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Series: NATIONAL TECHNICAL ASSESSMENTS

CNBOP-PIB NATIONAL TECHNICAL ASSESSMENT CNBOP-PIB-KOT-2018/2022/0037-3703 1ST EDITION

This CNBOP-PIB national technical assessment is a prolongation of CNBOP-PIB national technical assessment no. CNBOP-PIB-KOT-2018/0037-3703 3rd edition

Based on the regulation of the Minister of Infrastructure and Construction of November 17, 2016 on national technical assessments (Journal of Laws of 2016, item 1968) as a result of procedure on the issue of National Technical Assessment performed in Scientific and research center for fire protection – National Research Institute in Józefów k. Otwocka at the request of

CELO POLSKA Sp. z o.o.
ul. Poprzeczna 50
95-050 Konstantynów Łódzki

the assessment of the performance for the intended use of the construction product designated as **CELO cable assemblies (cable supporting structures including wires and cables) of E30, E60, E90 class of maintaining electrical function according to DIN 4102-12:1998,**

manufactured by: **CELO Fijaciones SL**
C/Rossello 7
08211 Castellar del Valles, Spain

with the purpose, scope, conditions and terms set out in the Annex, which forms an integral part of this CNBOP–PIB National Technical Assessment

is positive.

Valid:
From February 7, 2023
To February 6, 2028

Deputy Director For Certification And Approvals
/illegible signature/
Senior Foreman, Jacek Zboina, PhD Eng.

Annex:
General And Technical Provisions

/round stamp with the emblem of the Polish Republic in the center and the following circumscription/:
Józef Tuliszkowski's Scientific and Research Center For Fire Protection, National Research Institute

Józefów, November 15, 2022

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GENERAL AND TECHNICAL PROVISIONS

1.Technical description of the product

1.1 General technical description of the product

The subject of this national technical assessment are **CELO cable assemblies (cable supporting structures including wires and cables) of E30, E60, E90 class of sustained electrical function according to DIN 4102-12:1998 1998**– sets of products consisting of CELO cable supporting structures indicated in Table 1 and cables of manufacturers indicated in Table 2.

CELO cable assemblies ensure **continuity of electricity supply or signal transmission under fire conditions** for the time required for start-up and operation of fire protection equipment[1], classified in **E30, E60, E90 class of sustained electrical function** according to DIN 4102-12:1998, depending on the kind and type of cable supporting structure and the kind and type of cable used.

The sustained function of cable assembly should be understood as its ability of sustained transmission of electric power and IT signals (e.g. in emergency power paths) at the temperature of fire determined by the standard time-temperature curve (ETK) for 30, 60 or 90 minutes and under static nominal load.

CELO cable assemblies are

- normative assemblies, whose structure complies with clause 7.3.3.3 of the DIN 4102-12:1998 standard
- special (supernormative) assemblies with parameters other than those specified in clause 7.3.3.3 of the DIN 4102-12:1998 standard with regard to the method of attachment, thickness of the material, type of substrate, type of materials and type of coating, e.g. mesh trays, structures with greater spacing between suspension points, etc.

Assessment of CELO cable assemblies in terms of maintaining electrical functions (ensuring continuity of electricity supply or signal transmission), taking into account the type of substrate and the intended method of attachment to it, is carried out in accordance with the conditions specified in the Polish Standard regarding testing fire resistance: PN-EN 1363-1 and PN-EN 1363-1:2020-07 Testing fire resistance – Part 1. General requirements and those in DIN 4102-12:1998 standard. Fire characteristics of construction materials and elements – Part 12: Maintaining electrical functions of

[1] According to the regulation of the Minister of Infrastructure on technical conditions to be met by buildings and their location of April 12, 2002, (consolidated text of the Journal of Laws of 2022, item 1225 as amended).

cable assemblies – Requirements and tests. The procedure of testing normative and special cable assemblies complies with DIN 4102-12:1998 standard.

Scope of use of CELO cable assemblies is limited to cables with the nominal voltage up to 1 kV.

Cable assemblies, subject to **clause 2.2 of this National Technical Assessment**, may comprise CELO cable supporting assemblies indicated in the Table 1 and the types of cable of the manufacturers listed in the Table 2.

Annex 1 shows drawings of normalized CELO cable supporting structures and classifications of cable assemblies according to DIN 4102-12:1998 standard, depending on the normalized cable supporting assembly and the cable.

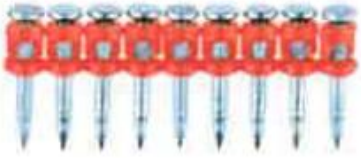
Annex 2 shows drawings of special cable supporting structures CELO and classifications of cable assemblies according to DIN 4102-12:1998 depending on used configuration of special cable supporting structure and the cable.

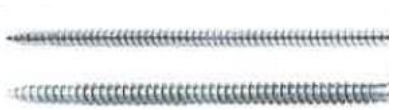
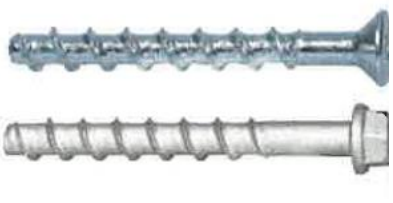
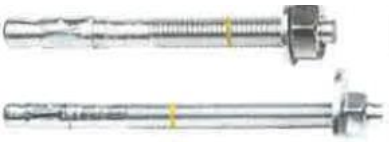
Table 1

No.	Assortment varieties	Scope of use/surface	Product picture	Product material
1	LI	Clamps for attaching cables, pipes (and cables in electrical conduits). Can be mounted with ATR(TR, ATV/TV, MH and other accessories or with screws and anchors. Surface: Depending on the CELO mounting element. Max. load 2.5 kg/m		Zinc-electroplated steel ≥ 5µm
2	L	Clamps for attaching cables, pipes (and cables in electrical conduits). Can be mounted with ATR(TR, ATV/TV, MH and other accessories or with screws and anchors. Surface: Depending on the CELO mounting element. Max. load 7.5 kg/m		Zinc-electroplated steel ≥ 5µm
3	LD	Double clamp attaching cables, pipes (and cables in electrical conduits.) Can be mounted with ATR/TR,		Zinc-electroplated steel ≥ 5µm

		ATV/TV, AAT and other accessories or with screws, bolts and anchors. Surface: depending on the CELO mounting element Max. load 2.5kg/m Max. 8 cables in the clamp (2 x 4)		
4	CH	CH cable clamp for attaching cables, pipes (and cables in electrical conduits). CELO mounting element depending on the surface.		Galvanized steel, thickness 0,75 mm
5	CHS	CHS cable clamp for attaching cable and cable bundles (and cables in electrical conduits). Mounting element: XHA or CELO nails depending on the surface. Maximum load 5kg/m		Galvanized steel, thickness 0,80 mm
6	DFT	Brackets for attaching cables (bundles (and cables in electrical conduits) using XHA nails Max. load 2.5kg/m		Zinc-electroplated steel ≥ 5µm
7	PFT	Brackets for attaching cables (bundles (and cables in electrical conduits) using XHA nails Max. load 2.5kg/m		Zinc-electroplated steel ≥ 5µm
8	FT	Brackets for attaching cables (bundles (and cables in electrical conduits) using XHA nails Max. load 2.5kg/m		Zinc-electroplated steel ≥ 5µm
9	DF	Brackets for attaching cables (bundles (and cables in electrical conduits). Surface: depending on the CELO mounting element Max. load 2.5kg/m		Zinc-electroplated steel ≥ 5µm
10	F	Brackets for attaching cables (bundles (and cables in electrical conduits). Surface: depending on the CELO mounting element Max. load 2.5kg/m		Zinc-electroplated steel ≥ 5µm

