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Authorized and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

MEMBER OF EOTA

European Technical Assessment ETA-22/0613 of 2026/04/10

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S	
Trade name of the construction product:	CELO cable and pipe fixings
Product family to which the above construction product belongs:	Power-actuated fastener for multiple use in concrete for non-structural applications
Manufacturer:	CELO FIJACIONES S.L. C/Rosselló, 7 08211 Castellar del Vallès (Barcelona) SPAIN Internet: www.celofixings.com
Manufacturing plant:	Plant 19 Plant 20
This European Technical Assessment contains:	27 pages including 23 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Article 95(4) of Regulation (EU) 2024/3110, on the basis of:	EAD 330083-04-0601 for Power-actuated fastener in concrete for redundant non-structural applications
This version replaces:	The ETA with the same number issued on 2025-02-14

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II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

The CELO cable and pipe fixings consists of the power-actuated fastener (CELO nails XHA) made of zinc plated steel and the fixture according to Annex A1 made of zinc plated steel, polyamide or HDPE. The power-actuated fasteners are driven in the concrete by using a gas-actuated fastening tool (CELO FORCE ONE and CELO FORCE ONE+).

They are anchored in concrete by sintering and mechanical interlock.

The fasteners are assessed as fastener type 3 in accordance with clause 1.1 of the EAD.

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD)

The performances given in Section 3 are only valid if the fastener is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this EAD is based lead to the assumption of a working life of the fastener of at least 50 years.

Technical Assessments are based on an assumed intended working life of the anchor of 50 years.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body, 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
Maximum service loads in non-cracked and cracked concrete	See Annex C1 to C8
Number of fixing points – n_1	$10 \leq n_1 \leq 100$
Uniform span between the fixing points	≤ 1m
Acceptable gaps (number of failure next to each other) for local failure	See Annex C1 to C8
Acceptable gaps (number of failure next to each other) for serviceability limit state	See Annex C1 to C8
Durability	Durability is ensured if the specifications of intended use according to Annex B are taken into account

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	The fasteners and fixtures are made from steel classified as Euroclass A1 in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364
Reaction to fire of fixtures made of polyamide or HDPE	No performance assessed
Resistance to fire	No performance assessed

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

In accordance with EAD 33083-02-0601, the applicable European legal act is: 1997/463/EC.
The system to be applied is: 2+

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking.

Issued in Copenhagen on 2026-04-10 by



Thomas Bruun
Managing Director, ETA-Danmark

CELO cable and pipe fixings: description

Table A1: Fixtures made of plastics

ABT	UT	TBB
		
WSC	**WDC**	
		
FP	**FPD**	**TBBL**
		
4NCC	**8NCC**	**16NCC**
		
15CHN	**30CHN**	
		

Table A2: Fixtures made of steel

PFT	DFT	AAT
		

ATR	CHS
	

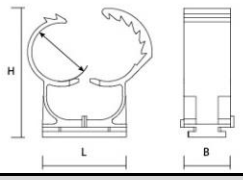
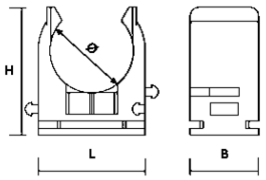
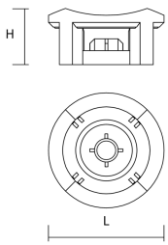
ATV	AWFS
	

CELO nail XHA22, XHA27, XHA32 and XHA38

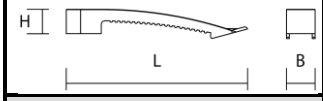
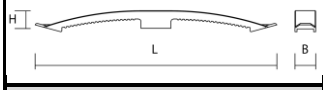
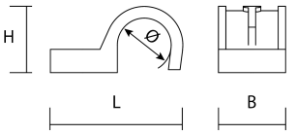
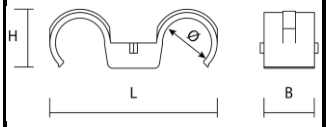
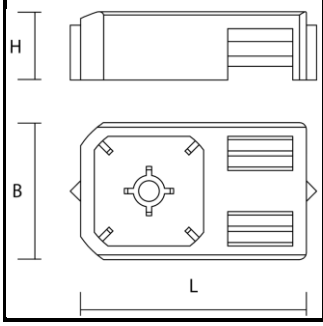


