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**CNBOP-PIB NATIONAL
TECHNICAL ASSESSMENT
CNBOP-PIB-KOT-2018/2022/0037-3703
edition 2**

This CNBOP-PIB National Technical Assessment represents the replacement of
the CNBOP-PIB National Technical Assessment no. CNBOP-PIB-KOT-2018/2022/0037-3703 edition 1

Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej im. Józefa Tuliszkowskiego – Państwowy Instytut Badawczy,
/Józef Tuliszkowski Scientific and Research Centre for Fire Protection - National Research Institute – translator's note/
acting on the basis of Article 9 point 2 of the Act on Construction Products and the Regulation of the Minister of
Infrastructure and Construction on National Technical Assessments, as a result of the procedure for issuing a
National Technical Assessment, at the request of the company:

**CELO Polska Sp. z o. o.
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91-342 Łódź**

STATES A POSITIVE ASSESSMENT OF PERFORMANCE OF THE CONSTRUCTION PRODUCT:

CELO cable assemblies
Cable supporting structures with electric cables and wires of E30, E60, E90
electrical function maintenance class
according to the DIN 4102-12:1998

INTENDED USE OF THE CONSTRUCTION PRODUCT
- for applications subject to fire resistance requirements

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1.

Technical data sheet of the construction product

CELO cable assemblies
(cable supporting structures including electric conductors and cables)
with electric function support class E30, E60, E90 according to the DIN 4102-12:1998
standard

1. Technical data sheet of the product

1.1. General technical characteristics of the product

The subject of the present CNBOP-PIB National Technical Assessment are CELO cable assemblies (cable supporting structures together with electric wires and cables) with the electrical function maintenance class E30, E60, E90 according to the DIN 4102-12:1998 standard - sets of products consisting of CELO cable supporting structures indicated in table 1 and cables of producers indicated in the table 2.

CELO cable assemblies ensure the continuity of the supply of electricity or signal transmission under fire conditions for the time required for the start-up and operation of fire protection equipment¹ and are classified in the electrical function maintenance class E30, E60 or E90 according to DIN 4102-12:1998, depending on the type and model of cable supporting structure used and the type and model of cable used.

Sustaining the function of a cable assembly is to be understood as its ability to maintain the continuous transmission of electrical energy and IT signals (e.g. in emergency power supply paths) at the fire temperature determined by the standard curve (ETK) for a period of 30, 60 or 90 minutes and under static rated load.

CELO cable assemblies are available as:

- normative assemblies whose design complies with para. 7.3.3.3 of the DIN 4102-12:1998 standard,
- special (oversized) assemblies that have different parameters than those specified in para.

7.3.3.3 of the DIN 4102-12:1998 standard with regard to the method of attachment, thickness of materials, type of substrate, type of material and type of coating, e.g. structures with greater spacing between suspension points, etc.

Evaluation of CELO cable assemblies in terms of sustaining electrical functions (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 set out 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 the DIN 4102-12:1998 Fire behaviour of building materials and components - Part 12: Maintaining the function of electrical cable assemblies - Requirements and tests. The test procedure for normative and special cable assemblies is in accordance with the DIN 4102-12:1998 standard.

The scope of use of CELO cable assemblies is limited to cables with a voltage rating of up to 1 kV.

CELO cable assemblies may include, **subject to para. 2.2 of this national technical assessment**, the CELO cable supporting structure components listed in Table 1 and the cable types from the designated manufacturers listed in Table 2.

¹ In accordance with the Regulation of the Minister of Infrastructure on the technical conditions to be met by buildings and their location of 12 April 2002 (consolidated text: Journal of Laws 2022, item 1225, as amended by Journal of Laws 2023, item 2442, Journal of Laws 2024, item 726).

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

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

Table 1 (1/2). CELO cable supporting structure components

No.	Name of the product	Designation
1	Cable clips (and Peszl tube cables)	F, DF FT, DFT, PFT
2	Cable clips	CC, WSC-M, WDC-M
3	Adapter for CC clamps	ACC
4	Clamps for fixing cables (and Peszl tube cables)	L, LI, LD
5	Cable clamps for securing cables in bundles	CH, CHS
6	Cable clamps with PTTR profile	Multitub MT
7	Steel clamping strip	CA
8	Fasteners for fixing threaded parts	ATR/TR ATV/TV
9	Suspension coupling with mounting eye	AAT
10	Pads	AW
11	Dynamically set nails for concrete, cracked concrete, solid bricks, hollow-core concrete, SILKA bricks, hollow bricks	XHA
12	Screws for steel profiles and sheet steel	DIN 7504K- AGRP 7504N TORAB ST PG
13	Screw for the installation of elements with MSD sleeves into concrete, cracked concrete, solid brick, hollow-core concrete, SILKA bricks, hollow-core bricks, SILKA bricks, hollow bricks	TIRAFONDO - TF
14	Screw for mounting clamps using, among other things, MSD sleeves for concrete, cracked concrete, solid bricks, hollow-core concrete, SILKA bricks, hollow bricks	TORNIGRAP - TG
15	Concrete bolts of class $\geq$ C15/20 and pretensioned concrete, stone, solid and hollow bricks, sand-lime block.	BTS BTS 4 / BTS 5 / BTS 6
16	Anchor bolts	BAP DA BAZII DNBOLT (DT, DV, DG, DA)
17	Frame anchor bolts for concrete, cracked concrete, solid bricks, hollow-core concrete, SILKA bricks, hollow-core bricks Ytong blocks	MFR
18	Sleeve for concrete class $\geq$ C15/20 and pretensioned concrete	SAP/SAPK
19	Sleeve for concrete class $\geq$ C15/20, stone, solid bricks, sand-lime bricks, concrete blocks, aerated concrete, components with cavities using screws TF, TG	MSD
20	Multi-material chemical mortar	VVSF
21	AST threaded rod for fastening with VY RESIFIX chemical mortar	RESI AST
22	Fixings for plasterboard and cavity wall	BT/ BTLO
23	Fixings for plasterboard and cavity wall	HRM
24	G-K Panel mounting pin	GKDZ / GKDZPZ
25	Threaded coupling for connecting threaded components. Substrate depending on the CELO fastening element	MH, MS
26	Metal clips for steel beams for M6, M8, M10, M12 threads max load 10 kg/m	CMV, PMV
27	Metal clips for steel beams for M6/M8 threads. Steel beam thicknesses: 1,5-20,0mm max load 10 kg/m	CVA
28	Metal clips for steel beams for M6x19 threads. Steel beam thicknesses: 3,0-20,0mm	CAB
29	Metal clips for steel beams with a 9x3mm wide hole for cable ties. Steel beam thicknesses: 1,5-20,0mm	CBR
30	Metal clips for steel beams with a 6,3mm mounting hole for cable ties or steel cables. Steel beam thicknesses: 1,5-20,0mm	CAL
31	Double threaded connector	ECT, ESP
32	M4-M12 threaded rod of 4.8 class	DIN975
33	Steel nut of class 8 steel	DIN934