11	CC	Metal clip for steel beams 1.0-12.0 mm thick		Zn-Al >240HNS organic coating or painted black
12	CA	Perforated CA tape. Can be used with CELO gas-powered nailers. Surface: depending on the CELO mounting element.		Zinc-plated carbon steel
13	Multitub MT	Multitub MT clamp attaching for cables with PTTR profile Load capacity of the construction with PTTR profile max. 10kg/m		Zinc-plated carbon steel + polyamide 6

		ANCHORING ELEMENTS		
14	ATR/TR	Fastener for attaching threaded elements. Surface: depending on CELO mounting elements (i.a. XHA nails)		Plastic handle made of HDPE, the other part: zinc-electroplated steel ≥ 5µm
15	ATV/TV	Fastener for suspending threaded elements. Surface: depending on CELO mounting elements (i.a. XHA nails)		Plastic handle made of HDPE, the other part: zinc-electroplated steel ≥ 5µm
16	AAT	Fastener for suspending with an eyelet. Surface: depending on CELO mounting elements (i.a. XHA nails)		Plastic handle made of HDPE, the other part: zinc-electroplated steel ≥ 5µm
17	AW	Metal washer		Zinc-electroplated steel
18	XHA	XHA nails, depending on the size, designed for: concrete class ≥ C15/20, concrete blocks, prestressed concrete, aerated concrete, brick, lime-sand brick, steel surfaces (thickness ≥ 3mm		Zinc-electroplated steel (hardness 54-55 HRC) ≥ 5µm

19	DIN 7504K	Screw for mounting brackets: DF, F, and CH clamps to steel profiles and sheet steel and other components.		Hardened zinc-electroplated steel
20	AGRP 7504N	Screw for mounting brackets: DF, F, and CH clamps to steel profiles and sheet steel.		Hardened zinc-electroplated steel
21	TIRAFONDO -TF	Screw for attaching threaded parts using MSO sleeves		Zinc-electroplated steel
21	TORNIGRAP - TG	Screw for mounting DF, F clamps using i.a.. MSO sleeves		Hardened zinc-electroplated steel
23	BTS 5/ BTS 6	Screw for concrete class ≥ C15/20, stone, solid and perforated brick, lime-sand block. Installation of L, CH, DF, F clamps, routes and cable trays, threaded rods		Mande of hardened steel. Zn-Al > 240HNS organic coating
24	FBS	Screw for concrete class ≥ C15/20, stone, solid and perforated brick, lime-sand block.		Hardened zinc-electroplated steel
25	TORAB ST	Self-drilling screw with M6 and M8 thread for mounting in steel and sheet steel		Zinc-electroplated steel ≥ 5µm
26	BTS	Screw for concrete class ≥ C15/20, stone, solid and perforated brick, lime-sand block. Mounting profiles, cable trays.		Mande of hardened steel. Zn-Al > 240HNS organic coating and A4 steel
27	BAP	Anchor for structural mounting for concrete class ≥ C15/20, for natural stone with compact structure		Zinc-electroplated steel

28	DNBOLT (DT, DV, DG, DA)	DNBOLT DT DV DG DA anchor bolt for mounting in concrete, concrete blocks, brick, sand-lime blocks, stone		6.8 and 8.8 Zinc-electroplated steel according to ISO/DIN 989-1
29	DA	Anchor for concrete of class ≥ C15/20, for solid brick, sand-lime brick		Zinc-electroplated steel
30	SAP/SAPK	Sleeve for concrete class ≥ C15/20		Zinc-electroplated steel
31	MSD	Sleeve for concrete class ≥ C15/20, stone, solid brick, lime sand brick, concrete blocks, aerated concrete, elements with cavities of wall thickness ≥ 2 cm, using TF, TG screws		Zinc-electroplated steel
32	RESI AST	AST threaded rod for mountings with VY RESIFIX chemical mortar		5.8 Zinc-electroplated steel A4 Stainless steel
33	BT/BTLO	Bracket for mountings in plasterboard and cavities		Zinc-electroplated steel ≥ 5µm PS and PP plastic
34	HRM	Bracket for mountings in plasterboard and cavities		Zinc-electroplated steel ≥ 5µm
35	GKDZ/GKDZPZ	Dowel for mounting in plasterboard		Zinc-electroplated steel
36	MH	Threaded fastener to connect threaded parts. Surface: depending on the CELO mounting component		Zinc-electroplated steel

37	CMV	Metal clip for steel beams with M6 thread and 6.3mm mounting hole for cable ties. Steel beam thickness 1.0-16.0 mm		Zn-Al > 240HNS organic coating
38	CVA	Metal clip for steel beams with M6/M8 thread. Steel beam thickness 1.5-20.0 mm		Zn-Al > 240HNS organic coating or painted black
39	CAB	Metal clip for steel beams with M6 x19 thread. Steel beam thickness 3-20.0 mm		Zn-Al > 240HNS organic coating or painted black
40	CBR	Metal clip for steel beams with 9x3 mm hole for cable ties. Steel beam thickness 1.5-20.0 mm		Zn-Al > 240HNS organic coating
41	CAL	Metal clip for steel beams with 6,3 mm hole for cable ties or steel lines. Steel beam thickness 1.5-20.0 mm		Zinc-plated carbon steel
42	ECT	M6x20 double threaded connector		Zinc-plated carbon steel
43	DIN975	4.8 M4-M12 class threaded rod		Zinc-plated carbon steel
44	DIN934	Nut made of class 8 steel		Zinc-plated carbon steel

45	AAN	Steel washer, thickness 1.6-2.0 mm		Zinc-plated carbon steel
46	PTTR	PTTR profile for MT clamp. Surface: depending on CELO mounting component.		Zinc-plated carbon steel

Table 2

No.	Manufacturer	Cable types
1	**TECHNOKABEL S.A** **Ul. Nasielska 55** **04-343 Warsaw** **Poland**	NHXH FE180 PH90/E90, NHXCH FE180 PH90/E90 (N)HXH FE180 PH90/E90 HTKSH PH90, HTKSHekw PH90 HDGs FE180 PH90/E30-E90, HDGsekw FE180 PH90/E30-E90 HDGszo FE180 PH90/E30-E90 HDGs-W FE180 PH90/E30-E90 HLGs FE 180 PH90/E30-E90 HLGsekw FE 180 PH90/E30-E90
2	**Zakłady Kablowe BITNER** **Sp. z o.o** **Ul. Friedleina 3/3** **30-009 Cracow** **Poland**	(N)HXH FE180/E90 BITflame 1000 FE180/PH90/E90, HTKSH FE180 PH90/E90, HTKSHekwFE180 PH90/E90 HDGs FE180 PH90/E90, HDGseqf FE180 PH90/E90 HLGs FE180/PH90/E90
3	**ELKOND HHK a.s** **Oravicka 1228,** **028 01 Trstena,** **Slovakia**	1-CXKH-V-J RE P90-R
4	**PRAKAB PRAZSKA KABELOVNA** **KE Kabla 278,** **CZ-10209 Prague,** **Czech Republic**	PRAFlaDur® 90 (N)HXH FE180/ P90-R ... PRAFlaGuard® F SSKFH-V180 P90-R ...
5	**VUKI a.s., Rybnicna 9985/38,** **831 07 Bratislava,** **Slovakia**	JE-H(St)H PS90

