances		Characteristic resistance to steel failure under shear loading of fischer RG M I							

Table C3.1: Characteristic resistance to steel failure under tension / shear loading of reinforcing bars

Nominal diameter of the bar	ϕ	8	10	12	14	16	20
Characteristic resistance to steel failure under tension loading							
Characteristic resistance	$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}^{1)}$				
Characteristic resistance to steel failure under shear loading							
Without lever arm							
Characteristic resistance	$V_{Rk,s}^0$	[kN]	$k_6^{2)}) \cdot A_s \cdot f_{uk}^{1)}$				
Ductility factor	k_7	[-]	1,0				
With lever arm							
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	$1,2 \cdot W_{el} \cdot f_{uk}^{1)}$				

- 1) f_{uk} respectively must be taken from the specifications of the reinforcing bar.
 2) In accordance with EN 1992-4:2018 section 7.2.2.3.1.
 $k_6 = 0,6$ for fasteners made of carbon steel with $f_{uk} \leq 500$ N/mm².
 $= 0,5$ for fasteners made of carbon steel with $500 < f_{uk} \leq 1000$ N/mm².
 $= 0,5$ for fasteners made of stainless steel.

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Performances

Characteristic resistance to steel failure under tension / shear loading of reinforcing bars

Annex C3

Appendix 19 / 24

Table C4.1: Characteristic resistance to concrete failure under tension / shear loading

Size		All sizes						
Characteristic resistance to concrete failure under tension loading								
Installation factor	γ_{inst}	[-]	See annex C5 to C6					
Factors for the compressive strength of concrete > C20/25								
Increasing factor ψ_c for cracked or uncracked concrete $\tau_{Rk}(X,Y) = \psi_c \cdot \tau_{Rk}(C20/25)$	C25/30	[-]	1,05					
	C30/37		1,10					
	C35/45		1,15					
	C40/50		1,19					
	C45/55		1,22					
	C50/60		1,26					
Splitting failure								
Edge distance	$h / h_{ef} \geq 2,0$	$C_{cr,sp}$	[mm]	1,0 h_{ef}				
	$2,0 > h / h_{ef} > 1,3$			4,6 h_{ef} - 1,8 h				
	$h / h_{ef} \leq 1,3$			2,26 h_{ef}				
Spacing	$S_{cr,sp}$			2 $C_{cr,sp}$				
Concrete failure								
Uncracked concrete	$k_{ucr,N}$	[-]	11,0					
Cracked concrete	$k_{cr,N}$		7,7					
Edge distance	$C_{cr,N}$	[mm]	1,5 h_{ef}					
Spacing	$S_{cr,N}$		2 $C_{cr,N}$					
Factors for sustained tension loading								
Temperature range			50 °C / 80 °C	72 °C / 120 °C				
Factor	ψ_{sus}^0	[-]	0,74	0,87				
Characteristic resistance to concrete failure under shear loading								
Installation factor	γ_{inst}	[-]	1,0					
Concrete pry-out failure								
Factor for pry-out failure	k_8	[-]	2,0					
Concrete edge failure								
Effective length of fastener in shear loading	l_f	[mm]	for $d_{nom} \leq 24$ mm: min (h_{ef} ; 12 d_{nom}) for $d_{nom} > 24$ mm: min (h_{ef} ; 8 d_{nom} ; 300 mm)					
Calculation diameters								
Size			M8	M10	M12	M16	M20	
Anchor rods and Threaded rods	d_{nom}	[mm]	8	10	12	16	20	
fischer RG M I	d_{nom}		12	16	18	22	28	
Size (nominal diameter of the bar)	ϕ	[mm]	8	10	12	14	16	20
Reinforcing bar	d_{nom}		8	10	12	14	16	20
1) Anchor type not part of this assessment.								