CELO cable and pipe fixings: dimensions and materials

Table A3: Fixtures made of plastic

Cable and pipe fixings						
	Designation	**Dimensions and material**				
ABT		**L**	**H**	**B**	**Ø**	**Material**
	ABT 14-18	24	35,6	20	14,5	PA6
	ABT 20-25	29	45,5	20	45,5	
	ABT 26-32	36	53,6	20	53,6	
	ABT 35-42	45	66,4	20	66,4	
UT		**L**	**H**	**B**	**Ø**	**Material**
	UT16	23	25,5	16	15,5	HDPE
	UT20	25	29,5	16	19,5	
	UT25	30,5	34	16	24,5	
	UT32	38	42	16	31	
	UT40	46	50	16	39	
TBB		**L**		**H**		**Material**
	TBB	27,5		13		PA6

CELO cable and pipe fixings	**Annex A2**
Product description Dimensions and materials	

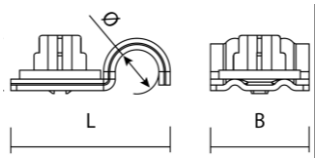
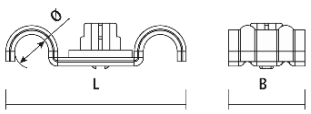
Cable and pipe fixings						
	Designation	Dimensions and material				
WSC		**L**	**H**	**B**		**Material**
	WSC	127	17	20		PA6
WDC		**L**	**H**	**B**		**Material**
	WDC	234	17	20		PA6
FP		**L**	**H**	**B**	**Ø**	**Material**
	FP-16	41,5	18,5	23	14,5	HDPE
	FP-18	43,5	20,5		16,5	
	FP-20	45,5	22,5		18,5	
	FP-22	47,5	24,5		20,5	
	FP-25	50,5	27,5		23,5	
	FP-28	53,5	30,5		26,5	
	FP-32	57,5	24,5		30,5	
FPD		**L**	**H**	**B**	**Ø**	**Material**
	FPD-16-19	59	19,5	20	15,5	HDPE
	FPD-20-23	68	23,75		19,5	
	FPD-25-28	81	29		24,5	
	FPD-32-35	96,5	36,25		31,5	
TBBL		**L**	**H**	**B**		**Material**
	TBBL	33	10	20		PA6

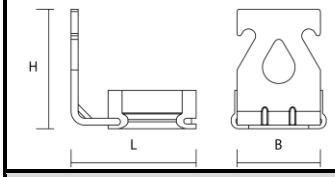
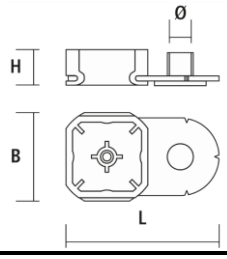
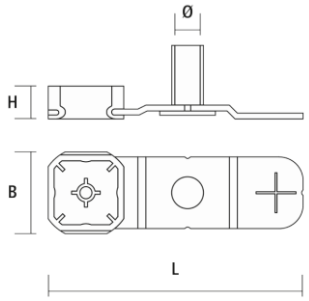
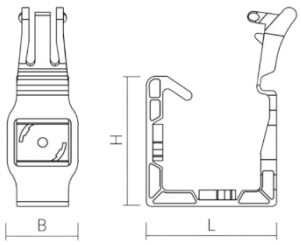
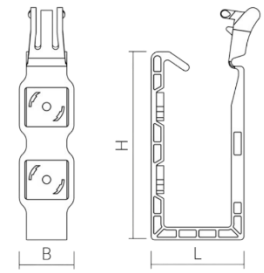
CELO cable and pipe fixings