Table 1 (2/2). Components of CELO cable supporting constructions

Item	Product name	Symbol
34	Steel washer with a thickness of 1.6-2.0 mm	AAN
35	PTTR profile for MT clamps depending on a CELO mounting 10kg/m	PTTR
36	CELO profile max load 10 kg/m	4020P 420PSTD, 3840P 3840PSTD
37	CELO profile max load 5kg/m	E2000PG
38	Self-tapping screw FT 7x20	FTBT
39	Wire rope set with locking clamp 1,5mm-3mm max load 10 kg/m	WFS
40	Metal clamp for mounting sheet metal with 6,3mm eyelet or M6 M8 M10 rods max load 10 kg/m	TPR, TPW
41	Cable ties for securing and bundling cables on structures	CCT
42	Trapezoidal hanger for steel sheets max load 10 kg/m.	TPZ

Table 2. Manufacturers and cable types

Lp.	Manufacturer	Cable types
1.	Zakłady Kablowe BITNER Sp. z o.o. ul. Friedleina 3/3 30-009 Kraków Poland	NHXH FE180 PH120/E90 MIKA NHXCH FE180/PH120/E90 MIKA HTKSH FE180 PH90/E90, HTKSHekw FE180 PH90/E90 HDGs FE180 PH120/E90, HDGsekwf FE180 PH120/E90 HLGs FE180/PH120/E90 BiTflame® 1000 FE180/PH120/E90 BiTflame® 1000C FE180/PH120/E90 BiTflame® AS FE180/PH120/E90 BiTflame® AS(St) FE180/PH120/E90
2.	TECHNOKABEL S.A. ul. Nasielska 55 04-343 Warszawa Poland	NHXH FE180 PH90/E90, NHXCH FE180 PH90/E90 (N)HXH FE180 PH90/E90 NHXCH-J-SERVO FE180 PH90/E90 HTKSH FE180 PH90/E30-E90; HTKSHekw FE180 PH90/E30-E90 HDGs FE180 PH120/E30-E90, HDGsekw FE180 PH120/E30-E90 HDGs-W FE180 PH120/E30-E90 HLGs FE 180 PH120/E30-E90, HLGsekw FE 180 PH120/E30-E90
3.	ELKOND HHK a.s. Oravicka 1228 028 01 Trstena Slovakia	1-CXKH-V-J RE P90-R
4.	PRAKAB PRAŽSKÁ KABELOVNA KE Kabla 278 CZ-10209 Praga Czech Republic	1-CXKH-V-J RE P90-R PRAFlaDur® 90 (N)HXH FE180/P90-R... PRAFlaGuard® F SSKFH-V180 P90-R...
5.	VUKI a.s. Rybničná 9985/38, 831 07 Bratislava Slovakia	JE-H(St)H PS90 CHKE-V B2ca PS90

1.2. Manufacturer and production facilities

CELO Cable supporting structures are produced by:

CELO Fijaciones SL

C/Rossello 7

08211 Castellar del Valles

Spain

In the following production facilities:

- **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

Wires and cables are manufactured in the following production facilities:

- **TECHNOKABEL S.A.**, ul. Wiatraczna 28, 06-550 Sześćńsk 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 PRAŽSKÁ KABELOVNA, a.s.** KE Kabla 278, CZ-10209 Praga, Czech Republic
- **VUKI a.s.**, Rybnická 9985/38, 831 07 Bratislava, Slovakia

1.3. Division

CELO cable supporting structures are made of materials, depending on the method of protection against the corrosive atmosphere. Products are available in the following material versions:

- galvanised steel in accordance with the PN-EN ISO 2081:2011 and the PN-EN 10327:2005 standard,
- hot-dip galvanised in accordance with the PN-EN ISO 1461:2011 standard,
- acid resistant steel,
- flake zinc-plated steel the PN-EN ISO 10683:2014-09 standard.

Selected types and designations of cables included in CELO cable assemblies are shown in Table 3.

Table 3. Selected types and designations of cables included in CELO cable assemblies

Designation	Cable name
HTKSH	Unshielded station (S) telecommunication (T) cable (K) with single-conductor copper wires and insulation of halogen-free, low-smoke-generating material(H) and sheathing of halogen-free, flame-retardant, low-smoke-generating material
HTKSHekw	Shielded (ekw) station (S) telecommunication (T) cable (K) with single-conductor copper wires and insulation of halogen-free, low-smoke-generating material (H) and sheathing of halogen-free, flame-retardant, low-smoke-generating (H) material
HDGs	Single-conductor (D) copper cable with insulation of special silicone rubber (Gs) and sheathing of halogen-free, flame-retardant, low-smoke-generating material (H)
HLGs	Cable with multi-stranded (L) copper conductors with insulation of special silicone rubber (Gs) and sheathing of halogen-free, flame-retardant, low-smoke-generating material (H) Kabel o żyłach miedzianych wielodrutowych (L), o izolacji ze specjalnej gumy silikonowej (Gs) i powłoce z tworzywa bezhalogenowego, nierozprzestrzeniającego płomienia, o małym wydzielaniu dymu (H)
HDGsekw	Single-conductor (D) copper cable with insulation of special silicone rubber (Gs) and sheathing of halogen-free, flame-retardant, low-smoke-generating material (H) and with a common screen at the core (ekw)
HLGsekw	Cable with multi-stranded (L) copper conductors with insulation of special silicone rubber (Gs) and sheathing of halogen-free, flame-retardant, low-smoke-generating material (H) and with a common screen at the core (ekw)
JE-H(St)H	Telecommunications installation cable (JE) with insulation and sheathing of halogen-free, flame-retardant, low-smoke-generating material (H) and with a common screen at the core (St)
NHXH	Electricity cable (N) with copper conductors and double insulation made of mica tape and cross-linked halogen-free, flame-retardant, low-smoke-generating material (HX), of filling sheathing and sheathing made of halogen-free, flame retardant, low-smoke-generating material (H)
NHXCH	Electricity cable (N) with copper conductors and double insulation made of mica tape and cross-linked halogen-free, flame-retardant, low-smoke-generating material (HX), of filling sheathing and sheathing made of halogen-free, flame-retardant, low-smoke-generating material (H) with a coaxial conductor in the form of a spiral winding on the filling sheathing (C)
(N)HXH	Electricity cable (N) with copper conductors and insulation made of cross-linked silicon, flame-retardant, low-smoke-generating (HX) rubber. Filling sheathing and outer sheathing made of halogen-free, flame-retardant, low-smoke-generating material (H)
(N)HXCH	Electricity cable (N) with copper conductors and insulation made of cross-linked silicon, flame-retardant, low-smoke-generating (HX) rubber. Filling sheathing and outer sheathing made of halogen-free, flame-retardant, low-smoke-generating (H) material. The cable with an additional, coaxial conductor in the form of a spiral winding on the filling sheathing (C)
PH 90 PH 120	Ability of the cable to maintain continuity of the circuit (actual conduction of electric current or transmission of signals) in accordance with the PN-B-02851-1 standard expressed in minutes (testing in accordance with the PN-EN 50200)
E 30 E 60 E 90	Cable capacity with a specific cable supporting structure (cable assembly) to maintain the electric function expressed in minutes (testing in accordance with the DIN 4102-12 standard)
FE 180	Zdolność kabla do zachowania ciągłości obwodu (rzeczywistego przewodzenia prądu lub przenoszenia sygnału) wyrażana w minutach (badanie zgodnie z PN-IEC 60331-21 w warunkach statycznych przy temperaturze 750° C)