1.1.1 **Name of the production plant and its address:**

CELO cable supporting assemblies are produced in the following production plants:
CELO Fijaciones SL
C/Rossello 7
08211 Castellar del Valles
Spain

- CELO Suzhou Precision Fasteners Co. Ltd., 166 Ningbo Road, Taicang, Economic Development Area of Jiangsu Province, 215400, Jiangsu, China
- CELO Fijaciones SL., C/Rossello 7, 08211 Castellar del Valles, Spain
- CELO Befestigungssysteme GmbH, Industriestrasse 6, 86551 Aichach, Germany

Lines and cables are produced in the following production plants:

- TECHNOKABEL S.A., ul. Wiatraczna 28, 06-550 Szreńsk k/Mławy, Poland
- Zakłady Kablowe BITNER Sp. z o.o., ul. Krakowska 2, 32-353 Trzyciąż, Poland
- ELKOND HHK a.s., Oravicka 1228, 028 01 Trstena, Slovakia
- PRAKAB PRAZSKA KABELOVNA, a.s. KE Kabla 278, CZ-10209 Prague, Czech Republic
- VUKI a.s., Rybnicna 9985/38, 831 07 Bratislava, Slovakia

1.2 Division

Cable supporting structures that are part of the CELO cable assemblies are made depending on the protection against corrosive atmosphere. Products are available in two material versions:

- electro-galvanized steel according to PN-EN ISO 2081 and PN-EN 10327;
- hot dip coated steel according to standard PN-EN 1461.
- acid-proof steel,
- zinc flake coating PN-EN ISO 10683:2014-09.

Selected types and markings of cables included in CELO cable assemblies are presented in Table 3.

Table 3

Designation	Description
NHXH	Power cable (N) with copper conductors and double insulation made of mica tape and cross-linked halogen-free flame retardant, low smoke generation material (HX), filling and coating of halogen-free, flame retardant, low-smoke generation material (H).
NHXCH	Power cable (N) with copper conductors and double insulation made of mica tape and cross-linked halogen-free flame retardant, low smoke generation material (HX), filler and coating of halogen-free, flame retardant, low-smoke generation plastic (H), with coaxial conductor in the form of spiral braid on the filler coating (C)
(N)HXH	Power cable (N) with copper conductors and double insulation made of, flame retardant, low smoke generation silicon rubber (HX), filler coating and coating of halogen-free, flame retardant, reduced smoke generating material (H).
HTKSH	Telecommunications (T) station (S) cable (K), unscreened, with solid copper conductors, with insulation of halogen-free, low smoke generation material (H) and coating of halogen-free, low smoke generation material (H)
HTKSHeq	Telecommunications (T) station (S) cable (K), screened, with solid copper conductors, with insulation of halogen-free, low smoke generation material (H) and coating of halogen-free, low smoke generation material (H)
HDGs	Cable with solid copper conductors (D) with special silicone rubber insulation (Gs) and coating of halogen-free, flame retardant, low smoke generation material (H)
HDGseq	Cable with solid copper conductors (D) with special silicone rubber insulation (Gs) and coating of halogen-free, flame retardant, low smoke generation material (H) and with a common screen on the center (eq).
E30 **E60** **E90**	The cable, together with the defined cable support structure (cable assembly), capacity to maintain electric function in minutes (test according to DIN 4102-12:1998)

FE180	The cable capacity to maintain continuity of the circuit (actual conduction of current or signal transmission) in minutes (test according to PN-IEC 60331-21:2003 in static conditions at 750° C)
PH30 **PH90**	The cable capacity to maintain continuity of the circuit (actual conduction of current or signal transmission) according to PN-EN 136-1:2012 in minutes (test according to PN EN 50200:2016-01)

1.3 Markings

CELO cable supporting structures are identified by the CELO product catalog.

Placing the product symbol on the elements is impossible due to production technology.

Product marking appears on packaging and provides the following information:

Manufacturer's name or trade mark	CELO
Product code	Depending on the element
Product name	Depending on the element
Number of pieces per package	Depending on the element

The marking of wires and cables consists of:

- the cable symbol together with the specification of: (number of pairs) x (number of conductors in a pair) x (diameter of the conductor),
- manufacturer's mark,
- year of production

2. INTENDED USE OF THE PRODUCT

2.1 Intended use

CELO cable supporting structures together with electric cables of indicated producers listed in Table 2 of this national technical assessment can be used as cable assemblies in systems for supplying and controlling devices used for fire protection.

The cable assemblies described in this national technical assessment are classified as E30, E60, E90 according to DIN 4102-12:1998 standard and according to § 187.3 of the regulation of the Minister of Infrastructure of April 12, 2002 on technical conditions to which the buildings and their location should conform (consolidated text of the Journal of Laws of 2022, item 1225, as amended), as ensuring the continuity of electricity supply or signal transmission for the time required for starting-up and operating the device, defined as 30, 60 and 90 minutes respectively.

Assessment of cable assemblies with respect to continuity of power supply or signal transmission, taking into account the type of surface and the intended method of fastening to it, was performed in accordance with the conditions specified in the Polish Standard for fire resistance testing - PN-EN 1363-1:2012 and PN-EN 1363-1:2020-07 Fire resistance testing - Part 1 General requirements, and in DIN 4102-12:1998 Fire behavior of building materials and elements - Part 12: Fire resistance of electric cable systems required to maintain circuit integrity - Requirements and testing.

2.2. Range and conditions of use, limits

It is allowed to use conductors, cables, fixings and installation boxes in cable assemblies provided that:

- they meet the requirements of this national technical assessment, which should be confirmed by positive results of tests of cable assemblies (cable with mounting according to Annex 1 and 2 of this national technical assessment) according to PN-EN 1363-1:2012, PN-EN 1363-1:2020-07 and DIN 4102-12:1998, and
- if the manufacturers or suppliers of conductors and cables have made the assessment of conformity of performance of the product, which resulted in issuing a certificate of conformity to the technical approval for the product or a national certificate of constancy of performance for conformity with the national technical assessment for the product.

Cable assemblies may use anchors/pins/screws/nails with proven fire resistance in the respective material. The confirmation shall be documented by a suitable document depending on the assessment system (for assessment system 1 the certificate of conformity or the certificate of constancy of performance or national certificate of constancy of performance, for system 2+ European Technical Approval or European Technical Assessment or National Technical or National Technical Approval or National Technical Assessment).

