TOIMIVUSDEKLARATSIOON

No: 18-EUS [ET]

Tootetüübi kordumatu identifitseerimiskood:

ESSVE Betoonikruvi EUS (carbon steel)

Tootja:

ESSVE Produkter AB
BOX 7091
164 07 Kista
Sweden

Euroopa tehniline hinnang (ETA)	Intended use	Välisläbimõõt ja (külviku) mõõt [mm]	Material	Artikli number
ETA-18/1064 (2019-01-28)	Single anchor or anchor groups for use in structural applications under static or quasi-static actions in cracked and uncracked concrete. ○ Reinforced or unreinforced normal weight concrete according to EN 206-1 ○ Concrete strength classes C20/25 to C50/60 according to EN 206-1	7,5(6)	Carbon steel, tsingitud / RUSPERT	All article numbers in the product group are covered by the ETA.
		10,5(8)		
		12,5(10)		
		16,5(14)		

Euroopa tehniline hinnang (ETA)	Toimivuse püsivuse hindamise ja kontrolli süsteem (AVCP)	Euroopa hindamisdokument	Tehnilise hindamise asutus (TAB)	Teavitatud asutus(ed) (NB)
ETA-18/1064 (2019-01-28)	1	EAD 330232-00-0601, (2016-10)	Instituto de Ciencias de la Construcción Eduardo Torroja (IETcc)	1219 (FPC)

Euroopa tehniline hinnang (ETA)	Põhiomadused	Toimivus
ETA-18/1064 (2019-01-28)	Characteristic resistance under static and quasi-static loading	ETA-18/1064 Annex C
	Reaction to fire	Class A1
	Resistance to fire	ETA-18/1064 Annex D

Eespool kirjeldatud toote toimivus vastab deklareeritud toimivusele. Käesolev toimivusdeklaratsioon on välja antud kooskõlas määrusega (EL) nr 305/2011 eespool nimetatud tootja ainuvastutusel.

Tootja poolt ja nimel allkirjastanud:

Kista 2020-08-18

Viktor Bukowski
Product Manager – Concrete Fasteners

[ETA attached as an appendix]

CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

INSTITUTO EDUARDO TORROJA

Designated according to Article 29 of Regulation (EU) Nº 305/2011

Member of EOTA
www.eota.eu

INSTITUTO DE CIENCIAS DE LA CONSTRUCCIÓN EDUARDO TORROJA
C/ Serrano Galvache n. 4 28033 Madrid (Spain)
Tel.: (34) 91 302 04 40 Fax: (34) 91 302 07 00
direccion.ietcc@csic.es https://dit.ietcc.csic.es

European Technical Assessment

ETA 18/1064 of 28/01/2019

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	**Essve EUS**
Product family to which the construction product belongs	Concrete screw of sizes 7.5, 10.5, 12.5 and 16.5 for use in cracked and non-cracked concrete.
Manufacturer	**ESSVE Produkter AB** Esbogatan 14 164 74 Kista Sweden
Manufacturing plants	**Plant no. 421**
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
This version replaces	-

English translation prepared by IETcc

This European Technical Assessment is issued by the Technical Assessment Body 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.

English translation prepared by IETcc

SPECIFIC PART

1. Technical description of the product

The Essve EUS concrete screw is an anchor made of carbon steel. The anchor is made in sizes 7.5, 10.5. 12.5 and 16.5, and is screwed into a predrilled cylindrical drill hole. The special thread of the anchor cuts an internal thread into the member while setting. The anchorage is characterised by mechanical interlock in the special thread.

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
Essve EUS performance for static or quasi static actions	See annex C

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorages satisfy requirements for class A1
Resistance to fire	See annex D

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 of Regulation (EU) No 305/2011) is 96/582/EC.

The system to be applied is 1.