Annex A3

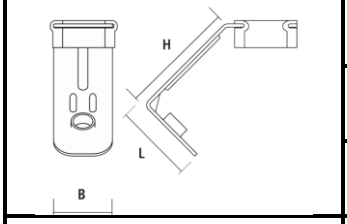
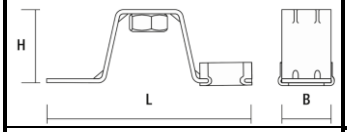
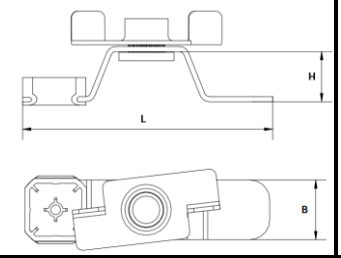
Product description
Dimensions and materials

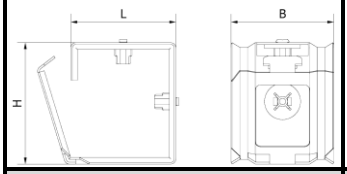
Table A4: Fixtures made of steel

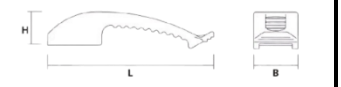
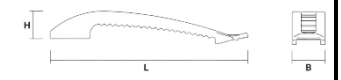
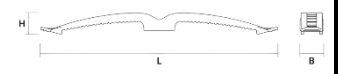
Cable and pipe fixings					
	Designation	Dimensions and material			
PFT		**L**	**B**	**Ø**	**Material**
	PFT-5	24	17	4,5	Steel
	PFT-6	26		6	
	PFT-7	26,5		6,5	
	PFT-8	27,5		7,5	
	PFT-10	29,5		9,5	
	PFT-12	31,5		11,5	
	PFT-14	33,5		13,5	
	PFT-16	34,5		15,5	
	PFT-18	36,5		17,5	
	PFT-20	38,5		19,5	
	PFT-22	40,5		21,5	
	PFT-25	43,5		24,5	
	PFT-28	46,5		27,5	
	PFT-32	52		31,5	
	PFT-40	60		39,5	
	PFT-50	70		49,5	
DFT		**L**	**B**	**Ø**	**Material**
	DFT-5	33	17	4,5	Steel
	DFT-6	37		6	
	DFT-7	38		6,5	
	DFT-8	40		7,5	
	DFT-10	44		9,5	
	DFT-12	48		11,5	
	DFT-16	56		15,5	
	DFT-18	60		17,5	
	DFT-20	64		19,5	
	DFT-22	68		21,5	
	DFT-25	74		24,5	
	DFT-28	80		27,5	
	DFT-32	88		31,5	

Cable and pipe fixings						
	Designation	Dimensions and material				
AAT		**L**	**H**	**B**		**Material**
	AAT	26	26	18		Steel
ATR		**L**	**H**	**B**	**Ø**	**Material**
	ATR-M6	35	8,5	18	M6X6	Steel
	ATR-M8C	64	8,5	18	M8X9	Steel
	ATR-M8L				M8X18	
CHN		**L**	**H**	**B**		**Material**
	15CHN	55	55	30		PA6
	30CHN	51	103	30		PA6

CELO cable and pipe fixings	**Annex A5**
Product description Dimensions and materials	

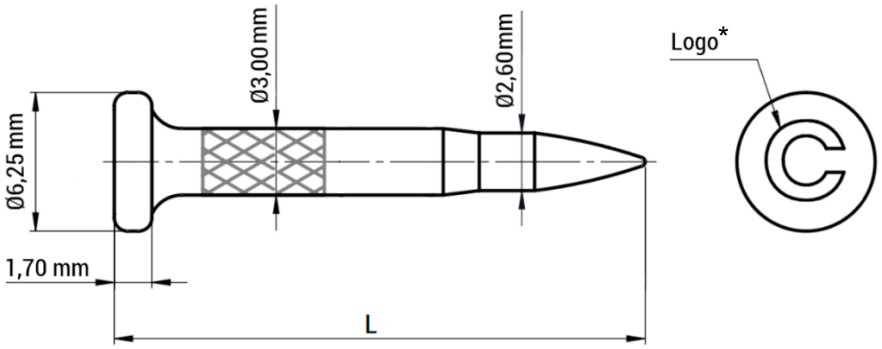
ATV		L	H	B	Ø	Material
	ATV-M4	20	32	18	M4	Steel
	ATV-M5				M5	
	ATV-M6				M6	
	ATVS-M8	75	25	18	M8	Steel
	ATV-M8	75	15	18	M8	