2.3 Use, installing and maintenance

CELO cable assemblies should be mounted to concrete surface of class ≥ C25 or natural stone, masonry surface (e.g. of solid ceramic brick, brick, lime-sand brick, blocks of concrete and autoclaved aerated concrete), to steel structures or to steel sheet. It is allowed to mount cable assemblies to other substrates with adequate strength confirmed by a certificate of bearing capacity equal at least to the resistance of cable assemblies.
Basic parameters of mounting cable handles and clamps are shown in Table 4.

2.3.1. Limit Conditions:

1. Brackets or outriggers shall be attached to a solid ceiling or wall with ground-matched certified studs in accordance with manufacturer's recommendations.

2. M8, M10, M12 sleeves and studs shall be recessed into concrete a minimum of 60 mm, and M6 a minimum of 30 mm into the concrete, unless the fire resistance document indicated in clause 2.2 specifies otherwise. The tension force per dowel should not exceed 500 N. Alternatively, dowels and nails whose suitability in terms of fire safety has been documented may be used. Alternatively, dowels or nails whose suitability in terms of fire safety has been documented can be used. In each case the installation instructions of the manufacturer of the approved anchors must be followed.

3. It should be ensured that CELO cable assemblies are not affected in their class of functionality maintenance by falling construction elements.

4. CELO cable assemblies may be applied as suspended structures - fixed to ceilings and flat roofs, wall mounted to walls horizontally, vertically or diagonally. Fixing to steel structures is also permitted.

2.3.2. CELO cable assemblies are permitted to:

1. Be fastened to another surface of at least the same fire resistance class (fire protection rating related to load bearing R30, R60, R90) as the cable assembly, using certified anchoring elements suitable for that surface and load of the certified anchoring elements,

2. DFT, PFT, PFTX, F, DF clamps can be flush mounted (minimum groove depth 15 mm).

2.3.3. CELO cable assemblies are prohibited from:

1. Using a common support structure for a route that is an E90 cable assembly and a route without a fire function.

2. Configuring routes using items in Table 1 but not included in Annexes 1 and 2.

Permissible loads and technical parameters of CELO cable supporting structures should conform to Table 4.

Table 4

BASIC PARAMETERS OF MOUNTING CABLES IN BRACKETS/CLAMPS ON FLAT ROOFS, HORIZONTALLY ON WALLS OR ON STEEL PROFILE		
PARAMETER NAME	**PARAMETER VALUE**	
BRACKETS AND CABLE CLAMPS		
Bracket and clamp types	FT, PFT, DFT, F, DF,	L, LD, LI, CH, CHS
Diameters of cable that can be mounted in brackets and clamps	The maximum diameter of a cable should be compatible with the maximum dimension of the bracket, not greater than 50 mm	Single cable: from 4 mm to 50 mm and L bundle: up to 7.5 kg/m LD bundle: up to 2.5 kg/m LI bundle: up to 2.5 kg/m CH bundle: up to 6 kg/m CHS bundle: up to 5 kg/m
Max. spacing of brackets and clamps	300 mm, 600 mm	300 mm, 600 mm
Mounting	Mounting elements and allowed kinds of surfaces compatible with Table 1	Mounting elements and allowed kinds of surfaces compatible with Table 1

3. PRODUCT PERFORMANCE AND METHODS USED FOR ITS ASSESSMENT

3.1. Maintaining electric functions of the cable assembly

Table 5

No	**Properties**	**Requirements**	**Test methods**
1	Maintaining electric functions of the cable assembly (assurance of continuity of power supply or signal transmission for	E30, E60, E90 class According to DIN 4102-12:1998	PN-EN 1363-1:2012 / PN-EN 163-1:2020-07 and DIN 4102-12:1998

	the time required for the start-up and operation of the fire protection equipment)	30, 60 and 90 minutes according to Polish regulations	

4. PACKAGING, STORAGE, TRANSPORT AND LABELLING OF THE PRODUCT

4.1 Packing

CELO Cable supporting structures

Components of CELO cable supporting structures should be placed in unit or collective packaging that protects them from mechanical damage and environmental effects, and then transported, limiting the possibility of free movement and protecting them from damage during handling and transport.

The packaging should be marked with the following data, among others:

- manufacturer's name or mark;
- product code;
- name of the product;
- quantity in package

Cables

Factory made sections of cables should be tightly terminated.

Packing of cables should be done according to the requirements of PN-E-79100:2001 standard.

4.2. Transport

CELO cable supporting structures

Transport of CELO supporting structure elements, packed according to clause 4.1 can be done by any transport means. Supporting construction elements should be protected against mechanical damage and relative humidity higher than 95% at +40°C, according to requirements of valid transport regulations.

Cables

Cables should be transported in accordance with the requirements of PN-E-79100:2001.

4.3 Storage

CELO cable supporting structures

The elements of CELO cable supporting structures should be stored according to the following conditions:

1. Products in delivery (i.e. in original packaging) should be stored in dry and well-ventilated rooms.

2. During storage they should be protected against rapid changes in humidity and temperature, which can cause steam condensation. Failure to do so may result in appearance of white spots (zinc oxides).

3. If it is necessary to place the products in the open air for a short period of time, it is necessary to provide for drainage. Use a ventilating cover.

4. If the products get wet, they must absolutely be dried (separate each piece so that it does not come into contact with another one and place in a dry airy place until dry) before storage.

Cables

Storage of cables should be in accordance with the requirements of PN-E-79100:2001.

4.4 Method of product marking

The marking of the product and its packaging, before placing it on the market should contain the information required in this National Technical Assessment CNBOP-PIB.

4.4.1 Construction product marking

Product marking shall be carried out in accordance with the guidelines laid down in the regulation of the Minister of Infrastructure of November 17, 2016 on the manner of declaring the performance of construction products and the method of marking them with the construction product mark (Journal of Laws 2016, item 1966, as amended):

§ 10.

1. The manufacturer shall label a construction product with a construction mark before it is marketed or made available on the domestic market.

2. The construction mark shall be affixed visibly, legibly and indelibly directly to the construction product or to a label attached to the product.

3. If the construction mark cannot be affixed in the manner specified in paragraph (2) due to the size or nature of the construction product, the construction mark shall be affixed on the packaging or collective package of the construction product, or on the documents accompanying the product.

§ 11.1.

1) two last digits of the year in which the construction mark was first affixed on the construction product;

2) name and address of the registered office of the manufacturer or identification mark allowing to uniquely identify the name and address of the registered office of the manufacturer

3) name and indication of the type of construction product;

4) number and year of the National Technical Assessment according to which the performance was declared;

5) number of the national declaration of performance;

6) level or class of the declared performance;

7) name of the certification body, if such body was involved in the assessment of the verification of constancy of performance of the construction product;

8) address of the manufacturer's website, if the national declaration is available on it.

§12.

Construction product, which bears a construction mark, may bear other markings, signs and inscriptions, if they do not limit visibility and legibility of the construction mark and information referred to in § 11, and their meaning and graphic form are not misleading.

4.4.2 Marking by type, characteristics and intended use of the product

CELO cable supporting structures are identified on the basis of the company's product catalog.