1.4. Marking

CELO cable supporting structures are identified on the basis of the CELO company product catalogue. It is not possible to apply marking on all elements due to dimensions and production technology, selected products are mechanically marked only with the company logo and/or a label identifying the product.

Product marking appears on the product or packaging and gives the following information:

- name and address of the manufacturer,
- product code,
- product name,
- number of pieces per pack (for bulk packaging),

Cable marking, includes the following information:

- cable symbol with specification of typical size,
- brandmark,
- year of production.

End of the chapter

2.

Intended use of the construction product

**CELO cable assemblies
(cable supporting structures including electric conductors and cables) with electric
function support class E30, E60, E90 according to the DIN 4102-12:1998 standard**

2.1. Intended use

CELO cable supporting structures together with electrical, teletechnical cables of the manufacturers indicated, listed in table no. 2 of this CNBOP-PIB National Technical Assessment, can be used as cable assemblies in power supply and control systems for fire protection devices in buildings.

The cable assemblies described in this CNBOP-PIB National Technical Assessment are qualified to the electrical function maintenance class E30, E60, E90 according to the DIN 4102-12 standard, and according to § 187.3. of the Regulation of the Minister of Infrastructure of 12 April 2002 on technical conditions to be met by buildings and their location (consolidated text: Journal of Laws 2022 item 1225, as amended by Journal of Laws 2023 item 2442, Journal of Laws 2024 item 726), as ensuring continuity of electricity supply or signal transmission for the time required for start-up and operation of the device, defined as 30, 60 and 90 minutes respectively.

The assessment of the cable assemblies in terms of continuity of the electricity supply or signal transmission, taking into account the type of substrate and the intended method of attachment to it, was carried out in accordance with the conditions set out in the Polish standards 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 the DIN 4102-12:1998 standard. Fire specifications of building materials and components - Part 12: Sustaining the function of electrical cable assemblies - Requirements and tests.

2.2. Scope and conditions of application

Wires, cables, fixings and conduit boxes may be used in cable assemblies provided that:

- a) they fulfil the requirements of this National Technical Assessment of the CNBOP-PIB, which should be confirmed by positive test results of the cable assembly (cable together with its attachment) in accordance with annex 1, 2 or 3 of this National Technical Assessment of the CNBOP-PIB) according to the PN-EN 1363-1:2012/PN-EN 1363-1:2020-07 and DIN 4102-12:1998 standards, and
- b) where manufacturers or suppliers of conductors and cables have assessed and verified the constancy of product's performance, which has led to the issuing of a National Certificate of Constancy of Performance (NCoCP) in accordance with the national technical assessment for the product, and
- c) if the manufacturers or suppliers of the installation boxes have assessed and verified constancy of performance of the product, which has resulted in the issuing of a national certificate of constancy of performance for the installation box in accordance with the national technical assessment.

Anchors/pins/screws/nails with confirmed fire resistance in the respective material may be used in cable assemblies. The confirmation has to be documented by an appropriate document depending on the assessment system (for the System 1 of the assessment - the certificate of constancy of performance or the national certificate of constancy of performance, for the System 2+ - the certificate of conformity of factory production control with the European Technical Assessment or the national certificate of conformity of factory

production control with the national technical assessment).

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

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

2.3. Conditions of use, installation and maintenance

CELO cable assemblies should be mounted to concrete substrate of class $\geq$ C20 or natural stone, masonry substrate (e.g. solid ceramic brick, lime-sand brick, concrete blocks and cellular concrete), to steel structures or to steel sheet. It is permissible to install the cable assemblies on other substrates with an adequate strength attested by a load bearing capacity equal to at least the resistance of the cable assembly.

The basic parameters for fixing cable clamps and brackets are shown in Table 4.

2.3.1. Limiting conditions:

1. Brackets or outriggers should be fixed to a solid ceiling or wall using substrate-matched certified plugs in accordance with the manufacturer's recommendations.
2. M8, M10, M12 sleeves and dowels should be recessed into a minimum of 60 mm of the concrete, and those designated as M6, a minimum of 30 mm, unless otherwise specified by the relevant fire resistance document indicated in para. 2.2. The tension force per dowel should not exceed 500 N. Alternatively, dowels, the suitability of which has been documented in terms of fire safety, may be used. The installation instructions of the manufacturer of the approved dowels must always be followed.
3. It should be guaranteed that the CELO cable assemblies will not be affected in their class to remain functional by falling building elements.
4. CELO cable assemblies can be made as suspended structures - fixed to ceilings and flat roofs, wall-mounted fixed to walls horizontally or vertically and diagonally. Fastening to steel structures and sheet metal is also permitted.