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Performances
Characteristic resistance to concrete failure under tension / shear loading

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Table C5.1: Characteristic resistance to combined pull-out and concrete failure for Anchor rods and Threaded rods in hammer drilled holes; uncracked or cracked concrete

Anchor rod / Threaded rod		M8	M10	M12	M16	M20	
Combined pull-out and concrete cone failure							
Calculation diameter	d [mm]	8	10	12	16	20	
Uncracked concrete							
Characteristic bond resistance in uncracked concrete C20/25							
Hammer-drilling with standard drill bit or hollow drill bit (dry or wet concrete)							
Temperature range	I: 50 °C / 80 °C	$\tau_{Rk,ucr}$ [N/mm ²]	11,0	11,0	11,0	10,0	9,5
	II: 72 °C / 120 °C		9,5	9,5	9,0	8,5	8,0
Installation factors							
Dry or wet concrete	γ_{inst}	[-]	1,2				
Cracked concrete							
Characteristic bond resistance in cracked concrete C20/25							
Hammer-drilling with standard drill bit or hollow drill bit (dry or wet concrete)							
Temperature range	I: 50 °C / 80 °C	$\tau_{Rk,cr}$ [N/mm ²]	- ¹⁾	6,0	6,0	6,0	5,5
	II: 72 °C / 120 °C		- ¹⁾	5,0	6,0	6,0	5,0
Installation factors							
Dry or wet concrete	γ_{inst}	[-]	- ¹⁾	1,2			

¹⁾ Performance not assessed.

fischer Injection system T-BOND PRO.1 – FIS C700 HP PRO.1

Performances

Characteristic resistance to combined pull-out and concrete failure for Anchor rod and Threaded rods

Annex C5

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Table C6.1: Characteristic resistance to combined pull-out and concrete failure for fischer RG M I in hammer drilled holes; uncracked concrete							
fischer RG M I			M8	M10	M12	M16	M20
Combined pull-out and concrete cone failure							
Calculation diameter	d	[mm]	12	16	18	22	28
Uncracked concrete							
Characteristic bond resistance in uncracked concrete C20/25							
Hammer-drilling with standard drill bit or hollow drill bit (dry or wet concrete)							
Temperature range	I: 50 °C / 80 °C	$\tau_{Rk,ucr}$ [N/mm ²]	10,5	10,0	9,5	9,0	8,5
	II: 72 °C / 120 °C		9,0	8,0	8,0	7,5	7,0
Installation factors							
Dry or wet concrete	γ_{inst}	[-]	1,2				

Table C6.2: Characteristic resistance to combined pull-out and concrete failure for reinforcing bars in hammer drilled holes; uncracked or cracked concrete									
Nominal diameter of the bar			ϕ	8	10	12	14	16	20
Combined pull-out and concrete cone failure									
Calculation diameter	d	[mm]	8	10	12	14	16	20	
Uncracked concrete									
Characteristic bond resistance in uncracked concrete C20/25									
Hammer-drilling with standard drill bit or hollow drill bit (dry or wet concrete)									
Temperature range	I: 50 °C / 80 °C	$\tau_{Rk,ucr}$ [N/mm ²]	11,0	11,0	11,0	10,0	10,0	9,5	
	II: 72 °C / 120 °C		9,5	9,5	9,0	8,5	8,5	8,0	
Installation factor									
Dry or wet concrete	γ_{inst}	[-]	1,2						
Cracked concrete									
Characteristic bond resistance in cracked concrete C20/25									
Hammer-drilling with standard drill bit or hollow drill bit (dry or wet concrete)									
Temperature range	I: 50 °C / 80 °C	$\tau_{Rk,cr}$ [N/mm ²]	- ¹⁾	3,0	5,0	5,0	5,0	4,5	
	II: 72 °C / 120 °C		- ¹⁾	3,0	4,5	4,5	4,5	4,0	
Installation factor									
Dry or wet concrete	γ_{inst}	[-]	- ¹⁾	1,2					

¹⁾ Performance not assessed

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Performances	Characteristic resistance to combined pull-out and concrete failure for fischer Threaded RG M I and reinforcing bars	