CHS		L	H	B	Material
	CHS	47	41	40	Steel
		35	87	40	

NCC		L	H	B	Material
	4NCC	75	15	20	PA6
	8NCC	121	16.8	20	
	16NCC	222	16.8	22	

AWFS		L	Ø	Material
	AWFS	3 m	1.5	Gripper: Al Wire: Steel AAT: Steel
		5 m		

CELO XHA nail: dimensions and material



*Brand marking is optional

Table A5: Power-actuated fastener

XHA nail		XHA22	XHA27	XHA32	XHA38
L	(mm)	22	27	32	38
Material		Hardened carbon steel, hardness 53-57 HRC			

Specification of intended use

Anchorages subject to

- Dead-loads of uniaxially spanned flexible or rigid cables and pipes.
- Static or quasi-static loading in reinforced or unreinforced concrete.
- Multiple fixing of non-structural application.

Base materials

- Strength classes C20/25 to C50/60 according to EN 206-1.
- Cracked and non-cracked concrete.
- Steel plate.

Use conditions

- Structures subject to dry internal conditions.
- Temperature range:
  Fixtures made of steel: between -40ºC to +80ºC,
  Fixtures made of plastic: maximum long-term temperature +24ºC, maximum short-term temperature +40ºC;
  for plastic fixtures made of polyamide minimum long-term temperature -20ºC and for plastic fixtures made of polyethylene minimum long-term temperature 0ºC.
- The fixtures made of PE cannot be exposed to UV-radiation for more than 6 weeks.

Design

- Conditions: Both ends of the chain are fixed supports (e.g. fixation in a cable-terminal box or where cables are led through interior rigid walls).
- Design: $F = g \cdot l \leq F_{s,max}$
  With:
  F = dead load of the cable or conduit acting on the fixture made of plastic or steel in N.
  g = dead load of the cable or conduit in N/m.
  l = spacing of the fasteners in m.
  $F_{s,max}$ = maximum service load (maximum possible loads) $N_{s,max}$ or $V_{s,max}$ in N according to Annex C1 to C6.

Notes:

- A potential influence of an eccentric load introduction into the power-actuated nail is taken into consideration in corresponding published loads shown in Annex C1 to C6.

- For fixtures made of plastic, the long-term effect due to creep is taken into consideration according to EN ISO 899-1.

- The loads given in Annexes C1 to C6 include the required safety against total failure of the global system according to EN 1990:2002 + A1:2005 + A1:2005/AC:2010 (Reliability class RC2, ultimate limit state, $\beta \geq 1.5$).

  The corresponding maximum service loads are valid for potential gaps due to single or maximum 3 fastener failures next to each other (see Annex C1 to C6). The fastener may be used if the cable sagging due to the given gaps have not bad appearance and the designer/user accepts these gaps.

- The loads given in Annexes C1 to C6 include the required safety against local failure according to EN 1990:2002 + A1:2005/AC:2010 (Reliability class RC1, ultimate limit state, $\beta \geq 3.3$).

  The corresponding maximum service loads are valid for potential gaps due to single or maximum 4 fastener failure next to each other (see Annex C1 to C6). The fastener may be used if the cable sagging due to the given gaps do not lead to a risk of use and the designer/user accepts these gaps.

Installation

- Fastener installation carried out by appropriately qualified personnel.
- Fastener installation in accordance with the manufacturer's specifications and drawings and using the specified installation device.
- Fasteners to be installed ensuring not less than the minimum effective anchorage depth of 11mm. If the embedment depth is smaller than the minimum effective anchorage depth the nail must be assumed as a setting defect.
- Use of setting tools according to Annex B5.

