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European Technical Assessment

ETA 17/0074 of 16/02/2017

English translation prepared by IETcc. Original version in Spanish language

General Part

Technical Assessment Body issuing the ETA designated according to Art. 29 of Regulation (EU) 305/2011:

Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)

Trade name of the construction product

**HFKC (galvanised wedge anchor)
HFKP (stainless steel wedge anchor)**

Product family to which the construction product belongs

Torque controlled expansion anchor made of galvanised steel or stainless steel of sizes M6, M8, M10, M12, M14, M16 and M20 for use in non-cracked concrete.

Manufacturer

**ISIK INSAAT TAAHÜT VE KIMYA
SAN.TIC.LTD.STI.**
Keresteciler Sanayi Sitesi 3 Sokak No.18 Ikitelli,
Basaksehir, Istanbul (Turkey)
website: www.isikinsaatltd.com.tr

Manufacturing plants

ETA Holder plant 1
ETA Holder plant 2

This European Technical Assessment contains

13 pages including 4 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

European Technical Assessment EAD 330232-00-0601 "Mechanical Fasteners for use in concrete", ed. October 2016

English translation prepared by IETcc

This European Technical Assessment is issued by IETcc in its official language. Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

This European Technical Assessment may be withdrawn by the issuing Technical Assessment Body, in particular pursuant to information by the Commission according to article 25 (3) of Regulation (EU) No 305/2011.

SPECIFIC PART

1. Technical description of the product

The Isik HFKC / HFKP in the range of M6, M8, M10, M12, M14, M16 and M20 is an anchor made of galvanised steel or stainless steel respectively. The anchor is installed into a predrilled cylindrical hole and anchored by torque-controlled expansion. The anchorage is characterised by friction between expansion clip and concrete.

Product and 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 to 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
HFKC product performance for static or quasi static actions	See annex C
HFKP product performance for static or quasi static actions	See annex D

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorage satisfy requirements for class A1
Resistance to fire	No performance determined

3.3 Hygiene, health and the environment (BWR 3)

This requirement is not relevant for the anchors.

3.4 Safety in use (BWR 4)

The essential characteristics regarding safety in use are included under the basic works requirements Mechanical resistance and stability.

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3.5 Protection against noise (BWR 5)

This requirement is not relevant for the anchors.

3.6 Energy economy and heat retention (BWR 6)

This requirement is not relevant for the anchors.

3.7 Sustainable use of natural resources (BWR 7)

No performance determined

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

The applicable European legal act for the system of Assessment and Verification of Constancy of Performances (see annex V to Regulation (EU) No 305/2011) 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.

The technical details necessary for the implementation of the AVCP system are laid down in the quality plan deposited at Instituto de ciencias de la construcción Eduardo Torroja.



Instituto de ciencias de la construcción Eduardo Torroja
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On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja
Madrid, 16th of February 2017

Marta M^a Castellote Armero
Director

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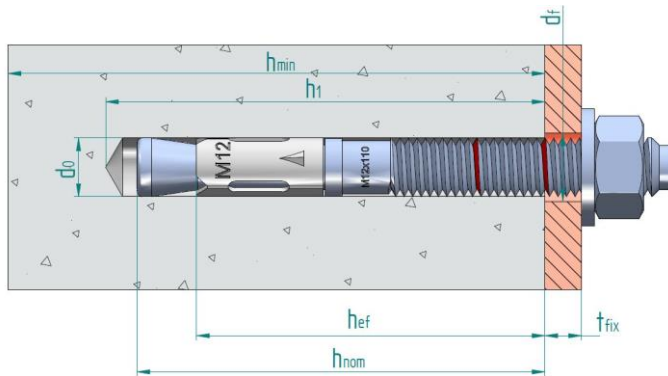
Product and installed condition