2.3.2. It is permissible in the CELO cable assemblies to:

1. fix them to another substrate of at least the same fire resistance class (fire resistance R30, R60, R90) as the cable assembly, using certified anchoring elements suitable for that substrate and load,
2. use anchoring elements (nails, screws, sleeves, etc...) of other manufacturers with documented resistance and load-bearing capacity in the respective substrate,
3. The test results of cables fixed with double clamps can be transferred to fixings with two single clamps fixed with one connector,

4. DFT, PFT, F, DF brackets can be flush-mounted (minimum groove depth 15 mm),
5. CELO cable supporting structures may be coated with paint up to a layer thickness of 1.5 mm.
6. CELO fastening elements have also been tested in cable constructions (trays, ladders) of other manufacturers and obtained classifications on the basis of the DIN 4102-12:1998 standard. Details are described in the National Technical Assessments for cable assemblies issued by CNBOP-PIB, National technical Assessment for cable assemblies,
7. Fixing with F, DF, DFT, PFT, L, LI, LD clamps of horizontal cables in tubes and halogen-free plastic strips,
8. Use of CCT cable ties to segregate or separate cables/conductors on cable structures.

2.3.3. It is forbidden in the CELO cable assemblies to

1. use a common support structure for the route constituting the E30, E60, E90 cable assembly and the route without a fire function.
2. configure routes using elements from Table 1 but not included in Annexes A and B.

The permissible loads and technical parameters of CELO cable supporting structures should be in accordance with the manufacturer's catalogue and Table 4.

Table 4.

BASIC CABLE FIXING PARAMETERS IN BRACKETS/CLAMPS ON THE CEILING, ON HORIZONTAL WALLS OR STEEL PROFILES		
PARAMETER'S NAME	PARAMETER'S VALUE	
CABLE BRACKETS AND CLAMPS		
Kinds of brackets and clamps	PFT, DFT, F, DF, CC, WSC-M, WDC-M	L, LD, LI, CH, CHS, CCM,
Cable diameters possible to be fixed in holders and clamps	the maximum diameter of the cables shall be in accordance with the maximum dimension of the holder, not more than 50 mm	Single cable: from 4 mm to 60mm and L bundle: to 7,5 kg/m LD bundle: to 2,5 kg/m LI bundle: to 2,5 kg/m CH bundle: to 6 kg/m CHS bundle: to 5 kg/m CCM bundle: to 2,5kg/m
Max. distance between brackets and clamps	300 mm, 600 mm	300 mm, 600 mm
Mounting	Fasteners, accessories and approved substrate types according to table 1	Fasteners, accessories and approved substrates according to table 1

3.

Performance of the construction product

**CELO cable assemblies
(cable supporting structures including electric conductors and cables) with electric
function support class E30, E60, E90 according to the DIN 4102-12:1998 standard**

3. Performance of the construction product and methods used to assess it

3.1 Maintaining the electrical function of the cable assembly

Table 5. Performance of CELO cable assemblies

Item	Performance	Requierments	Testing according to
1	2	3	4
1.	Maintaining the electrical function of the cable assembly (ensuring continuity of electric power supply or signal transmission for the time required for the start-up and operation of the fire-fighting equipment)	E30, E60, E90 class according to DIN 4102-12:1998 30, 60 and 90 min. according to the Polish Law	DIN 4102-12:1998 and PN-EN 1363-1:2012/ PN-EN 1363-1:2020-07

End of the chapter

4.

Packaging, transport and marking of the construction product

CELO cable assemblies

**(cable supporting structures including electric conductors and cables) with electric
function support class E30, E60, E90 according to the DIN 4102-12:1998 standard**

4. Packaging, transport, storage and marking of the construction product

4.1. Packaging

The products should be packaged by the manufacturer of the construction product.

CELO cable supporting structures

CELO cable supporting structure components should be placed in unit or bulk packaging that protects them from mechanical damage and the environment, and then transported, limiting the possibility of free movement and protecting them from damage during handling and transportation

Cables

Fabricated sections of cables should be tightly terminated.

Packaging of cables should be in accordance with the requirements of the PN-E-79100 standard.

4.2. Transport

CELO cable supporting structures

The construction product may be transported by any means of transport. During transport, the building product shall be protected against damage in accordance with the means of transport, the weight and dimensions of the packaging.

Cables

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

4.3. Storage

The construction product should be stored in the manufacturer's packaging. The method of storage should ensure that the declared essential characteristics are not affected.

CELO cable supporting structures

The components of CELO cable supporting structure must be stored in accordance with the following conditions:

- Products in delivery condition (i.e. in original CELO packaging) should be stored in dry and ventilated premises,
- During storage, protect against rapid changes in humidity and temperature which may cause condensation. Failure to do so may result in white spots (zinc oxides),
- If it is necessary to locate the products in the open air for a short period of time, ensure that moisture is drained away. Use a cover to ensure breathability,
- If the products get wet, they must be dried unconditionally (separate each piece so that it does not come into contact with another and lay in a dry airy place until dry) before storage.

Cables

Storage of cables shall be in accordance with the requirements of the PN-E-79100 standard.

4.4. Method of marking

Product marking should be carried out in accordance with the Regulation of the Minister of Infrastructure and Construction on the manner of declaring the performance characteristics of construction products and the manner of marking them with the construction product mark.

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

The marking of the construction product with the construction mark shall be accompanied by the following information:

- a) the last two digits of the year in which the construction mark was first affixed to the construction product,
- b) the name and registered office address of the manufacturer or an identification mark enabling,
- c) the name and registered office address of the manufacturer to be unequivocally identified,
- d) the name and designation of the construction product type,
- e) number and year of the National Technical Assessment according to which the performance was declared,
- f) the number of the national declaration of performance,
- g) the level or class of performance declared,
- h) the name of the certification body, where such a body has been involved in the assessment and verification of constancy of performance of the construction product,
- i) the address of the manufacturer's website if the national declaration is made available there.

A construction product bearing the construction mark may bear other markings, signs and inscriptions, provided that they do not impair the visibility and legibility of the marking of the construction mark and the information referred to in § 11 of the aforementioned Regulation of the Minister for Infrastructure and Construction and that their meaning and graphic form are not misleading.

End of the chapter

5.

Assessment and verification of constancy of performance

**CELO cable assemblies
(cable supporting structures including electric conductors and cables) with electric
function support class E30, E60, E90 according to the DIN 4102-12:1998 standard**

5. Assessment and verification of constancy of performance (AVCP)

5.1. National system for assessment and verification of constancy of performance

In accordance with the Regulation of the Minister of Infrastructure and Construction on the method of declaring the performance of construction products and the method of marking them with the construction product mark: **CELO cable assemblies (cable supporting structures with electric wires and cables) with electric function support class E30, E60, E90 according to the DIN 4102-12:1998 standard**, covered by this National Technical Assessment are subject to the national system for assessment and verification of constancy of performance: 1+

In the 1+ national system:

1. the manufacturer's assessment and verification activities shall include determining the construction product type and carrying out:
 - a) factory production control;
 - b) testing of samples taken by the manufacturer at the production site in accordance with a testing plan agreed by him.
2. the assessment and verification by the certification body shall include:
 - a) carrying out an initial inspection of the production facility and factory production control,
 - b) the issuing of a national certificate of constancy of performance,
 - c) continuing surveillance, assessment and evaluation of factory production control,
 - d) carrying out control tests on samples taken by the certification body at the manufacturer's production site or storage facilities.