It is impossible to put the product symbol on all the elements because of the technology; only selected products are mechanically marked with the product symbol or the company logo.

4.4.3 Marking of product packaging with respect to its type, characteristics and intended use

The packaging of the product which is the subject of this National Technical Assessment should bear at least the following information:

- construction mark, conditionally according to the guidelines in clause 4.4.1;
- manufacturer's name or mark;
- product code;
- the name of the product;
- quantity per package.

5. ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

5.1 General principles

In accordance with Article 4, Article 5(2) and Article 8(1) of the Act of April 16, 2004 on construction products (Journal of Laws of 2021, item 1213), a product covered by this National Technical Assessment may be marketed and used in execution of construction works to the extent corresponding to its performance and intended use. If the manufacturer has assessed and verified the constancy of performance and by issuing a national declaration of performance for a construction product he has declared, under his sole responsibility, that the performance of the product is in accordance with the **CNBOP-PIB National Technical Assessment No. CNBOP-PIB-KOT-2018/2022/0037-3703 1st edition** and has marked the product with the construction mark.

In accordance with the regulation of the Minister of Infrastructure and Construction of November 17, 2016 on the manner of declaring the performance of construction products and the manner of marking them with the construction mark (Journal of Laws of 2016, item 1966, as amended) the assessment and verification of constancy of performance of **CELO cable assemblies (cable supporting structures together with electric wires and cables) with E30, E60, E90 electric function support class according to DIN 4102-12:1998** is carried out by the manufacturer using the **system 1+ assessment and verification of constancy of performance** which means certification of conformity of performance of the product by an accredited certification body on the basis of:

1) the manufacturer's activities, include determination of the construction product type and carrying out:

a) factory production control,

b) testing of samples taken by the manufacturer at the production plant in accordance with the prescribed test plan;

2) assessment and verification by an accredited certification body, includes:

a) carrying out an initial inspection of the manufacturing plant and factory production control production control,
b) issuing the national certificate of constancy of performance,
c) continuation of surveillance, assessment and evaluation of factory production control,
d) audit-testing of samples taken by the certification body at the factory or at the manufacturer's storage facilities.

5.2 Factory production control (FPC)

5.2.1 General provisions

The manufacturer shall establish, document and maintain a FPC system to ensure that products placed on the market conform to the established performance characteristics.

The FPC system shall include written procedures, regular inspection and testing and/or evaluation and use of the results to control raw materials and other incoming materials or components, equipment, the manufacturing process and the product.

All elements, requirements and provisions adopted by the manufacturer should be systematically documented in the form of written policies and procedures. This production control system documentation shall ensure a general understanding of the conformity assessment and enable the achievement of the required product performance, as well as the verification of the effectiveness of the production control system.

The factory production control shall use both operational techniques and all activities enabling to maintain and control the conformity of the product performance with this National Technical Assessment

5.2.2 Requirements

The construction product covered by this National Technical Assessment should be manufactured in accordance with a factory production control system.

The manufacturer shall establish, document, implement and maintain a factory production control system in order to ensure the constancy of performance of the construction product, as set out in this in this National Technical Assessment CNBOP-PIB.

The factory production control documentation shall include:

a) organizational structure,
b) personnel requirements (qualifications, authorization, responsibility for individual elements of factory production control, training) elements of factory production control, training),
c) management reviews performed by the management,
d) supervision over documentation and records,
e) control and testing plans for raw materials, requirements,
f) control plans and tests of finished product,

g) supervision of production equipment,
h) supervision of inspection and testing equipment with measurement consistency,
i) supervision of the production process, including conducted inter-operational inspections and tests,
j) description of subcontracted work and procedure for their supervision,
k) treatment of non-conforming products and complaints, conducting corrective actions,
l) description of the method of packaging, transport and storage and the method of marking the product.

Factory production control documentation should be supplemented with technical documentation, technical specifications (product standards, testing standards, European or national technical assessments, etc.), legal regulations.

A quality management system complying with the requirements of ISO 9001 may be considered a factory production control system if the requirements of this National Technical Assessment are also fulfilled.

5.3 Initial type-testing

Initial type testing is a test confirming the required performance of a construction product performed before placing the product on the market and putting it into service, and each change of raw material or sub-assemblies and production technology, as well as changes in the FPC system, if they affect the performance of the product.

On the basis of the system **+1 of assessment and verification of constancy of performance** adopted for the product covered by this National Technical Assessment and in accordance with § 5 of the regulation of the Minister of Infrastructure and Construction of November 17, 2016 on national technical assessments (Journal of Laws 2016, item 1968) the initial type testing should be performed by:

1. An accredited testing laboratory in accordance with the Act of April 13, 2016. on conformity assessment and market surveillance systems or;
2. A foreign laboratory if it results from international agreements or;
3. A laboratory notified in accordance with the Regulation of the European Parliament and of the Council (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonized conditions for the marketing of conditions for the marketing of construction products and repealing Council Directive 89/106/EEC or;
4. Another laboratory with which the assessment body has concluded an agreement on recognition of results of tests and calculations.

The assessment body may accept the results of tests and calculations provided by the applicant, carried out by national or foreign laboratories other than those mentioned above.

The scope of the preliminary type examination shall include the test given in clause 3.

Positive test results obtained in an accredited laboratory, which in the procedure of issuing the **CNBOP-PIB-KOT-2018/2022/0037-3703 National Technical Assessment 1st edition** were the basis to determine the performance of the product, were recognized as preliminary type testing in the assessment and verification of constancy of performance of the product.

5.4 Testing of finished products

The test plan for finished products includes ongoing tests, periodic tests and control tests.

5.4.1 Ongoing tests

Ongoing tests are internal production control, in result of which the manufacturer ensures compliance of the technical properties of the product with the provisions of the National Technical Assessment.

The scope of tests is given in Table 6.

Table 6

No.	Kind of test	Requirements	Test method
1	External appearance, dimensions, marking	Compatible with manufacturer's documentation	Inspection

The results of current tests shall be systematically recorded and the records of the register shall confirm that the products meet the conformity assessment criteria. Each batch should be unambiguously identifiable in the test register.

The manufacturer should indicate in the factory production control documentation, what percentage (not less than 1%) of the product samples will be used for current tests. If within one batch of products there are different varieties (versions) of the product, then tests should be carried out for each of the varieties.

5.4.2 Periodic tests

Tests must be performed to periodically control the quality of products and to confirm the stability of production at least once every 3 years.

Range of tests according to table 7.

Table 7

No	Kind of test	Requirements	Testing method
1	External appearance, dimensions, marking	Compatible with manufacturer's documentation	Inspection
2	Maintaining electric functions of the cable assembly* (assurance of continuity of power supply or signal transmission for the time required for the start-up and operation of the fire protection equipment)	E30, E60, E90 class According to DIN 4102-12:1998 30, 60 and 90 minutes according to Polish regulations	PN-EN 1363- 1:2020-7 and DIN 4102-12:1998

*Testing should be performed in the case of changes in the design covered by this National Technical Assessment.