HFKC, HFKP anchor

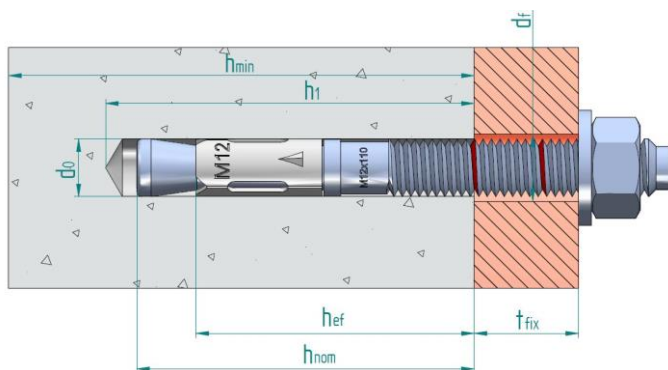


Identification on anchor:

- Expansion clip:
 - Anchor HFKC: Company logo + "HFKC" + Metric.
 - Anchor HFKP: Company logo + "HFKP" + Metric.
- Anchor body: Metric x Length
- Red ring marks to show embedment depths



Standard embedment depth



Reduced embedment depth (M8, M10 and M12)

- d₀: Nominal diameter of drill bit
- d_f: Fixture clearance hole diameter
- h_{ef}: Effective anchorage depth
- h₁: Depth of drilled hole
- h_{nom}: Overall anchor embedment depth in the concrete
- h_{min}: Minimum thickness of concrete member
- t_{fix}: Fixture thickness

HFKC, HFKP anchor	Annex A1
Product description	
Installed condition	

English translation prepared by IETcc

Table A1: materials

Item	Designation	Material for HFKC	Material for HFKP
1	Anchor Body	Carbon steel wire rod, galvanised $\geq 5 \mu\text{m}$ ISO 4042 A2, cold forged	Stainless steel, grade A4
2	Washer	DIN 125, DIN 9021 or DIN 440 galvanised $\geq 5 \mu\text{m}$ ISO 4042 A2	DIN 125, DIN 9021 or DIN 440, stainless steel grade A4
3	Nut	DIN 934 galvanised $\geq 5 \mu\text{m}$ ISO 4042 A2, class 6	DIN 934, stainless steel grade A4
4	Expansion clip	Carbon steel strip, galvanised $\geq 5 \mu\text{m}$ ISO 4042 A2	Stainless steel, grade A4

HFKC, HFKP anchor	Annex A2
Product description	
Materials	

Intended use

Anchorage subjected to:

- Static or quasi static loads, all sizes and embedment depths

Base materials:

- Reinforced and unreinforced concrete according to EN 206-1
- Strength classes C20/25 to C50/60 according to EN 206-1
- Uncracked concrete

Use conditions (environmental conditions):

- The anchor shall only be used in dry internal conditions: all anchor types
- Structural subjected to external atmospheric exposure (including industrial and marine environment) and to permanent internal conditions with no particular aggressive conditions exists: screw types made of stainless steel with marking A4. Such particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete.
- Verifiable calculation rules and drawings are prepared taking into account of the loads to be attached. The position of the anchor is indicated on the design drawings (e.g. position of the anchor relative to reinforcement or to supports, etc.)
- Anchorages under static or quasi-static are designed for design Method A in accordance with:
 - ETAG 001, Annex C, edition August 2010 or
 - CEN/TS 1992-4:2009

Installation:

- Hammer drilling only.
- Anchor installation carried out by appropriately qualified personal and under the supervision of the person responsible for technical matters of the site.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of aborted hole or smaller distance if the aborted hole is filled with high strength mortar and if under shear or oblique tension load it is not the direction of the load application.

HFKC, HFKP anchor	Annex B1
Intended use	
Specifications	

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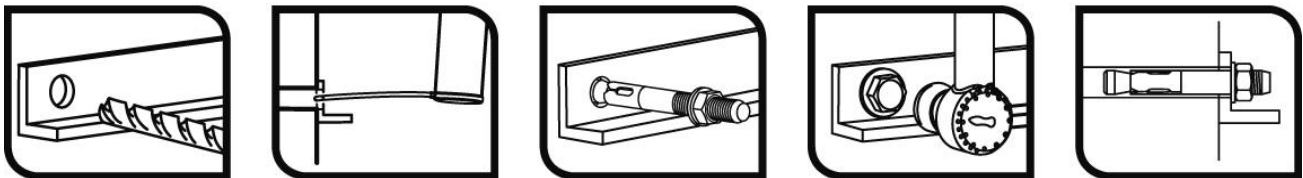
Table C1: Installation parameters for HFKC anchor