Table B1: Concrete and installation parameters

Power-actuated fastener		XHA22	XHA27	XHA32	XHA38
Minimum concrete strength class	[-]	C20/25			
Maximum concrete strength class	[-]	C50/60			
Minimum spacing s_{min}	[mm]	200			
Minimum edge distance c_{min}	[mm]	150			
Minimum thickness of concrete member h_{min}	[mm]	80			
Effective embedment depth	[mm]	≥ 11			

Power-actuated fastening tool

Table B3: Power-actuated fastening tool

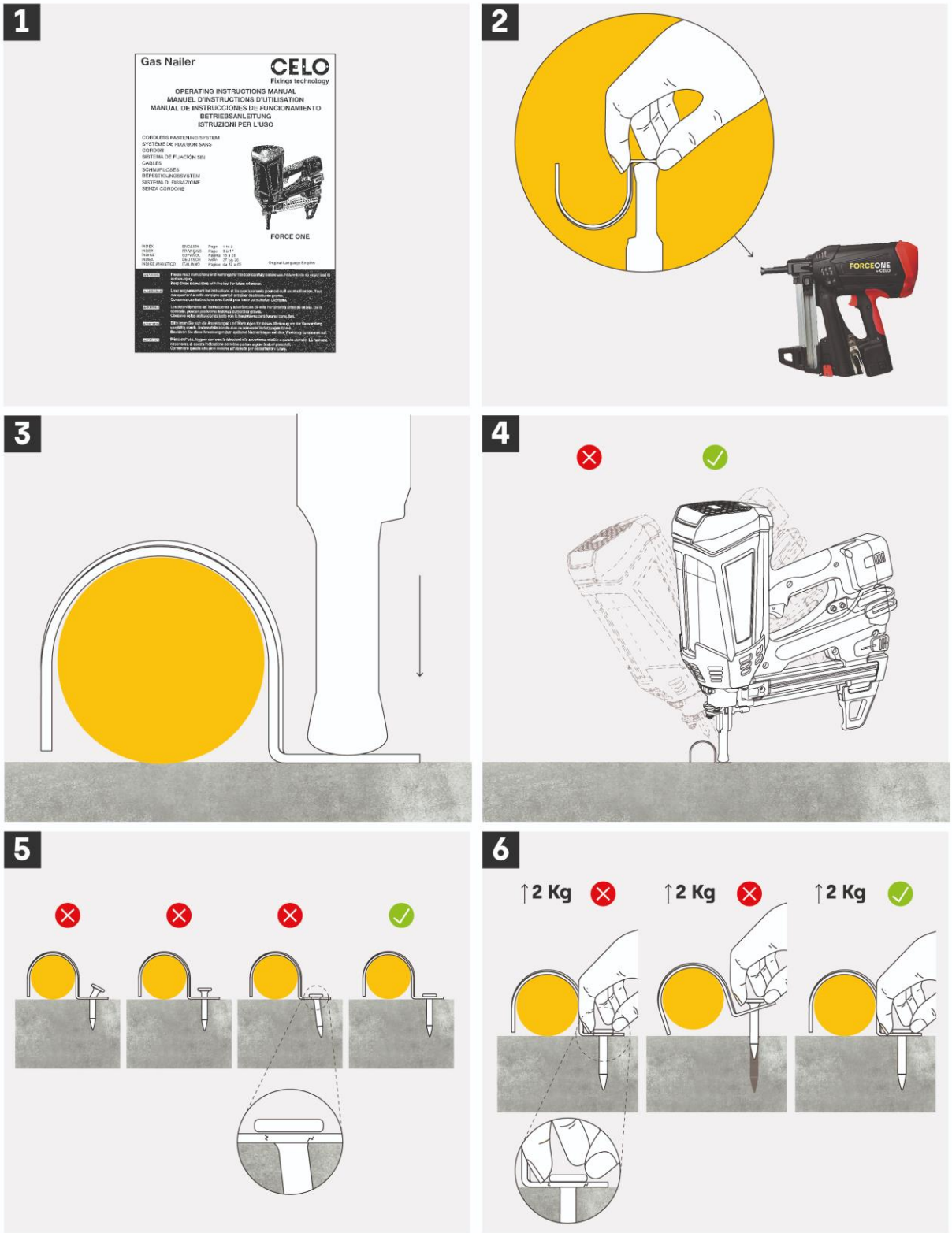
Fastening tool
FORCE ONE by CELO with nails XHA
 Fastening tool FONE: gas driven