5.2. Type testing

The scope of the initial type test shall include the test specified under 3.1.

5.3. Check-ups

Table 6. Check-up plan

Item	Performance	Assessment method	Frequency of testing
1	External appearance, dimensions, marking ¹⁾	In accordance with the manufacturer's documentation	For each batch of products ^{1) 3)}
2	Maintaining the electrical function of the cable assembly	PN-EN 1363-1:2020-07 and DIN 4102-12:1998	Testing shall be carried out in case of modifications to the design covered by this National Technical Assessment
3	External appearance, dimensions, marking	In accordance with the manufacturer's documentation	Once every 5 years
4	External appearance, dimensions, labelling ²⁾	In accordance with the manufacturer's documentation	Once every 3 years ²⁾
¹⁾ Testing by the manufacturer ²⁾ Tests carried out on samples of the product taken by the certification body ³⁾ The batch size shall be specified in the factory production control documentation.			

The results of check-ups should be systematically recorded and the records of the register should confirm that the products meet the conformity assessment criteria. Each batch should be uniquely identifiable in the check-up record.

The manufacturer should specify in the factory production control documentation the size of the batch of manufactured product to be subjected to check-ups. Samples for check-ups should be taken at random, in accordance with the PN-N-03010 standard or an equivalent one. If there are different varieties (versions) of the product within one batch, then check-ups should be carried out for each variety.

Manufactured products shall be deemed to comply with the requirements of this National Technical Assessment if the results of the check-ups in section 5.3 are positive.

End of the chapter

6.

Factory production control

CELO cable assemblies

(cable supporting structures including electric conductors and cables) with electric function support class E30, E60, E90 according to the DIN 4102-12:1998 standard

6. Factory production control

Factory production control (hereinafter referred to as FPC) means documented, permanent and internal control of production in a factory. The objective of the FPC is to ensure reproducible production and that the products placed on the market or made available on the national market, as far as their performance and intended use are concerned, are in conformity with this National Technical Assessment.

The manufacturer of the construction product is responsible for the organisation of the FPC system.

6.1. General provisions

The manufacturer shall establish, implement, document and maintain a factory production control system. All the elements of factory production control adopted by the manufacturer shall be subject to systematic review, updating and improvement (if applicable).

6.1.1. Factory production control should include:

- a) policies, procedures, instructions, forms, (if applicable),
- b) tests, examinations, evaluations, verifications, checks (if applicable) and
- c) using the above to control raw materials and other incoming materials or sub-assemblies, equipment, the production process and the construction product.

6.1.2. The factory production control shall take into account the specific conditions of the manufacturing process of the construction product concerned.

6.1.3. The manufacturer shall commission a competent and authorised person to:

- a) identify procedures to demonstrate the conformity of the product at the appropriate stages,
- b) identify and record any case of non-compliance,
- c) identify procedures to correct cases of non-compliance.

6.1.4. In the case where subcontracting occurs, the manufacturer shall maintain total control of the product and ensure that it receives all information (e.g. protocol, report, dispatch, certificate) necessary to fulfil its obligations in accordance with these requirements.

6.1.5. If a construction product is partially designed, manufactured, assembled, packaged, processed and/or labelled by a subcontractor, the subcontractor's FPC may be taken into account for the product concerned, where applicable.

Note:

A manufacturer who subcontracts all of its activities cannot transfer responsibility for them to the subcontractor.

6.2. Supervision of documentation

The manufacturer should specify in the FPC documentation how the documentation will be supervised and for how long.

6.2.1. The manufacturer shall ensure that the documentation:

- a) is up-to-date;
- b) allows it to be identified, e.g. by means of numbers, dates of issue, titles,
- c) is in a suitable medium (e.g. paper or electronic)
- d) is subject to a periodic review to verify its currency, relevance and appropriateness.

6.2.2. Moreover, the manufacturer should ensure that the documentation will be:

- a) available in places where needed,
- b) adequately protected (e.g. integrity, confidentiality),
- c) stored in such a way as to ensure that it is not destroyed or rendered illegible;
- d) archived and destroyed (if applicable).

6.3. Management reviews

The manufacturer shall specify in the FPC documentation the manner in which management reviews are planned and carried out.

6.3.1. Management reviews should be carried out at regular intervals, but at least once a year.

6.3.2. Management reviews should include in their scope, as a minimum:

- a) matters relating to factory production control,
- b) product quality issues,
- c) complaints,
- d) the need to improve areas related to the production of the product.

6.3.3. The manufacturer should store

- a) all input data - including information on the operation of the FPC,
- b) any output data including capacities, needs and the review report.

6.4. Personnel

The manufacturer should specify in the FPC documentation how training and up-skilling of personnel will be planned and implemented.

6.4.1. The manufacturer should:

- a) identify the position(s) with responsibility for all FPC-related activities,
- b) (b) ensure that personnel carrying out work affecting the conformity of the product have, in relation to the work undertaken, the necessary knowledge, skills and experience to complete the work satisfactorily and safely,
- c) establish the appropriate level of competence, authority, responsibility and interdependence required among the personnel who manage, verify and perform the work affecting the conformity of the product with this National Technical Assessment,
- d) establish appropriate methods to ensure that staff competence is improved,
- e) maintain information on personnel competences, e.g. in the form of documented records of education, training, experience and/or skills.

6.5. Measuring equipment

6.5.1. The equipment used for weighing, measuring and testing shall be calibrated² or checked³ and regularly inspected in accordance with the documentation, which shall describe at least:

- a) frequency of calibration, checking and controls,
- b) calibration, verification and control criteria,
- c) rules on access to measuring equipment,
- d) the conditions of use of the measuring equipment.

6.5.2. For measuring equipment, the following shall be specified and available:

- a) calibration/verification status,
- b) calibration/verification records,
- c) the method of marking the equipment indicating at least the date of another/the next calibration/verification, and
- d) the identifying symbol from the list of testing and measurement equipment.

6.5.3. The manufacturer should specify (if applicable) how the required ambient conditions are to be monitored and measured.