Table C7.1: Displacements for Anchor rods / Threaded rods

Anchor rods / Threaded rods		M8	M10	M12	M16	M20
Displacement-Factors for tension loading¹⁾						
Uncracked concrete; Temperature range I, II						
δ_{N0} -Factor	[mm/(N/mm ²)]	0,09	0,09	0,10	0,10	0,10
$\delta_{N\infty}$ -Factor		0,10	0,10	0,12	0,12	0,12
Cracked concrete; Temperature range I, II						
δ_{N0} -Factor	[mm/(N/mm ²)]	- ³⁾	0,12	0,12	0,13	0,13
$\delta_{N\infty}$ -Factor		- ³⁾	0,27	0,30	0,30	0,30
Displacement-Factors for shear loading²⁾						
Uncracked or cracked concrete; Temperature range I, II						
δ_{V0} -Factor	[mm/kN]	0,11	0,11	0,10	0,10	0,09
$\delta_{V\infty}$ -Factor		0,12	0,12	0,11	0,11	0,10

1) Calculation of effective displacement:

$$\delta_{N0} = \delta_{N0}\text{-Factor} \cdot \tau$$

$$\delta_{N\infty} = \delta_{N\infty}\text{-Factor} \cdot \tau$$

τ = acting bond strength under tension loading

2) Calculation of effective displacement:

$$\delta_{V0} = \delta_{V0}\text{-Factor} \cdot V$$

$$\delta_{V\infty} = \delta_{V\infty}\text{-Factor} \cdot V$$

V = acting shear loading

³⁾ Performance not assessed

Table C7.2: Displacements for fischer RG M I

fischer RG M I		M8	M10	M12	M16	M20
Displacement-Factors for tension loading¹⁾						
Uncracked concrete; Temperature range I, II						
δ_{N0} -Factor	[mm/(N/mm ²)]	0,10	0,11	0,12	0,13	0,14
$\delta_{N\infty}$ -Factor		0,13	0,14	0,15	0,16	0,18
Displacement-Factors for shear loading²⁾						
Uncracked concrete; Temperature range I, II						
δ_{V0} -Factor	[mm/kN]	0,12	0,12	0,12	0,12	0,12
$\delta_{V\infty}$ -Factor		0,14	0,14	0,14	0,14	0,14

1) Calculation of effective displacement:

$$\delta_{N0} = \delta_{N0}\text{-Factor} \cdot \tau$$

$$\delta_{N\infty} = \delta_{N\infty}\text{-Factor} \cdot \tau$$

τ = acting bond strength under tension loading

2) Calculation of effective displacement:

$$\delta_{V0} = \delta_{V0}\text{-Factor} \cdot V$$

$$\delta_{V\infty} = \delta_{V\infty}\text{-Factor} \cdot V$$

V = acting shear loading

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Performances

Displacements for Anchor rods / Threaded rods and fischer RG M I

Annex C7

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Table C8.1: Displacements for reinforcing bars

Nominal diameter of the bar ϕ		8	10	12	14	16	20
Displacement-Factors for tension loading¹⁾							
Uncracked concrete; Temperature range I, II							
δ_{N0} -Factor	[mm/(N/mm ²)]	0,09	0,09	0,10	0,10	0,10	0,10
$\delta_{N\infty}$ -Factor		0,10	0,10	0,12	0,12	0,12	0,12
Cracked concrete; Temperature range I, II							
δ_{N0} -Factor	[mm/(N/mm ²)]	- ³⁾	0,12	0,13	0,13	0,13	0,13
$\delta_{N\infty}$ -Factor		- ³⁾	0,27	0,30	0,30	0,30	0,30
Displacement-Factors for shear loading²⁾							
Uncracked or cracked concrete; Temperature range I, II							
δ_{V0} -Factor	[mm/kN]	0,11	0,11	0,10	0,10	0,10	0,09
$\delta_{V\infty}$ -Factor		0,12	0,12	0,11	0,11	0,11	0,10

1) Calculation of effective displacement:

$$\delta_{N0} = \delta_{N0}\text{-Factor} \cdot \tau$$

$$\delta_{N\infty} = \delta_{N\infty}\text{-Factor} \cdot \tau$$

τ = acting bond strength under tension loading

2) Calculation of effective displacement:

$$\delta_{V0} = \delta_{V0}\text{-Factor} \cdot V$$

$$\delta_{V\infty} = \delta_{V\infty}\text{-Factor} \cdot V$$

V = acting shear loading

³⁾ Performance not assessed.

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Performances
Displacements for reinforcing bars

Annex C8
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