5.4.3 Control tests

In accordance with the regulation of the Minister of Infrastructure and Construction of November 17, 2016 on the manner of declaring the performance of construction products and the manner of construction products and the method of marking them with the construction mark (Journal of Laws

2016, item 1966, as amended) and specified for the product covered by this National Technical Assessment CNBOP-PIB system 1 + of assessment and verification of constancy of and verification of constancy of performance control tests of the product shall be carried out.

The control tests shall be carried out not less frequently than once every 3 years.

The scope of tests is given in Table 8.

Table 8

No.	Kind of test	Requirements	Test method
1	External appearance, dimensions, marking	Compatible with manufacturer's documentation	Inspection

5.5. Methods of testing

Testing of products shall be carried out by the methods given in clauses 3 and 5.4 of this National Technical Assessment. The results obtained shall be compared with the requirements given in those clauses.

During sampling and preparation of the samples and during testing, the following shall be ensured environmental conditions specified in the normative documents specified in the environmental conditions shall be as specified in the normative documents listed in clauses 3 and 5.4 of this National Technical Assessment.

5.6 Sampling for Testing

Samples for testing shall be taken randomly in accordance with PN-N-03010:1983 or another equivalent standard.

5.7 Evaluation of test results

The manufactured products shall be considered to conform to the requirements of this National Technical Assessment if the results of the test in point 3 are positive. In the assessment of the results, the results of previously performed tests in accredited laboratories shall also be taken into account if the test methods and exposure conditions are in accordance with the requirements of this National technical assessment.

6. INSTRUCTION

6.1 CNBOP-PIB-KOT-2018/2022/0037-3703 National Technical Assessment 1st edition is a document stating positive assessment of the performance characteristics for the intended use of the set of CELO **cable assemblies (cable supporting structures together with conductors and electric cables) with E30, E60, E90 electric function maintenance class according to DIN 4102-12:1998** in the scope resulting from the provisions of this National Technical Assessment.

6.2 The set of performance characteristics recorded in the National Technical Assessment and their required level shall constitute the basis for the manufacturer to assess and verify the constancy of performance of the product and to issue, under his sole responsibility, the national declaration of performance.

6.3 CNBOP-PIB-KOT-2018/2022/0037-3703 National Technical Assessment 1st edition shall confirm positive assessment of the product as manufactured by the Manufacturer and submitted by the Applicant to the procedure on issuing the National Technical Assessment. Procedure on issuing a National Technical Assessment do not change or improve the product by assigning to it other requirements than those declared by the Manufacturer or other ways of testing performance other than those actually used in the manufacture of the product in type tests and in ongoing production control.

6.4. The National Technical Assessment is not a document authorizing to mark the construction product before placing it on the market.

6.5 The product shall be delivered to the client in accordance with the conditions for packaging, storage and transport indicated in clause 4 of this National Technical Assessment. This condition applies to the Supplier at all stages of distribution of the product from the manufacturer to the end user.

6.6 The National Technical Assessment does not release the manufacturer from the responsibility for the quality of the construction product, each batch of that product and its individual components, and contractors from the responsibility for their proper application.

6.7. Guarantee for construction product covered by this National Technical Assessment shall be granted by the Supplier on the basis of separate provisions.

6.8 The content of brochures, announcements and other documents related to marketing and use in construction industry of the product covered by this National Technical Assessment shall include information about the **CNBOP-PIB-KOT-2018/2022/0037-3703 National Technical Assessment 1st edition** granted to the product.

6.9 The CNBOP-PIB Technical Assessment does not infringe the rights arising from industrial property protection regulations, in particular the Act of 30 June 2000 Industrial Property Law (consolidated text of the Journal of Laws of 2021, item 324). Ensuring these rights is the responsibility of the user of this National Technical Assessment.

6.10. It is the manufacturer's responsibility to verify that the solution being the subject of the Technical Assessment does not infringe rights of third parties.

6.11 Liability for damage caused to anyone as a result of product defectiveness shall be borne by Manufacturer.

6.12 CNBOP-PIB, by issuing a National Technical Assessment, is not responsible for possible breach of exclusive and acquired rights.

6.13 CNBOP-PIB may make changes to the performance characteristics stated in this National Technical Assessment. It requires a written request with justification submitted by the Applicant and conducting a procedure in the scope appropriate to modifications. It is unacceptable to make any changes to the content of the National Technical Assessment other than in modes specified above.

6.14 The CNBOP-PIB may repeal the National Technical Assessment in the case of changes in separate regulations, standards and regulations established by international organizations, if it results from the concluded agreements, significant changes in the scientific basis and the state of the art and failure to confirm, during use, the positive assessment of the performance for intended use of the construction product. National Technical Assessment may be abolished on CNBOP-PIB own initiative

or at the request of General Construction Inspector, after carrying out explanatory procedure with participation of the applicant.

7. LIST OF DOCUMENTS USED IN THE PROCEDURE

Standards and related documents

PN-EN 1363-1:2012
Fire resistance testing - Part 1: General requirements
PN-EN 1363-1:2020-07
Fire resistance testing - Part 1: General requirements
DIN 4102-2:1997
Fire behavior of building materials and elements - Part 2: Building elements, definitions, requirements and tests
DIN 4102-4:2016
Fire performance of building materials and components - Part 4: List and use of classified building materials, building components and special building elements
DIN 4102-12:1998
Fire performance of building materials and components - Part 12: Functional integrity of electrical cable assemblies - Requirements and tests
PN-E-79100: 2001
Electric cables - Packaging, storage and transport
PN-N-03010:1983
Statistical quality control - Random selection of the units to be sampled

Reports, test reports, evaluations, classifications, used in the procedure for issuing a National Technical Assessment

Test reports:

1. FIRES-FR-064-14-AUNE of 05.05.2014
2. FIRES-FR-043-16-AUNE of 28.04.2016
3. FIRES-FR-142-17-AUNE of 31.08.2017
4. FIRES-FR-175-18-AUNE of 07.09.2018
5. FIRES-FR-098-19-AUNE of 13.06.2019
6. FIRES-FR-032-20-AUNE of 10.03.2020
7. FIRES-FR-183-20-AUNE of 15.12.2020
8. FIRES-FR-169-21-AUNE of 08.08.2021

Performed in Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia

Classifications:

- FIRES-JR-025-21-NURE of 17.03.2021
- FIRES-JR-028-21-NURE of 17.03.2021
- FIRES-JR-119-18-NURE of 09.10.2017
- FIRES-JR-069-19-NURE of 15.07.2019
- FIRES-JR-023-20-NURE of 15.06.2020
- FIRES-JR-143-20-NURE of 17.03.2021
- FIRES-JR-075-21-NURE of 06.09.2021

Performed in Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia

Documentation

No.	Document name	Document number	Date
1	Application for prolongation of the National Technical Assessment, including annexes	0072/DOT/ KOT/2022	04.10.2022