HFKC: GALVANISED ANCHOR Installation parameters		Performances							
		M6	M8	M10	M12	M14	M16	M20	
d_0	Nominal diameter of drill bit:	[mm]	6	8	10	12	14	16	20
d_f	Fixture clearance hole diameter:	[mm]	7	9	12	14	16	18	22
T_{inst}	Nominal installation torque:	[Nm]	7	20	35	60	90	120	240
Standard embedment depth									
L_{min}	Total length of the bolt:	[mm]	60	75	85	100	120	125	160
L_{max}		[mm]	180	155	230	250	250	280	270
h_{min}	Minimum thickness of concrete member:	[mm]	100	100	110	130	150	168	206
h_1	Depth of drilled hole:	[mm]	55	65	75	85	100	110	135
h_{nom}	Overall anchor embed depth in concrete:	[mm]	49.5	59.5	66.5	77	91	103.5	125
$h_{ef, std}$	Effective anchorage depth:	[mm]	40	48	55	65	75	84	103
t_{fix}	Thickness of fixture for DIN 125 washer ²⁾ :	[mm]	L-58	L-70	L-80	L-92	L-108	L-122	L-147
t_{fix}	Thickness of fixture for DIN 9021 or DIN 440 washer ²⁾ :	[mm]	L-58	L-71	L-80	L-94	L-108	L-124	L-149
s_{min}	Minimum allowable spacing:	[mm]	50	65	70	85	100	110	135
c_{min}	Minimum allowable distance:	[mm]	50	65	70	85	100	110	135
Reduced embedment depth									
L_{min}	Total length of the bolt:	[mm]	--	60	70	80	--	--	--
L_{max}		[mm]	--	155	230	250	--	--	--
h_{min}	Minimum thickness of concrete member:	[mm]	--	100	100	100	--	--	--
h_1	Depth of drilled hole:	[mm]	--	50	60	70	--	--	--
h_{nom}	Overall anchor embed depth in concrete:	[mm]	--	46.5	53.5	62	--	--	--
$h_{ef, red}$	Effective anchorage depth:	[mm]	--	35 ¹⁾	42	50	--	--	--
t_{fix}	Thickness of fixture for DIN 125 washer ²⁾ :	[mm]	--	L-57	L-67	L-77	--	--	--
t_{fix}	Thickness of fixture for DIN 9021 or DIN 440 washer ²⁾ :	[mm]	--	L-58	L-67	L-79	--	--	--
s_{min}	Minimum allowable spacing:	[mm]	--	65	70	85	--	--	--
c_{min}	Minimum allowable distance:	[mm]	--	65	70	85	--	--	--

¹⁾ Use restricted to anchoring of structural components which are statically indeterminate

²⁾ L= total anchor length

Installation process



HFKC anchor

Performances

Installation parameters and installation procedure

Annex C1

English translation prepared by IETcc

Table C2: Characteristic values to tension loads of design method A according to ETAG 001, Annex C or CEN/TS 1992-4 for HFKC anchor