Power-actuated fastening tool

Table B3: Power-actuated fastening tool

Fastening tool
FORCE ONE+ by CELO with nails XHA
 Fastening tool FONE+: gas driven

Installation instruction



CELO cable and pipe fixings	**Annex B6**
Intended use Installation instruction	

Installation instruction

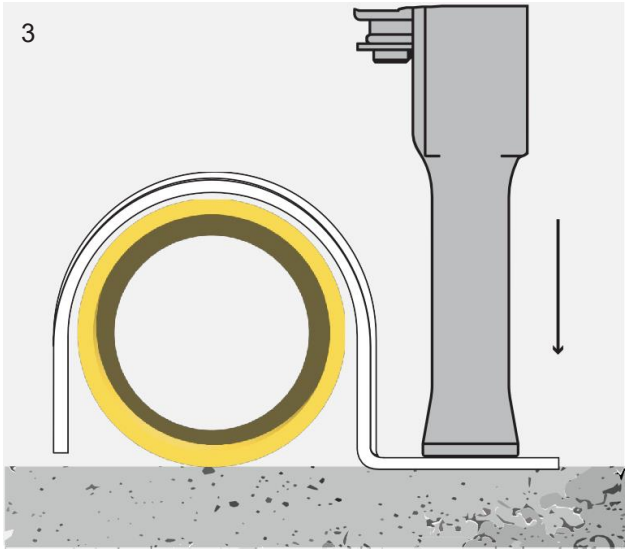
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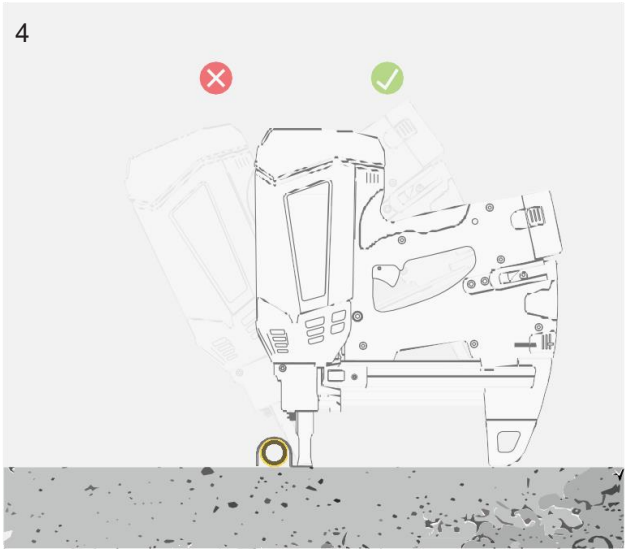
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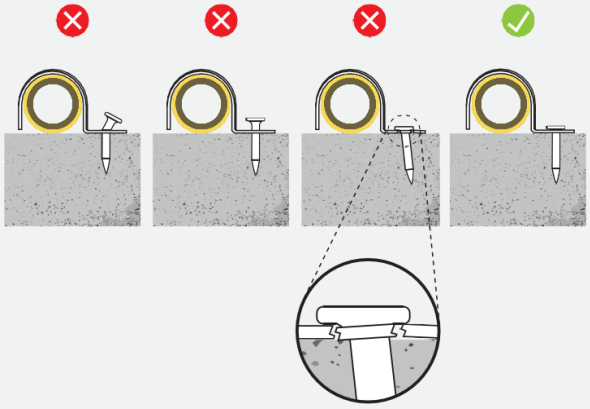
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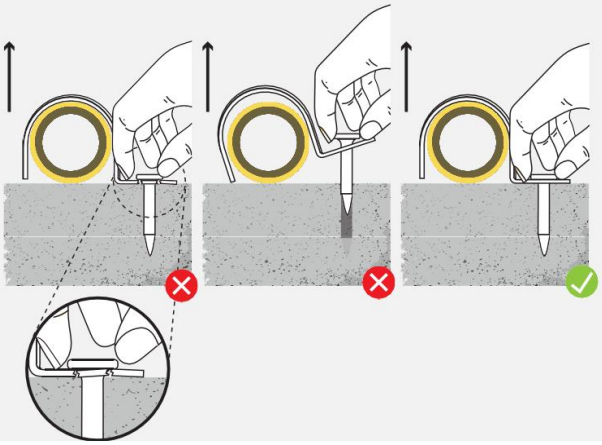
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5