ANNEXES

Annex 1 Normalized supporting structures
Annex 2 Special supporting structures

Annex 1

Standardized Supporting Structures

Cable clamps

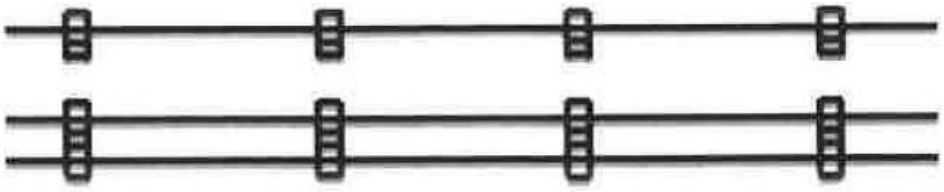
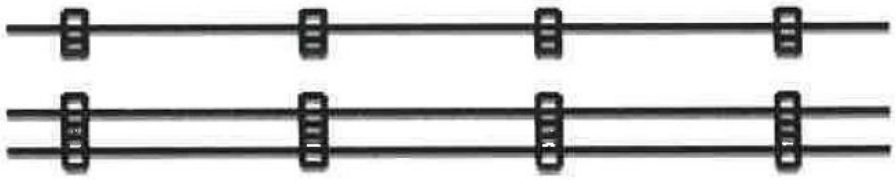


Figure 1 Supporting structure with cable clamps attached to the ceiling, horizontally to a wall[2] or steel profile. Design using FT, PFT and DFT

Characteristics of the supporting structure:

- spacing between suspension points - 300 mm
- maximum cable diameter - 50 mm
- maximum number of cables in one FT/PFT clamp - 3
- maximum number of cables in one DFT clamp - 6



[2] Using a support structure on the wall vertically and obliquely is also allowed

Figure 2 Supporting structure with cable clamps attached to the ceiling or horizontally to a wall[2] or steel profile and steel sheet. Design with F and DF clamps

Characteristics of the supporting structure:

- spacing between suspension points - 300 mm
- maximum cable diameter - 50 mm
- maximum number of cables in one F clamp - 3
- maximum number of cables in one DF clamp - 6



Figure 3 Supporting structure with cable clamps attached to the ceiling, horizontally to a wall[3] or steel profile. Design with L brackets

Characteristics of the supporting structure:

- maximum structure load - 7.5 kg/m
- spacing between suspension points - 300 mm
- maximum number of cables in one clamp - 4



Figure 4 Supporting structure with cable clamps attached to the ceiling, wall horizontally. Design with CH clamps

Characteristics of the supporting structure:

- maximum structure load - 6 kg/m
- distance between suspension points - 300 mm
- maximum number of cables in the clamp - a bundle of cables

CLASSIFICATION OF CABLE ASSEMBLIES ON STANDARDIZED CABLE SUPPORTING STRUCTURES

Annex 1 Table 1.

[3] Use of a supporting structure on the wall vertically and obliquely, while ensuring adequate cables are held by the clamp is also allowed

Cable manufacturer	Cable type	Cable brackets Figure 1	Cable brackets Figure 2	Cable clamps Figure 3	Cable clamps Figure 4
TECHNOKABEL	NHXH	E90	E90	E60	
	NHXCH				
	(N)HXH	E90	E90	E90	
	HTKSH PH90	E90	E90	E90	E90
	HTKSHeq PH90	E90	E90	E90	
	HDGs	E90	E90		
	HDGseq	E90	E30		
	HDGs (żo)	E90		E90	
	HDGs - W		E90		
	HLGseq	E90			
BITNER	(N)HXH				
	HTKSH	E90	E90		
	HTKSHeq		E90		
	HDGs		E90		
	HDGseqf				
	BITflame 1000	E90		E90	
PRAKAB	PRAFlaDur®90 (N)HXH FE180/P90-R…	E30			
	PRAFlaGuard® F SSKFH-V180 P90-R…	E30			
VUKI	JE-H (St)H PS90	E90			

On the basis of DIN 4102-12:1998 it is possible to transfer the results of function tests on cables or wires to standardized supporting constructions. DIN 4102-12:1998 to standardized cable supporting constructions of other manufacturers. cable supporting structures of other manufacturers. Classifications of cable assemblies according to DIN 4102-12:1998 depending on the used standardized cable supporting structure and cable used are described in Technical Approvals and National Technical Assessments issued by the CNBOP-PIB.

Annex 2
Special Supporting Structures
Cable Clamps

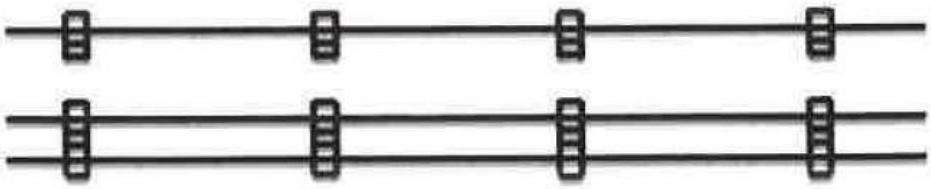


Figure 5 Special supporting structure with cable clamps attached to the ceiling, horizontally to a wall[4] or steel profile. Design using FT, PFT and DFT

Characteristics of the supporting structure:

spacing between suspension points - 600 mm

- maximum cable diameter - 50 mm
- maximum number of cables in one FT /PFT clamp - 3
- maximum number of cables in one DFT clamp - 6

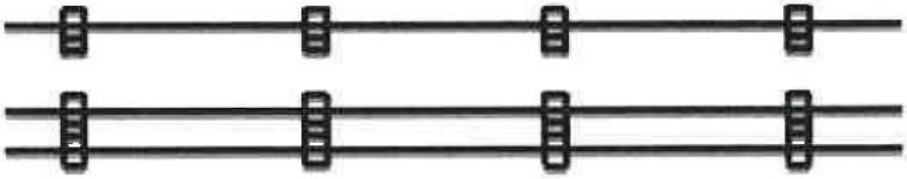


Figure 6 Special supporting structure with cable clamps attached to the ceiling or horizontally to a wall[4] or to steel profile and steel sheet. Design with F and DF clamps

Characteristics of the supporting structure:

- spacing between suspension points - 600 mm
- maximum cable diameter - 50 mm
- maximum number of cables in one F clamp - 3
- maximum number of cables in one DF clamp - 6



[4] Use of a support structure on the wall vertically and obliquely is also allowed

Figure 7a Special supporting structure with cable clamps attached to the ceiling, horizontally to a wall[5]. Design with LI brackets

Characteristics of the supporting structure:

- spacing between suspension points - 300 mm
- maximum number of cables in one clamp - 20



Figure 7b Special supporting structure with cable clamps attached to the ceiling, horizontally to a wall[5]. Design with LI clamps.