HFKC: GALVANISED ANCHOR			Performances						
			M6	M8	M10	M12	M14	M16	M20
STEEL FAILURE									
N_R	Characteristic resistance:	[kN]	7.7	16.4	25.6	35.4	51.7	65.0	104.4
$\gamma_{M,s}$	Partial safety factor:	[-]	1.40	1.40	1.40	1.43	1.43	1.43	1.47
PULL OUT FAILURE									
Standard embedment depth									
$N_{Rk,p}$	Characteristic resistance in C20/25 uncracked concrete:	[kN]	-- ³⁾	12	16	25	30	35	50
$\gamma_{2}^{2)}$ $\gamma_{ins}^{1)}$	Installation safety factor:	[-]	--	1.0	1.2	1.2	1.2	1.2	1.2
Reduced embedment depth									
$N_{Rk,p}$	Characteristic resistance in C20/25 uncracked concrete:	[kN]	-- ³⁾	9 ⁴⁾	12	16	--	--	--
$\gamma_{2}^{2)}$ $\gamma_{ins}^{1)}$	Installation safety factor:	[-]	--	1.0	1.0	1.0	--	--	--
Ψ_c	Increasing factors for $N_{Rk,c}^0$:	C30/37	1.22						
		C40/50	1.41						
		C50/60	1.55						
CONCRETE CONE FAILURE AND SPLITTING FAILURE									
Standard embedment depth									
$h_{ef, std}$	Effective anchorage depth:	[mm]	40	48	55	65	75	84	103
$k_{ucr}^{1)}$	Factor for uncracked concrete:	[-]	10.1						
$\gamma_{2}^{2)}$ $\gamma_{ins}^{1)}$	Installation safety factor:	[-]	1.0	1.0	1.2	1.2	1.2	1.2	1.2
$S_{cr,N}$	Concrete cone failure:	[mm]	3 x h_{ef}						
$C_{cr,N}$		[mm]	1.5 x h_{ef}						
$S_{cr, sp}$	Splitting failure:	[mm]	160	192	220	260	300	336	412
$C_{cr, sp}$		[mm]	80	96	110	130	150	168	206
Reduced embedment depth									
$h_{ef, std}$	Effective anchorage depth:	[mm]	--	35 ⁴⁾	42	50	--	--	--
$k_{ucr}^{1)}$	Factor for uncracked concrete:	[-]	10.1						
$\gamma_{2}^{2)}$ $\gamma_{ins}^{1)}$	Installation safety factor:	[-]	--	1.0	1.0	1.0	--	--	--
$S_{cr,N}$	Concrete cone failure	[mm]	--	3 x h_{ef}			--	--	--
$C_{cr,N}$		[mm]	--	1.5 x h_{ef}			--	--	--
$S_{cr, sp}$	Splitting failure:	[mm]	--	140	168	200	--	--	--
$C_{cr, sp}$		[mm]	--	70	84	100	--	--	--

¹⁾ Parameter relevant only for design according to CEN/TS 1992-4:2009

²⁾ Parameter relevant only for design according to ETAG 001, Annex C

³⁾ Pull out failure is not decisive

⁴⁾ Use restricted to anchoring of structural components which are statically indeterminate

HFKC anchor	Annex C2
Performances	
Characteristic values for tension loads	

Table C3: Characteristic values to shear loads of design method A according to ETAG 001, Annex C or CEN/TS 1992- for HFKC anchor

HFKC: GALVANISED ANCHOR		Performances								
		M6	M8	M10	M12	M14	M16	M20		
STEEL FAILURE WITHOUT LEVER ARM										
$V_{Rk,s}$	Characteristic resistance:	[kN]	5.1	9.3	14.7	20.6	28.1	38.4	56.3	
$\gamma_{M,s}$	Partial safety factor:	[-]	1.25							
STEEL FAILURE WITH LEVER ARM										
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	7.7	19.1	38.1	64.1	102.2	163.1	298.5	
$\gamma_{M,s}$	Partial safety factor:	[-]	1.25							
CONCRETE PRYOUT FAILURE										
$k^{(2)}$	k factor:	for $h_{ef,std}$	[-]	1.0	1.0	1.0	2.0	2.0	2.0	2.0
$k_3^{(1)}$		for $h_{ef,red}$	[-]	--	1.0	1.0	1.0	--	--	--
$\gamma_{ins}^{(2)}$	Installation safety factor:	[-]	1.0							
CONCRETE EDGE FAILURE										
l_f	Effective length of anchor:	for $h_{ef,std}$	[mm]	40	48	55	65	75	84	103
		for $h_{ef,red}$	[mm]	--	35 ³⁾	42	50	--	--	--
d_{nom}	Outside diameter of anchor:	[mm]	6	8	10	12	14	16	20	
$\gamma_{ins}^{(2)}$	Installation safety factor:	[-]	1.0							

¹⁾ Parameter relevant only for design according to CEN/TS 1992-4:2009

²⁾ Parameter relevant only for design according to ETAG 001, Annex C

³⁾ Use restricted to anchoring of structural components which are statically indeterminate