6.6. Production equipment

6.6.1. Equipment used in the production process should be regularly inspected and maintained to ensure that use, wear or damage does not cause discrepancies in the production process.

6.6.2. The manufacturer should document the inspection and maintenance activities in accordance with the relevant documentation and the FPC, and records shall be kept for a predefined period of time.

6.7. Supervision of equipment

The manufacturer shall specify in the FPC documentation the rules for the use, storage and maintenance of measurement and production equipment.

6.7.1. The manufacturer should

- a) have at its disposal adequate means and equipment to perform all activities to ensure the appropriate level (i.e. a level not less than that identified in the test results used by the the Technical Assessment Unit) of the manufactured construction product, and the measuring equipment used shall ensure measurement consistency and the required accuracy;
- b) ensure that the means and equipment indicated in point a are maintained in readiness for their intended use; up-to-date instructions on the use, storage and maintenance of equipment should be easily available to personnel using the equipment,

¹ 'Calibration' (calibration) - an activity that, under specified conditions, in the first step establishes a relationship between the quantity values reproduced by a measurement standard together with their measurement uncertainties and the corresponding indications together with their uncertainties, and in the second step uses this information to establish a relationship to derive a measurement result from the indication. It is carried out by an external entity with appropriate competence.

² 'Checking' - an action which confirms that the test and measurement equipment, when in use, meets the requirements specified by the user to the extent applicable. It is carried out by the manufacturer's personnel inside the plant - the manufacturer is responsible for ensuring that the personnel are competent to carry out the activity in question.

- c) ensure (when necessary) that the equipment is calibrated before being put into service and thereafter, according to an established schedule, perform periodic calibrations/checks,
- d) ensure that the measurement equipment is adequately protected against adjustments that could invalidate the measurement results,
- e) protect measuring equipment from damage and deterioration during handling, storage and use; defective equipment should be withdrawn from service and should be stored so that it cannot be used,
- f) investigate the effect of any detected defect in the measuring equipment on the results of previously made measurements to determine their effect on the quality of previously manufactured construction products,
- g) ensure that records are made of the activities carried out on the measuring equipment (e.g. identification, calibration, checking and maintenance); these records should be kept for at least the period of validity of the National Technical Assessment,

6.7.2. The equipment calibration schedule should be arranged and implemented in such a way as to ensure, where applicable, that the manufacturer's measurements are linked to national, international standards of units of measurement or national metrological units where these are available.

6.7.3. Reference standards, which are in the possession of the manufacturer and used for checking, should be used only for checking. They should be calibrated by a competent body that can provide a link to a national or international standard unit of measurement.

6.7.4. If a correlation with national or international standards is not possible, the manufacturer shall provide satisfactory proof of the correlation or accuracy of the measurement results.

6.7.5. The calibration certificate for control and measurement equipment shall include the necessary uncertainty values and the coverage factor k .

6.7.6. Where appropriate, in-service equipment should be subjected to checks between the dates of subsequent calibrations.

6.7.7. Where justified, stored equipment should be assessed at appropriate intervals to detect deterioration.

6.7.8. If the manufacturer uses electronically controlled instrumentation in connection with his production, he shall ensure:

- a) the capability/suitability of the computer software used to measure the specified requirements for its intended use. This should be done prior to use,
- b) testing computer software to confirm its suitability,
- c) establishing and implementing procedures to protect data integrity,
- d) maintenance of computers and automated equipment in such a way as to ensure their proper functioning,
- e) establishing and implementing data security procedures.

6.8. Materials and components

The manufacturer shall specify in the FPC documentation the method of control ensuring that all materials and components received comply with the technical specifications specified by the manufacturer.

- 6.8.1.** The manufacturer shall ensure that the inspection and its programme are documented. When used in a set of supplied sub-assemblies, the level of conformity assessment of that sub-assembly shall be as indicated in the relevant technical specification for that sub-assembly.

6.9. Design process

The manufacturer shall specify in the documentation of the FPC how the stages of product design and verification are to be documented, and who is responsible for each stage of design.

- 6.9.1.** The manufacturer shall provide:
- a) keeping records of all checks, their results and any corrective actions taken regarding the design process;
 - b) ensure that the records referred to in point a) are sufficiently detailed and accurate to demonstrate that all stages of the design phase and all checks have been carried out successfully.

6.10. Controls during the production process

The manufacturer should specify in the FPC documentation how production is to be planned and carried out, with appropriate controlled conditions.

6.11. Testing and assessment of the product

The manufacturer shall specify in the FPC documentation a procedure that ensures that the specified performance (in accordance with the control plan) is constant.

6.12. Handling, storage and packaging

The manufacturer shall specify in the FPC documentation how the construction product should be packaged and protected to prevent damage or alteration of its performance as specified in the National Technical Assessment.

- 6.12.1.** The manufacturer should:
- a) carry out periodic inspection of the condition of the stored construction product to detect any damage or change in its performance (if applicable);
 - b) identify and guarantee the appropriate environmental conditions for storing the device and monitor them if necessary;
 - c) identify and guarantee specific transport conditions.

6.13. Product traceability

The manufacturer shall specify in the FPC documentation how to ensure that individual products and parts or batches of products are identifiable.

6.13.1. The manufacturer should:

- a) keep records for individual products or batches of products, including production and test information;
- b) be able, on the basis of the records, to reconstruct all relevant information about the product and its manufacturing process. These records should be kept for at least the validity period of the National Technical Assessment.

6.14. Non-compliant products

The manufacturer should specify the handling of non-compliant products in FPC the documentation.

6.14.1. Any instances of non-compliance shall be recorded as soon as they arise and these records shall be retained for at least the duration of the National Technical Assessment.

6.14.2. 2 The manufacturer shall keep at least the information that:

- a) describe the non-compliance
- b) describe what action the manufacturer has taken with regard to the non-compliance;
- c) describe whether and which derogations have been applied
- d) identify the position that decides on action in relation to the non-compliance identified.

6.15. Corrective measures

The manufacturer shall specify in the FPC documentation the course of action to avoid recurrence of non-compliance.

6.15.1. The procedure should include activities related to:

- a) monitoring non-compliance,
- b) correcting non-compliance,
- c) consequences of non-compliance.

6.15.2. In addition, the procedure should include activities related to:

- a) the review and analysis of identified non-compliance;
- b) (where possible) the causes of identified non-compliance;
- c) determining (if possible) whether the identified non-compliance could have occurred earlier.