6



CELO cable and pipe fixings

Annex B7

Intended use
Installation instruction

Table C1: Maximum service loads $N_{s,max}$ and $V_{s,max}$

The acceptable gap corresponds to the number of failures next to each other.

ABT with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	1,7	4,3	5,6
	2	15,0	19,5	45,0	58,5
	3	30,8	40,0	78,0	101,4
Acceptable gap for local failure β ≥ 3.3	2	2,0	2,6	8,5	11,0
	3	8,0	10,4	25,6	33,3
	4	14,7	19,1	48,3	62,8

UT with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,0	1,3	2,0	2,6
	2	7,5	9,7	18,5	24,0
	3	13,2	17,1	37,6	48,9
Acceptable gap for local failure β ≥ 3.3	2	1,3	1,7	4,0	5,2
	3	5,2	6,7	13,2	17,1
	4	8,3	10,8	20,0	26,0

TBB with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	1,7	2,0	2,6
	2	15,0	19,5	18,5	24,0
	3	30,8	40,0	60,0	78,0
Acceptable gap for local failure β ≥ 3.3	2	2,0	2,6	3,3	4,3
	3	6,0	7,8	13,2	17,1
	4	11,0	14,3	17,7	23,0

WSC with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,0	1,3	-	-
	2	11,0	14,3		
	3	14,8	19,2		
Acceptable gap for local failure β ≥ 3.3	2	1,5	1,9		
	3	6,0	7,8		
	4	8,3	10,8		

WDC with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	1,7	-	-
	2	12,5	16,2		
	3	11,6	15,1		
Acceptable gap for local failure β ≥ 3.3	2	2,0	2,6		
	3	6,0	7,8		
	4	8,3	10,8		

FP with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	1,7	4,3	5,6
	2	13,5	17,5	23,5	30,5
	3	24,0	31,2	6,8	8,8
Acceptable gap for local failure β ≥ 3.3	2	1,5	1,9	23,5	30,5
	3	6,4	8,3	6,8	8,8
	4	12,3	16,0	15,7	20,4

FPD with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,0	1,3	4,3	5,6
	2	12,9	16,8	21,0	27,3
	3	26,0	33,8	16,8	21,8
Acceptable gap for local failure β ≥ 3.3	2	1,3	1,7	8,5	11,0
	3	5,2	6,7	18,0	23,4
	4	11,0	14,3	17,7	23,0

TBBL with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	0,6	0,8	1,7	2,2
	2	8,0	10,4	11,5	14,9
	3	18,0	23,4	12,4	16,1
Acceptable gap for local failure β ≥ 3.3	2	1,0	1,3	2,5	3,2
	3	3,2	4,1	8,0	10,4
	4	7,3	9,5	10,0	13,0

PFT with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	1,7	3,7	4,8
	2	13,5	17,5	32,5	42,2
	3	29,6	38,5	60,0	78,0
Acceptable gap for local failure β ≥ 3.3	2	1,5	1,9	6,5	8,4
	3	6,8	8,8	21,2	27,5
	4	11,0	14,3	33,3	43,3

DFT with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	0,3	0,4	4,3	5,6
	2	6,5	8,4	45,0	58,5
	3	14,8	19,2	84,0	109,2
Acceptable gap for local failure β ≥ 3.3	2	1,0	1,3	8,5	11,0
	3	3,2	4,1	26,0	33,8
	4	5,7	7,4	50,0	65,0