Table C4: Displacements under tension load for HFKC

HFKC: GALVANISED ANCHOR		Performances							
		M6	M8	M10	M12	M14	M16	M20	
Standard embedment depth									
	Tension load in non cracked concrete:	[kN]	2.8	5.0	6.0	9.3	10.7	16.0	17.0
δ_{N0}	Displacement:	[mm]	0.70	1.12	1.07	1.32	1.82	2.38	3.56
$\delta_{N\infty}$		[mm]	1.47	2.34	2.24	2.77	3.82	4.99	7.47
Reduced embedment depth									
	Tension load in non cracked concrete:	[kN]	--	4.2	5.7	7.6	--	--	--
δ_{N0}	Displacement:	[mm]	--	0.20	0.13	0.06	--	--	--
$\delta_{N\infty}$		[mm]	--	1.78	1.78	1.78	--	--	--

Table C5: Displacements under shear load for HFKC

HFKC: GALVANISED ANCHOR		Performances							
		M6	M8	M10	M12	M14	M16	M20	
Standard embedment depth									
	Shear load in non cracked concrete:	[kN]	2.9	5.3	8.4	11.8	16.0	21.9	32.1
δ_{V0}	Displacement:	[mm]	0.65	2.80	1.75	2.45	2.78	3.53	4.13
$\delta_{V\infty}$		[mm]	0.98	4.20	2.63	3.68	4.16	5.29	6.19
Reduced embedment depth									
	Shear load in non cracked concrete:	[kN]	--	5.3	8.4	11.8	--	--	--
δ_{V0}	Displacement:	[mm]	--	0.59	1.22	1.10	--	--	--
$\delta_{V\infty}$		[mm]	--	0.89	1.83	1.65	--	--	--

HFKC anchor	Annex C3
Performances	
Characteristic values for shear load. Displacements under tension and shear	

English translation prepared by IETcc

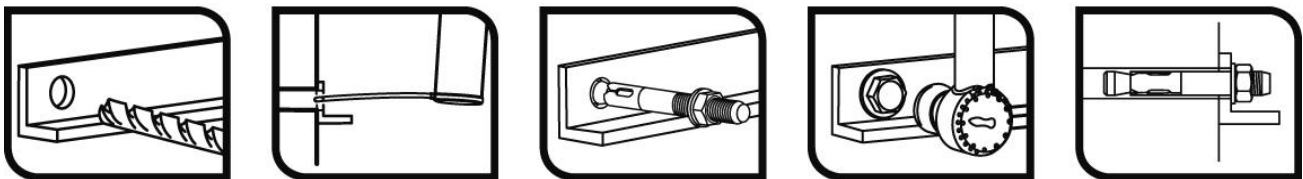
Table D1: Installation parameters for HFKP anchor

HFKP: STAINLESS STEEL ANCHOR Installation parameters		Performances					
		M6	M8	M10	M12	M16	M20
d_0	Nominal diameter of drill bit: [mm]	6	8	10	12	16	20
d_f	Fixture clearance hole diameter: [mm]	7	9	12	14	18	22
T_{inst}	Nominal installation torque: [Nm]	7	20	35	60	120	240
Standard embedment depth							
L_{min}	Total length of the bolt: [mm]	60	75	85	100	125	160
L_{max}		180	155	170	180	170	220
h_{min}	Minimum thickness of concrete member: [mm]	100	100	110	130	168	206
h_1	Depth of drilled hole: [mm]	55	65	75	85	110	135
h_{nom}	Overall anchor embed depth in concrete: [mm]	49.5	59.5	66.5	77	103.5	125
$h_{ef, std}$	Effective anchorage depth: [mm]	40	48	55	65	84	103
t_{fix}	Thickness of fixture for DIN 125 washer ²⁾ : [mm]	L-58	L-70	L-80	L-92	L-108	L-122
t_{fix}	Thickness of fixture for DIN 9021 or DIN 440 washer ²⁾ : [mm]	L-58	L-71	L-80	L-94	L-108	L-124
s_{min}	Minimum allowable spacing: [mm]	50	65	70	85	110	135
c_{min}	Minimum allowable distance: [mm]	50	65	70	85	110	135
Reduced embedment depth							
L_{min}	Total length of the bolt: [mm]	--	60	70	80	--	--
L_{max}		--	155	170	180	--	--
h_{min}	Minimum thickness of concrete member: [mm]	--	100	100	100	--	--
h_1	Depth of drilled hole: [mm]	--	50	60	70	--	--
h_{nom}	Overall anchor embed depth in concrete: [mm]	--	46.5	53.5	62	--	--
$h_{ef, red}$	Effective anchorage depth: [mm]	--	35 ¹⁾	42	50	--	--
t_{fix}	Thickness of fixture for DIN 125 washer ²⁾ : [mm]	--	L-57	L-67	L-77	--	--
t_{fix}	Thickness of fixture for DIN 9021 or DIN 440 washers ²⁾ : [mm]	--	L-58	L-67	L-79	--	--
s_{min}	Minimum allowable spacing: [mm]	--	65	70	85	--	--
c_{min}	Minimum allowable distance: [mm]	--	65	70	85	--	--