English translation prepared by IETcc

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
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

C/ Serrano Galvache n.º 4. 28033 Madrid.
Tel: (+34) 91 302 04 40 Fax. (+34) 91 302 07 00
https://dit.ietcc.csic.es

On behalf of the Instituto de Ciencias de la Construcción Eduardo Torroja
Madrid, 28th of January 2019

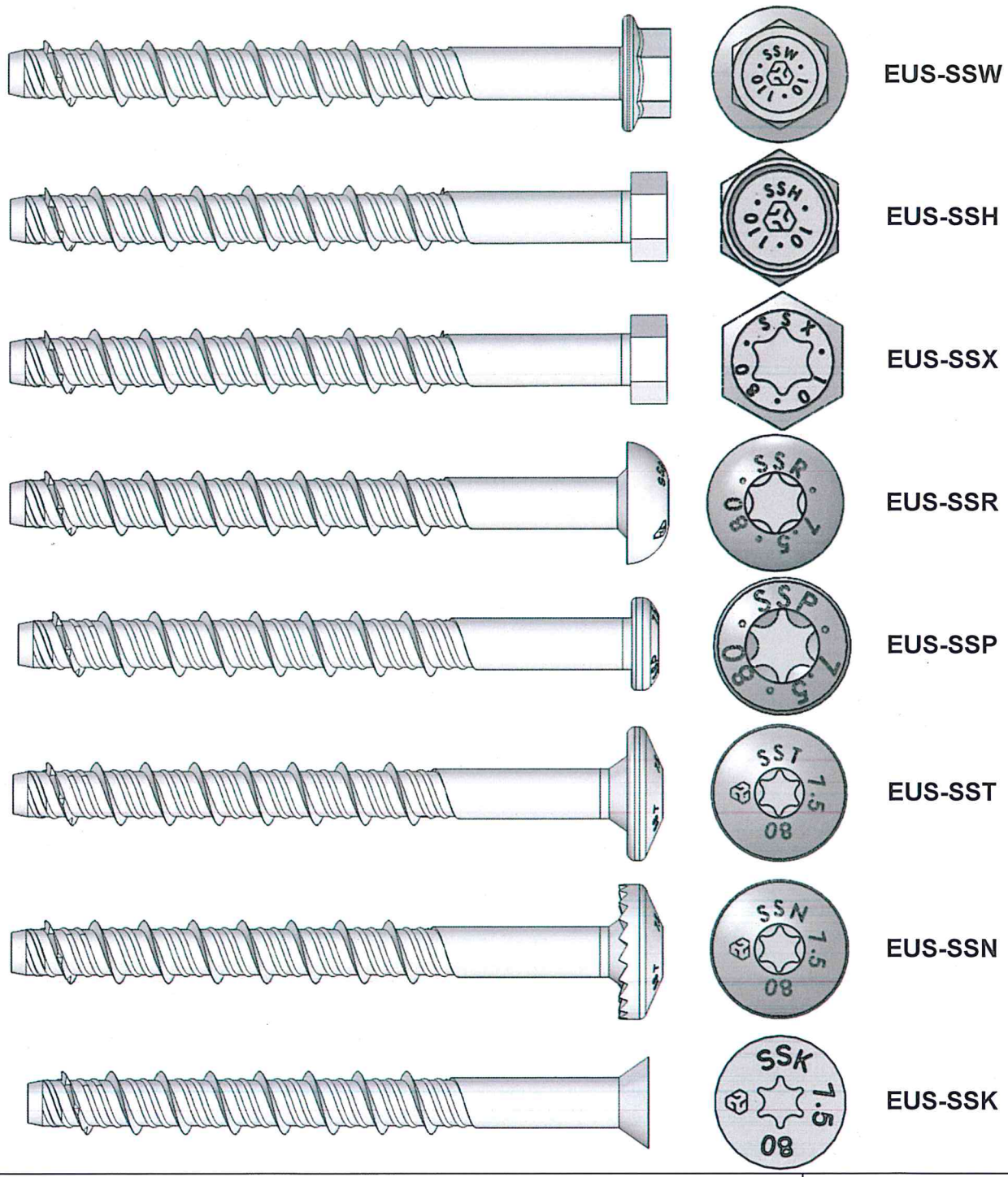
CASTILLO TALAVERA ANGEL - DNI 52507605P

Director IETcc-CSIC

English translation prepared by IETcc

Product and identification

Anchor Essve EUS



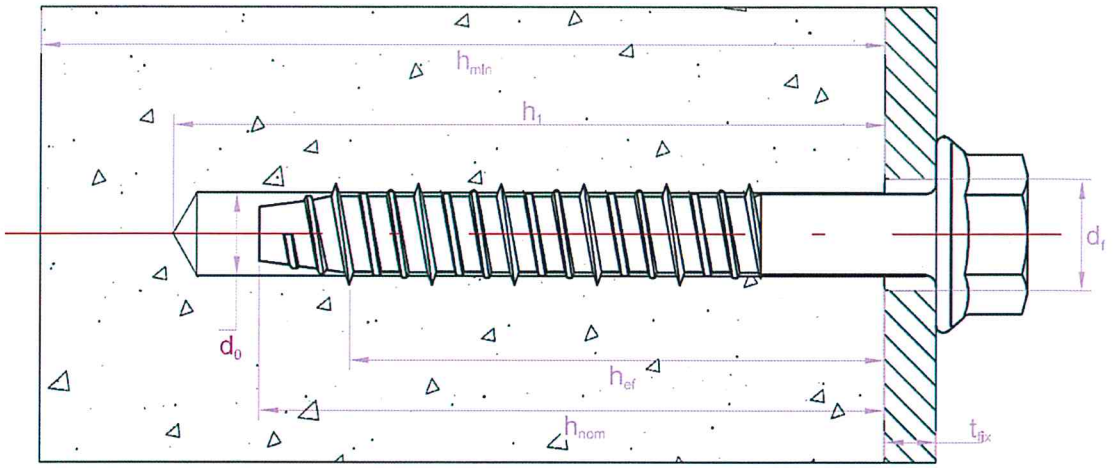
Essve EUS	
Product description Identification	**Annex A1**

Identification on anchor:

- Company logo
- Anchor type:
  - Hex head with washer: EUS-SSW
  - Hex head: EUS-SSH
  - Hex head, hexalobular recess: EUS-SSX
  - Round head: EUS-SSR
  - Pan head: EUS-SSP
  - Truss head: EUS-SST
  - Truss head with underhead ribs: EUS-SSN
  - Countersunk head: EUS-SSK
- Outer diameter
- Length

Essve EUS	**Annex A2**
Product description Identification	

Installed condition



h_{ef}: Effective anchorage depth
h_1: Depth of drilled hole
h_{nom}: Overall anchor embedment depth in the concrete
h_{min}: Minimum thickness of concrete member
t_{fix}: Thickness of fixture
d_0: Nominal diameter of drill bit
d_f: Diameter of clearance hole in fixture

Table A1: Materials

Item	Designation	Essve EUS
1	Anchor Body	Carbon steel wire rod cold forged. Allowed coatings: • Zinc plated ISO 4042 • Silver ruspert • Zinc flake EN 10683

Intended use

Anchorages 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.
- Cracked and uncracked concrete.

Use conditions (environmental conditions):

- The anchor shall be used in dry internal conditions.
- The anchor may be used for anchorages with requirements related to resistance to fire.