Characteristics of the supporting structure:

- distance between suspension points - 600 mm
- maximum number of cables in the clamp - 20



Figure 8a Special supporting structure with cable clamps attached to the ceiling, horizontally to a wall[5] or steel profile and steel sheet. Design with L brackets

Characteristics of the supporting structure:

- maximum structure load - 7.5 kg/m
- spacing between suspension points - 300 mm
- maximum number of cables in one clamp - 20



Figure 8b Special supporting structure with cable clamps attached to the ceiling, horizontally to a wall[5] or steel profile and steel sheet. Design with L brackets

Characteristics of the supporting structure:

- maximum structure load - 7.5 kg/m
- spacing between suspension points - 600 mm

[5] Use of a supporting structure on the wall vertically and obliquely, while ensuring adequate holding of cables by the clamp is also allowed

- maximum number of cables in one clamp - 20



Figure 9 Special substructure with cable clamps for mounting to the ceiling or horizontally to a wall[5]. Design with double LD clamps

Characteristics of the supporting structure:

- maximum structure load - 2.5 kg/m
- spacing between suspension points - 600 mm
- maximum number of cables in one clamp - 8 (2 x 4)



Figure 10 Special support structure with cable clamps for mounting to the ceiling, horizontally to a wall, or steel sheet. Design with CH clamps

Characteristics of the supporting structure:

- maximum structure load - 6 kg/m
- spacing between suspension points - 600 mm
- maximum number of cables in one clamp - a bundle of cables



Figure 11a Special support structure with cable clamps fixed to the ceiling, horizontally to a wall or steel sheet. Design with CHS clamps

Characteristics of the supporting structure:

- maximum structure load for CHS - 5 kg/m
- spacing between suspension points - 300 mm
- maximum number of cables in one clamp - a bundle of cables



Figure 11b Special support structure with cable clamps fixed to the ceiling, horizontally to a wall or steel sheet. Design with CHS clamps

Characteristics of the supporting structure:

- maximum structure load for CHS - 5 kg/m
- spacing between suspension points - 600 mm
- maximum number of cables in one clamp - a bundle of cables



Figure 12a Special support structure with cable clamps attached to the ceiling, horizontally to a wall or to a steel profile. Design with CC clips

- spacing between suspension points - 300 mm
- maximum number of cables in one clip - 3



Figure 12b Special support structure with cable clamps attached to the ceiling, horizontally to a wall or to a steel profile. Design with CC clips

- spacing between suspension points - 600 mm
- maximum number of cables in one clip - 3



Figure 13a Special support structure with steel strap attached to the ceiling horizontally. Design with CA tie

Characteristics of the supporting structure:

- maximum structure load - 2 kg/m
- spacing between suspension points - 300 mm
- maximum number of cables in one clamp - 4



Figure 13b Special support structure with steel strap attached to the ceiling horizontally. Design with CA tie

Characteristics of the supporting structure:

- maximum structure load - 2 kg/m
- spacing between suspension points - 600 mm
- maximum number of cables in one clamp - 4

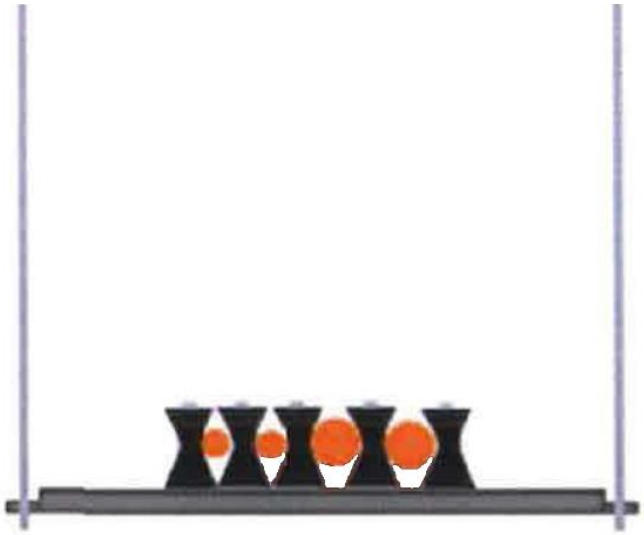


Figure 14 Special supporting structure made of 400PTTR profiles and two CELO DIN 975 M8 threaded rods to be attached to the ceiling. Design with Multitub MT clamps

Characteristics of the supporting structure:

- maximum structure load - 10 kg/m
- spacing between suspension points - 700 mm



Figure 15 Special support structure made of 400PTTR profiles attached to the wall horizontally. Design with Multitub MT clamps

Characteristics of the supporting structure:

- maximum structure load - 10 kg/m
- spacing between suspension points - 700 mm

CLASSIFICATION OF CABLE GROUPS ON SPECIAL CABLE SUPPORTING STRUCTURES

Attachment 2 Table 1

Cable Manufacturer	Cable type	Cable brackets Figure 5	Cable brackets Figure 6	Cable clamps Figure 7a	Cable clamps Figure 7b	Cable clamps Figure 8a	Cable clamps Figure 8b	Cable clamps Figure 9	Cable clamps Figure 10	Cable clamps Figure 11a	Cable clamps Figure 11b	Cable brackets Figure 12b	Cable brackets Figure 12a	Steel tie Figure 13a	Steel tie Figure 13b	Multitub clamps Figure 14	Multitub clamp Figure 15
TECHNOKABEL	NHXH		E90		E90					E30	E60						
	NHXCH								E90								
	(N)HXH	E90			E90				E90								
	HTKSH PH90	E90	E90 mounting only vertically on walls				E90		E90	E90	E90		E60				
	HTKSHeq PH90	E30	E90				E90		E90	E90	E60						
	HDGs	E90	E90				E90		E90	E90	E90		E60				
	HDGseq																
	HDGs (żo)																
	HDGs-W	E90	E90 mounting only vertically on walls						E90	E90	E90						
	HLGS	E90															
BITNER	(N)HXH		E90				E90										
	HTKSH	E90	E90		E90		E90	E90	E90		E90		E90	E90			
	HTKSHeq	E90	E90	E90			E90	E90	E60		E90	E90					
	HDGs	E90	E90		E90		E90	E90	E90		E90	E90			E90		
	HDGseqf	E90	E90	E90		E90	E90	E60	E90		E90						
	BiTflame 1000	E90	E90				E90	E90	E90		E90					E90	E90
	HLGS	E90															
ELKOND	1-CXKH-V-J RE P90-R	E90															
PRAKAB	PRAFaDur® 90 (N)HXH FE180/P90-R	E30															
	PRAFlaGuard ® F SSKFH-V180 P90-R…	E90								E90	E90						
VUKI	JE-H(St)H PS90	E90								E90	E90						

Classification of cable groups according to the DIN 4102-12:1998 standard on special supporting structures apply only for a tested structure with a specific tested cable type and apply also to supporting structures with smaller distance between supports/brackets.

THE END OF NATIONAL TECHNICAL ASSESSMENT

The National Technical Assessment 1st edition was prepared by	**Junior Foreman Grzegorz Mroczko, M.Sc** Title or equivalent designation, first and last name	15.11.2022 /illegible signature/ Date, signature
The National Technical Assessment 1st edition was authorized by	**Konrad Zaciera, MSc** Title or equivalent designation, first and last name	15.11.2022 /illegible signature/ Date, signature

ADDITIONAL INFORMATION

Regulations

1. Act of April 16, 2004 on construction products (Journal of Laws of 2021, item 1213).
2. Regulation of the Minister of Infrastructure and Construction of November 17, 2016 on national technical assessments (Journal of Laws 2016, item 1968).
3. Regulation of the Minister of Infrastructure and Construction of November 17, 2016 on the method of declaring the performance of construction products and the method of marking them with the construction mark (Journal of Laws of 2016, item 1966, as amended).
4. Regulation of the Minister of Infrastructure of April 12, 2002 on the technical conditions to be met by buildings and their location (consolidated text of the Journal of Laws of 2022, item 1225, as amended).