¹⁾ Use restricted to anchoring of structural components which are statically indeterminate

²⁾ L= total anchor length

Installation process



HFKP anchor

Performances

Installation parameters and installation procedure

Annex D1

English translation prepared by IETcc

Table D2: Characteristic values to tension loads of design method A according to ETAG 001, Annex C or CEN/TS 1992-4 for HFKP anchor

HFKP: STAINLESS STEEL ANCHOR		Performances						
		M6	M8	M10	M12	M16	M20	
STEEL FAILURE								
$N_{Rk,s}$	Characteristic resistance:	[kN]	10.1	19.1	34.3	49.6	85.9	140.7
$\gamma_{M,s}$	Partial safety factor:	[-]	1.68					
PULL OUT FAILURE								
Standard embedment depth								
$N_{Rk,p}$	Characteristic resistance in C20/25 uncracked concrete:	[kN]	-- ³⁾	12	16	25	35	50
$\gamma_{ins}^{(2)}$ $\gamma_{ins}^{(1)}$	Installation safety factor:	[-]	--	1.0	1.2	1.2	1.2	1.2
Reduced embedment depth								
$N_{Rk,p}$	Characteristic resistance in C20/25 uncracked concrete:	[kN]	--	9 ⁴⁾	12	16	--	--
$\gamma_{ins}^{(2)}$ $\gamma_{ins}^{(1)}$	Installation safety factor:	[-]	--	1.2	1.2	1.2	--	--
Ψ_c	Increasing factors for $N_{Rk,c}^0$:	C30/37	1.22					
		C40/50	1.41					
		C50/60	1.55					
CONCRETE CONE FAILURE AND SPLITTING FAILURE								
Standard embedment depth								
$h_{ef, std}$	Effective anchorage depth:	[mm]	40	48	55	65	84	103
$k_{ucr}^{(1)}$	Factor for uncracked concrete:	[-]	10.1					
$\gamma_{ins}^{(2)}$ $\gamma_{ins}^{(1)}$	Installation safety factor:	[-]	1.0	1.0	1.2	1.2	1.2	1.2
$S_{cr, N}$	Concrete cone failure:	[mm]	3 x h_{ef}					
$C_{cr, N}$		[mm]	1.5 x h_{ef}					
$S_{cr, sp}$	Splitting failure:	[mm]	160	192	220	260	336	412
$C_{cr, sp}$		[mm]	80	96	110	130	168	206
Reduced embedment depth								
$h_{ef, std}$	Effective anchorage depth:	[mm]	--	35 ⁴⁾	42	50	--	--
$k_{ucr}^{(1)}$	Factor for uncracked concrete:	[-]	10.1					
$\gamma_{ins}^{(2)}$ $\gamma_{ins}^{(1)}$	Installation safety factor:	[-]	--	1.2	1.2	1.2	--	--
$S_{cr, N}$	Concrete cone failure:	[mm]	--	3 x h_{ef}			--	--
$C_{cr, N}$		[mm]	--	1.5 x h_{ef}			--	--
$S_{cr, sp}$	Splitting failure:	[mm]	--	140	168	200	--	--
$C_{cr, sp}$		[mm]	--	70	84	100	--	-

¹⁾ Parameter relevant only for design according to CEN/TS 1992-4:2009

²⁾ Parameter relevant only for design according to ETAG 001, Annex C

³⁾ Pull out failure is not decisive

⁴⁾ Use restricted to anchoring of structural components which are statically indeterminate

HFKP anchor

Performances

Characteristic values for tension load.