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 loads are designed for design Method A in accordance with:

  - EN 1992-4:2018

Installation:

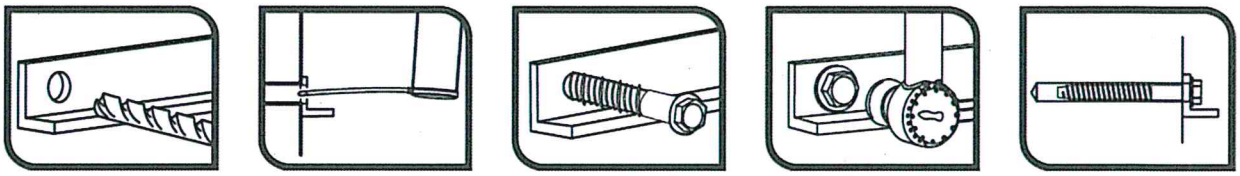
- Hammer drilling only.
- Anchor installation carried out by appropriately qualified personal and under the supervision of the person responsible for technical matters of the site.
- In case of aborted hole: new drilling at a minimum distance away of twice the depth of aborted hole or smaller distance 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.
- After installation further turning of the anchor is not possible. The head of the anchor is supported on the fixture and it is not damaged.

Essve EUS	**Annex B1**
Intended use Specifications	

Table B1: Installation parameters

Installation parameters			Performance			
			EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
d_0	Nominal diameter of drill bit:	[mm]	6	8	10	14
d_f	Diameter of clearance hole in fixture:	[mm]	9	12	14	18
d_s	Outer diameter of the thread	[mm]	7.5	10.5	12.5	16.5
L_{min}	Total length of the anchor	[mm]	60	65	75	115
L_{max}		[mm]	400	400	400	400
h_{min}	Minimum thickness of concrete member:	[mm]	100	100	105	175
h_1	Depth of drilled hole:	[mm]	65	70	85	130
h_{nom}	Overall anchor embedment depth in the concrete:	[mm]	55	60	70	110
h_{ef}	Effective anchorage depth:	[mm]	42	45	52	86
T_{ins}	Installation torque	[Nm]	20	50	80	120
t_{fix}	Thickness of fixture	[mm]	L-55	L-60	L-70	L-110
s_{min}	Minimum allowable spacing:	[mm]	45	50	60	100
c_{min}	Minimum allowable edge distance:	[mm]	45	50	60	100

Installation process



Anchor shall be installed using a torque wrench or an electrical impact driver; power input: 500 W; torque: 50-250 Nm. (e.g: Bosch GDS 18E)

Table C1: Characteristic values to tension loads of design method A

Characteristic values of resistance to tension loads of design method A			Performance			
			EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
Tension loads: steel failure						
$N_{Rk,s}$	Tension steel characteristic resistance:	[kN]	18.7	32.7	51.2	115.9
γ_{Ms}	Partial safety factor:*)	[-]	1.5	1.5	1.5	1.5
Tension loads: pull-out failure in concrete						
$N_{Rk,p,\ ucr}$	Tension characteristic resistance in C20/25 uncracked concrete:	[kN]	9	12	20	40
$\psi_{c,ucr}$	C30/37	[-]	1,22	1,08	1,04	1,04
$\psi_{c,ucr}$	C40/45	[-]	1,41	1,15	1,07	1,07
$\psi_{c,ucr}$	C50/60	[-]	1,55	1,19	1,09	1,09
$N_{Rk,p,cr}$	Tension characteristic resistance in C20/25 cracked concrete:	[kN]	6	9	12	30
$\psi_{c,cr}$	C30/37	[-]	1,22	1,22	1,22	1,12
$\psi_{c,cr}$	C40/45	[-]	1,41	1,41	1,41	1,23
$\psi_{c,cr}$	C50/60	[-]	1,55	1,55	1,55	1,30
γ_{Mp}	Partial safety factor: *)	[-]	1.8	1.8	1.8	1.5
Tension loads: concrete cone and splitting failure						
h_{ef}	Effective embedment depth:	[mm]	42	45	52	86
γ_{Mc}	Partial safety factor: *)	[-]	1.8	1.8	1.8	1.5
$s_{cr,N}$	Critical spacing:	[mm]	126	135	156	258
$c_{cr,N}$	Critical edge distance:	[mm]	63	67	78	129
$s_{cr,sp}$	Critica spacing (splitting):	[mm]	126	135	177	292
$c_{cr,sp}$	Critical edge distance (splitting):	[mm]	63	67	88	146
γ_{Msp}	Partial safety factor: *)	[-]	1.8	1.8	1.8	1.5