AAT with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,0	1,3	-	-
	2	10,5	13,6		
	3	21,2	27,5		
Acceptable gap for local failure β ≥ 3.3	2	1,3	1,7		
	3	4,8	6,2		
	4	10,0	13,0		

ATR with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	0,3	0,4	4,3	5,6
	2	6,5	8,4	45,0	58,5
	3	13,2	17,1	86,0	111,8
Acceptable gap for local failure β ≥ 3.3	2	1,0	1,3	8,5	11,0
	3	3,2	4,1	30,0	39,0
	4	7,0	9,1	50,0	65,0

ATV-M4, M5 and M6 with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,0	1,3	-	-
	2	13,5	17,5		
	3	28,8	37,4		
Acceptable gap for local failure β ≥ 3.3	2	1,5	1,9		
	3	6,8	8,8		
	4	12,3	16,0		

ATVS-M8 with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	1,7	-	-
	2	15,0	19,5		
	3	30,8	40,0		
Acceptable gap for local failure β ≥ 3.3	2	1,5	1,9		
	3	6,4	8,3		
	4	12,3	16,0		

ATV-M8 with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	1,7	-	-
	2	15,0	19,5		
	3	28,8	37,4		
Acceptable gap for local failure β ≥ 3.3	2	1,5	1,9		
	3	6,8	8,8		
	4	12,3	16,0		

CHS 41x47 with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	1,7	5,3	6,9
	2	15,0	19,5	40,0	52,0
	3	29,6	38,5	76,0	98,8
Acceptable gap for local failure β ≥ 3.3	2	1,8	2,3	6,5	8,4
	3	6,8	8,8	24,0	31,2
	4	11,0	14,3	43,0	55,9

CHS 87x35 with XHA					
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]		Maximum shear service load $V_{s,max}$ [N]	
		C20/25	C50/60	C20/25	C50/60
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,0	1,3	0,0	0,0
	2	14,0	18,2	4,0	5,2
	3	28,4	36,9	8,0	10,4
Acceptable gap for local failure β ≥ 3.3	2	1,8	2,3	0,8	1,0
	3	6,4	8,3	2,6	3,4
	4	12,3	16,0	4,5	5,8

15CHN with XHA			
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]	Maximum shear service load $V_{s,max}$ [N]
		Steel plate	Steel plate
Acceptable gap for serviceability limit state β ≥ 1.5	1	2	6,5
	2	30	90
	3	77	210
Acceptable gap for local failure β ≥ 3.3	2	4	17
	3	15	65
	4	33	150

30CHN with XHA			
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]	Maximum shear service load $V_{s,max}$ [N]
		Steel plate	Steel plate
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	2
	2	15	18,5
	3	28,8	61
Acceptable gap for local failure β ≥ 3.3	2	2	3,3
	3	6,2	13,2
	4	10,5	16,7

4NCC with XHA			
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]	Maximum shear service load $V_{s,max}$ [N]
		Steel plate	Steel plate
Acceptable gap for serviceability limit state β ≥ 1.5	1	0,85	-
	2	10,9	
	3	13,8	
Acceptable gap for local failure β ≥ 3.3	2	1,6	
	3	6	
	4	8,2	

8NCC with XHA			
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]	Maximum shear service load $V_{s,max}$ [N]
		Steel plate	Steel plate
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	-
	2	15	
	3	19	
Acceptable gap for local failure β ≥ 3.3	2	2	
	3	6	
	4	11	

16NCC with XHA			
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]	Maximum shear service load $V_{s,max}$ [N]
		Steel plate	Steel plate
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,3	-
	2	12,5	
	3	11,6	
Acceptable gap for local failure β ≥ 3.3	2	2	
	3	6	
	4	8,3	

AWFS with XHA			
Number of fixing points n_1 = 100		Maximum tension service load $N_{s,max}$ [N]	Maximum shear service load $V_{s,max}$ [N]
		Steel plate	Steel plate
Acceptable gap for serviceability limit state β ≥ 1.5	1	1,4	-
	2	19,5	
	3	1,9	
Acceptable gap for local failure β ≥ 3.3	2	2,3	
	3	10	
	4	25	