Annex D2

English translation prepared by IETcc

Table D3: Characteristic values to shear loads of design method A according to ETAG 001, Annex C or CEN/TS 1992- for HFKP anchor

HFKP: STAINLESS STEEL ANCHOR		Performances							
		M6	M8	M10	M12	M16	M20		
STEEL FAILURE WITHOUT LEVER ARM									
$V_{Rk,s}$	Characteristic resistance:	[kN]	6.0	10.9	17.4	25.2	47.1	73.5	
$\gamma_{M,s}$	Partial safety factor	[-]	1.52						
STEEL FAILURE WITH LEVER ARM									
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	9.2	22.5	44.9	78.6	200	389	
$\gamma_{M,s}$	Partial safety factor:	[-]	1.52						
CONCRETE PRYOUT FAILURE									
$k^{(2)}$	k factor:	for $h_{ef,std}$	[-]	1.0	1.0	1.0	2.0	2.0	2.0
$k^{(1)}$		for $h_{ef,red}$	[-]	--	1.0 ¹⁾	1.0	1.0	--	--
$\gamma_{ins}^{(2)}$ $\gamma_{ins}^{(1)}$	Installation safety factor:	[-]	1.0						
CONCRETE EDGE FAILURE									
l_f	Effective length of anchor under shear loads:	for $h_{ef,std}$	[mm]	40	48	55	65	84	103
		for $h_{ef,red}$	[mm]	--	35 ³⁾	42	50	--	--
d_{nom}	Outside diameter of anchor:	[mm]	6	8	10	12	16	20	
$\gamma_{ins}^{(2)}$ $\gamma_{ins}^{(1)}$	Installation safety factor:	[-]	1.0						

¹⁾ Parameter relevant only for design according to CEN/TS 1992-4:2009

²⁾ Parameter relevant only for design according to ETAG 001, Annex C

³⁾ Use restricted to anchoring of structural components which are statically indeterminate

Table D4: Displacements under tension load for HFKP

HFKP: STAINLESS STEEL ANCHOR		Performances						
		M6	M8	M10	M12	M16	M20	
Standard embedment depth								
	Tension load in non cracked concrete:	[kN]	4.3	5.7	6.3	9.9	13,8	19.8
δ_{N0}	Displacement:	[mm]	0.42	0.22	0.17	0.19	0.19	0.11
$\delta_{N\infty}$		[mm]	1.33	1.33	1.33	1.33	1.33	1.33
Reduced embedment depth								
	Tension load in non cracked concrete:	[kN]	--	4.2	5.7	7.6	--	--
δ_{N0}	Displacement:	[mm]	--	0.07	0.04	0.32	--	--
$\delta_{N\infty}$		[mm]	--	0.60	0.60	0.60	--	--

Table D5: Displacements under shear load for HFKP

HFKP: STAINLESS STEEL ANCHOR		Performances						
		M6	M8	M10	M12	M16	M20	
Standard embedment depth								
	Shear load in non cracked concrete:	[kN]	2.8	5.1	8.1	11.8	22.1	34.5
δ_{V0}	Displacement:	[mm]	1.66	1.79	3.83	4.13	5.75	6.59
$\delta_{V\infty}$		[mm]	2.49	2.68	5.74	6.19	8.62	9.88
Reduced embedment depth								
	Shear load in non cracked concrete:	[kN]	--	5.1	8.1	11.8	--	--
δ_{V0}	Displacement:	[mm]	--	0.60	3.83	4.13	--	--
$\delta_{V\infty}$		[mm]	--	0.90	5.74	6.19	--	--

HFKP anchor

Performances

Characteristic values for shear load.
Displacements under tension and shear

Annex D3