*) In absence of other national regulations

Table C2: Displacements under tension loads for Essve EUS

Displacements under tension loads in uncracked concrete			Performance			
			EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
N	Service tension load in uncracked concrete C20/25 to C50/60:	[kN]	3.6	4.8	9.5	19.0
δ_{N0}	Short term displacement under tension loads:	[mm]	0.4	0.4	0.4	0.9
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1.0	1.1	1.4	1.4
Displacements under tension loads in cracked concrete			**Performance**			
			EUS 7.5	**EUS 10.5**	**EUS 12.5**	**EUS 16.5**
N	Service tension load in cracked concrete C20/25 to C50/60:	[kN]	2.4	3.6	5.7	11.9
δ_{N0}	Short term displacement under tension loads:	[mm]	0.6	0.7	0.5	0.6
$\delta_{N\infty}$	Long term displacement under tension loads:	[mm]	1.4	1.2	1.4	1.2

Table C3: Characteristic values to shear loads of design method A

Characteristic values of resistance to shear loads of design method A			Performance			
			EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
Shear loads: steel failure without lever arm						
$V_{Rk,s}$	Shear steel characteristic resistance:	[kN]	7.5	16.3	35.6	57.9
γ_{Ms}	Partial safety factor: *)	[-]	1.25	1.25	1.25	1.25
Shear loads: steel failure with lever arm						
$M^0_{Rk,s}$	Characteristic bending moment:	[Nm]	15.2	35.3	69.3	235.
γ_{Ms}	Partial safety factor: *)	[-]	1.25	1.25	1.25	1.25
Shear loads: concrete pryout failure						
K	K factor:	[-]	1	1	1	2
γ_{Mpr}	Partial safety factor: *)	[-]	1.5	1.5	1.5	1.5
Shear loads: concrete edge failure						
l_f	Effective anchorage depth under shear loads:	[mm]	42	45	52	86
d_{nom}	Outside anchor diameter:	[mm]	7.5	10.5	12.5	16.5
γ_{Mc}	Partial safety factor: *)	[-]	1.5	1.5	1.5	1.5

*) In absence of other national regulations

Table C4: Displacements under shear loads for Essve EUS

Displacements under shear loads			Performances			
			EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
V	Service shear load in cracked and uncracked concrete C20/25 to C50/60:	[kN]	3.0	6.5	12.2	27.6
δ_{V0}	Short term displacement under shear loads:	[mm]	1.3	1.4	1.8	2.3
$\delta_{V\infty}$	Long term displacement under shear loads:	[mm]	2.0	2.1	2.7	3.5

English translation prepared by IETcc

Table D1: Characteristic values to fire resistance

Fire resistance duration = 30 minutes		EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
Tension loads, steel failure					
$N_{Rk,s,fi,30}$ Characteristic resistance	[kN]	0.23	0.61	1.28	2.90
Pull-out failure					
$N_{Rk,p,fi,30}$ Character. resistance in concrete C20/25 to C50/60	[kN]	1.50	2.25	3.00	7.50
Concrete cone failure **)					
$N_{Rk,c,fi,30}$ Character. resistance in concrete C20/25 to C50/60	[kN]	2.06	2.45	3.51	12.35
Shear loads steel failure without lever arm					
$V_{Rk,s,fi,30}$ Characteristic resistance	[kN]	0.23	0.61	1.28	2.90
Shear loads, steel failure with lever arm					
$M_{Rk,s,fi,60}$ Characteristic bending resistance	[Nm]	0.19	0.66	1.73	5.90

Fire resistance duration = 60 minutes		EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
Tension loads, steel failure					
$N_{Rk,s,fi,60}$ Characteristic resistance	[kN]	0.21	0.53	0.96	2.17
Pull-out failure					
$N_{Rk,p,fi,60}$ Character. resistance in concrete C20/25 to C50/60	[kN]	1.50	2.25	3.00	7.50
Concrete cone failure **)					
$N_{Rk,c,fi,60}$ Character. resistance in concrete C20/25 to C50/60	[kN]	2.06	2.45	3.51	12.35
Shear loads, steel failure without lever arm					
$V_{Rk,s,fi,60}$ Characteristic resistance	[kN]	0.21	0.53	0.96	2.17
Shear loads, steel failure with lever arm					
$M_{Rk,s,fi,60}$ Characteristic bending resistance	[Nm]	0.17	0.57	1.30	4.42

Fire resistance duration = 90 minutes		EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
Tension loads, steel failure					
$N_{Rk,s,fi,90}$ Characteristic resistance	[kN]	0.16	0.41	0.83	1.88
Pull-out failure					
$N_{Rk,p,fi,90}$ Character. resistance in concrete C20/25 to C50/60	[kN]	1.50	2.25	3.00	7.50
Concrete cone failure **)					
$N_{Rk,c,fi,90}$ Character. resistance in concrete C20/25 to C50/60	[kN]	2.06	2.45	3.51	12.35
Shear loads, steel failure without lever arm					
$V_{Rk,s,fi,90}$ Characteristic resistance	[kN]	0.16	0.41	0.83	1.88
Shear loads, steel failure with lever arm					
$M_{Rk,s,fi,90}$ Characteristic bending resistance	[Nm]	0.13	0.44	1.13	3.83

English translation prepared by IETcc

Fire resistance duration = 120 minutes			EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
Tension loads, steel failure						
$N_{Rk,s,fi,120}$	Characteristic resistance	[kN]	0.12	0.33	0.64	1.45
Pull-out failure						
$N_{Rk,p,fi,120}$	Character. resistance in concrete C20/25 to C50/60	[kN]	1,20	1.80	2.40	6.00
Concrete cone failure **)						
$N_{Rk,c,fi,120}$	Character. resistance in concrete C20/25 to C50/60	[kN]	1.65	1.96	2.81	9.88
Shear loads, steel failure without lever arm						
$V_{Rk,s,fi,120}$	Characteristic resistance	[kN]	0.12	0.33	0.64	1.45
Shear loads, steel failure with lever arm						
$M_{Rk,s,fi,120}$	Characteristic bending resistance	[Nm]	0.10	0.35	0.87	2.95

Spacing and edge distances			EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
$S_{cr,N}$	Spacing	[mm]	168	180	208	344
S_{min}	Minimum spacing	[mm]	45	50	60	100
$C_{cr,N}$	Edge distance	[mm]	84	90	104	172
C_{min}	Minimum edge distance (one side fire)	[mm]	84	90	104	172
C_{min}	Minimum edge distance (two sides fire)	[mm]	300	300	300	300
γ_{Msp}	Partial safety factor*)	[-]	1.0	1.0	1.0	1.0

*) In absence of other national regulations
**) As a rule, splitting failure can be neglected when cracked concrete and reinforcement is assumed.

Concrete pry-out failure		EUS 7.5	EUS 10.5	EUS 12.5	EUS 16.5
K factor	[--]	1	1	1	2
EN 1992-4:2018, these values of k factor and the relevant values of $N_{Rk,c,fi}$ given in the above tables have to be considered in the design.					

Concrete edge failure

The characteristic resistance $V^0_{RK,c,fi}$ in C20/25 to C50/60 concrete is determined by:
$V^0_{RK,c,fi} = 0,25 \times V^0_{RK,c}$ (≤ R90) and $V^0_{RK,c,fi} = 0,20 \times V^0_{RK,c}$ (R120)
With $V^0_{RK,c}$ initial value of the characteristic resistance in cracked concrete C20/25 under normal temperature, according to EN 1992-4:2018.

Essve EUS

Performances
Characteristic values for fire resistance

Annex D2