6.15.3. The manufacturer shall ensure that:

- a) appropriate actions related to the non-compliance will be implemented;
- b) corrective actions related to non-compliance will be subject to verification of their effectiveness;
- c) the compliance of the product with requirements, once the non-compliance has been remedied, will be verified;
- d) appropriate changes are made to the factory production control system

6.16. Complaints

The manufacturer should specify the handling of complaints in the documentation of the FPC.

6.16.1. The FPC documentation shall include complaints reported by the recipients of the products and made by the manufacturer to suppliers of materials and components (sub-assemblies) used in production.

6.16.2. The manufacturer should:

- a) take actions of any complaint made;
- b) keep and archive records relating to complaints

6.16.3. The manufacturer shall keep all records of product complaints and corrective actions relating to those complaints for at least the period of validity of the National Technical Assessment.

6.17. Marking

The manufacturer shall specify in the FPC documentation how the product is to be marked.

6.17.1. The manufacturer shall ensure that:

- a) marking of the product shall be carried out in accordance with this National Technical Assessment;
- b) any other marking applied to the product will not be misleading.

End of the chapter

7.

Instructions

CELO cable assemblies

(cable supporting structures including electric conductors and cables) with electric function support class E30, E60, E90 according to the DIN 4102-12:1998 standard

7. Instruction

- 7.1 The National Technical Assessment CNBOP-PIB is a document stating a positive assessment of the performance for the intended use of the construction product only to the extent resulting from the provisions of this CNBOP-PIB National Technical Assessment.
- 7.2 The National Technical Assessment CNBOP confirms the positive assessment of the product as manufactured by the Manufacturer and submitted by the Applicant for the procedure for issuing the National Technical Assessment. Procedure for issuing the National Technical Assessment CNBOP-PIB does not change or improve the product by imposing on it requirements other than those declared by the manufacturer and different methods of performance testing than those actually used in production of the product in the type tests and in the day-to-day production control.
- 7.3 The National Technical Assessment CNBOP-PIB is not a document authorising the marking of a construction product with a construction mark before it is placed on the market.
- 7.4 CNBOP-PIB assumes no liability for possible infringement of exclusive and acquired rights when granting a National Technical Assessment,
- 7.5 The National Technical Assessment CNBOP-PIB does not infringe any rights arising from the provisions on the protection of industrial property, in particular the Industrial Property Law of 30 June 2000 (i.e. Journal of Laws 2023, item 1170). It is the responsibility of the user of this National Technical Assessment to ensure these powers.
- 7.6 It is the responsibility of the manufacturer who places a construction product on the market to ensure that the product documentation complies with the Polish Language Act. (i.e. Journal of Laws 2024, item 1556). This applies in particular to the naming of goods and services, offers, guarantee conditions, invoices, bills and receipts, as well as warnings and information for consumers required under other legislation, instructions for use and information on the characteristics of goods and services, subject to as indicated in the Act.
- 7.7 The National Technical Assessment CNBOP-PIB may be repealed by CNBOP-PIB, in the event of amendments to separate legislation, standards and regulations laid down by international organisations, if it results from concluded contracts, significant changes in the scientific basis and the state of practical knowledge, and the failure to confirm, during use, a positive assessment of the performance for the intended use of the construction product. The National Technical Assessment CNBOP-PIB may be repealed on its own initiative CNBOP-PIB or at the request of the Chief Construction Supervision Inspector, following an investigation with the participation of the Applicant.

8.

List of documents used in the proceedings

CELO cable assemblies

**(cable supporting structures including electric conductors and cables) with electric
function support class E30, E60, E90 according to the DIN 4102-12:1998 standard**

8. List of documents used in the proceedings

8.1 Documents providing the legal basis for issuing a national technical assessment

Decision No. 1/JOT/WB/16 of 22 June 2016 on the designation of the technical assessment unit (Minister of Infrastructure and Construction: DB.4.6121.1.2016.JK.3/RS).

Act of 16 April 2004 on construction products

(consolidated text: Journal of Laws 2021, item 1213).

Regulation of the Minister of Infrastructure and Construction of 17 November 2016 on national technical assessments (Journal of Laws 2016, item 1968).

8.2 Other national legislation

Regulation of the Minister of Infrastructure and Construction of 17 November 2016 on the manner of declaring the performance of construction products and the manner of marking them with the construction mark (consolidated text: Journal of Laws 2023, item 873).

Regulation of the Minister for Infrastructure of 12 April 2002 on the technical conditions to be met by buildings and their location

(consolidated text: Journal of Laws 2022, item 1225, amended by the Journal of Laws 2023, item 2442, Journal of Laws 2024, item 726).

Regulation of the Minister for Internal Affairs and Administration of 7 June 2010 on the fire protection of buildings, other construction objects and areas

(consolidated text: Journal of Laws 2023, item 822, amended by Journal of Laws 2024, item 1716).

8.3 Standards, technical specifications, guidelines and other documents

PN-N-03010:1983

Statistical quality control. Random selection of product units for sampling

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 4102-12:1998

Fire performance of building materials and components - Part 12: Maintainability of electrical cable assemblies - Requirements and tests

PN-E-79100:2001

Electric cables and wires - Packaging, storage and transportation

8.4 Electric research and calculation reports, assessments, classifications

Research reports:

- no. FIRES-FR-064-14-AUNE of 05.05.2014
- no. FIRES-FR-043-16-AUNE of 28.04.2016
- no. FIRES-FR-142-17-AUNE of 31.08.2017
- no. FIRES-FR-175-18-AUNE of 07.09.2018
- no. FIRES-FR-098-19-AUNE of 13.06.2019
- no. FIRES-FR-032-20-AUNE of 10.03.2020
- no. FIRES-FR-183-20-AUNE of 15.12.2020

- no. FIRES-FR-169-21-AUNE of 08.08.2021
- no. FIRES-FR-165-24-AUNE of 08.08.2024
- no. FIRES-FR-215-24-AUNE of 01.10.2024
- no. FIRES-FR-285-24-AUNE Edition 2 of 10.06.2025

issued by:

FIRES s.r.o., Osloboditeľ'ov 282, 059-35 Batizovce, Slovakia

Classification reports:

- no. FIRES-JR-025-21-NURE of 17.03.2021
- no. FIRES-JR-028-21-NURE of 17.03.2021
- no. FIRES-JR-119-18-NURE of 09.10.2018
- no. FIRES-JR-069-19-NURE of 15.07.2019
- no. FIRES-JR-023-20-NURE of 15.06.2020
- no. FIRES-JR-143-20-NURE of 17.03.2021
- no. FIRES-JR-075-21-NURE of 06.09.2021
- no. FIRES-JR-139-24-NURE of 13.09.2024
- no. FIRES-JR-178-24-NURE of 01.10.2024
- no. FIRES-JR-236-24-NURE of 10.01.2025

issued by:

FIRES s.r.o., Osloboditeľ'ov 282, 059-35 Batizovce, Slovakia

8.5 Documentation

Table 7. List of product applications

Item	Name of the document	Document No.	Date
1.	Application for an extension of the National Technical Assessment with annexes	0072/DOT/KOT/2022	04.10.2022
2.	Application for changes to the National Technical Assessment with annexes	0040/DOT/KOT/2025	11.03.2025

Annexes

Annex A Standardised support structures

Annex B Special support structures

National Technical Assessment edition 2 was prepared by	Grzegorz Mroczko, Junior Brigadier, M.Sc. Eng. Title or equivalent designation, name and surname
National Technical Assessment edition 2 was authorized by	Konrad Zaciera, M.Sc. Eng. Title or equivalent designation, name and surname

In this CNBOP-PIB National Technical Assessment the following changes have been introduced in relation to the National Technical Assessment CNBOP-PIB no. CNBOP-PIB-KOT-2018/2022/0037-3703 edition 1:

- the graphic layout of the document has been updated
- information in the entries in Tables 1 and 2 has been updated according to the results of the study
- information in Annex A and Annex B has been completed in accordance with the results of the study
- the list of research and calculation reports, evaluations, classifications have been

Annex A

Standardised

supporting

structures.

CELO cable assemblies

(cable supporting structures including electric conductors and cables) with electric function support class E30, E60, E90 according to the DIN 4102-12:1998 standard

Annex A Table 1. Standardised supporting structures.

Item	Support structure	Product Drawing/Photo
1	PFT, DFT Cable clip - cable/wire routing on the ceiling - horizontal, vertical and diagonal cable/wire routing on walls - distance between clips max 300 mm - maximum cable diameter 50 mm - maximum number of cables per one PFT clip – 3 - maximum number of cables per one DFT clip - 6	PFT  DFT 
2	F, DF Cable clip - cable/wire routing on the ceiling - horizontal, vertical and diagonal cable/wire routing on walls - distance between clips max 300 mm - maximum cable diameter 50 mm - maximum number of cables per one F clip - 3 - maximum number of cables per one DF clip - 6	F  DF 
3	LI Cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, vertically and diagonally while maintaining an adequate fastening of the cable/conductor by means of a clamp - distance between suspension points max. 300 mm - maximum construction load - 7,5 kg/m - maximum number of cables in a clamp - 4	 
4	CH Cable hanger clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max. 300 mm - maximum construction load - 6 kg/m - maximum number of cables in a clamp - cable harness	

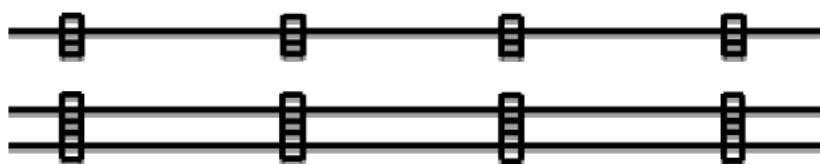


Figure 1 - Supporting structure with cable clamps or brackets. Types with clamps/brackets according to Annex A, Table 1.

CLASSIFICATION OF CABLE ASSEMBLIES ON STANDARDISED CABLE SUPPORTING STRUCTURES

Annex A Table 2. Cable classification of groups 1 – 5 – Standardised supporting structures

BITNER	Cable type	As per design		1	2	3	4
	HTKSH FE 180/PH90	n x 2 x ≥ 0,8 mm, n≥1		E90	E90		
	HTKSHekw FE180/E90	n x 2 x ≥ 0,8 mm, n≥1			E90		
	HDGs FE180/PH120/E90	n x ≥ 1,0 mm², n≥2			E90		
	BITflame® 1000 FE180/PH120/E90	n x ≥ 1,5 mm, n≥1		E90		E90	
TECHNOKABEL	Cable type	As per design		1	2	3	4
	HTKSH PH90	n x 2 x ≥ 0,8 mm, n≥1		E90	E90	E90	E90
	HTKSH FE180 PH90/E30-E90						
	HTKSHekw PH90	n x 2 x ≥ 0,8 mm, n≥1		E90	E90	E90	
	HTKSHekw FE180 PH90/E30-E90						
	HDGs FE 180 PH120/E30-E90	n x ≥ 1,0 mm², n≥2		E90	E90	E90	E90
	HDGsekw FE 180 PH120/E30-E90	n x ≥ 1,0 mm², n≥2		E90	E30		
	HDGs-W FE180 PH120/E30-E90	n x ≥ 1,0 mm², n≥2			E90		
	HLGsekw FE180 PH120/E30-E90	n x ≥ 1,0 mm², n≥2		E90			
	NHXH FE180 PH90/E90	n x ≥ 1,5 mm², n≥2		E90	E90	E60	
(N)HXH FE180 PH90/E90	n x ≥ 1,5 mm², n≥2		E90	E90	E90		
PRAKAB	Cable type	As per design		1	2	3	4
	(N)HXH (PRAFlaDur ® 90 (N)HXH)	n x ≥ 1,5 mm², n ≥ 2		E30			
	F SSKFH-V180 (PRAFlaGuard ® F SSKFH-V180)	n x 2 x ≥ 0,8 mm, n≥1		E90			
VUKI	Cable type	As per design		1	2	3	4
	JE-H(St)H PS90	n x 2 x ≥ 0,8 mm, n≥1		E90			

On the basis of the DIN 4102-12:1998 standard, it is possible to transfer the results obtained from the electrical function support tests of cables or wires laid on standardised cable supporting structures within the meaning of the DIN 4102-12:1998 standard to standardised cable supporting structures of other manufacturers.

The classification of cable assemblies according to the DIN 4102-12:1998 standard, depending on the standardised cable supporting structure and the cable used, is described in the National Technical Assessments for cable assemblies issued by the CNBOP-PIB.

Annex B

Special

supporting

structures

CELO cable assemblies

(cable supporting structures including electric conductors and cables) with electric function support class E30, E60, E90 according to the DIN 4102-12:1998 standard

Annex B Table 1 Special supporting structures.

Item	Support structures	Product Drawing/Photo
1	PFT, DFT Cable clamp - cable/wire routing on the ceiling - horizontal, vertical and diagonal cable/wire routing on walls - distance between clamps max 600 mm - maximum cable diameter 50 mm - maximum number of cables per PFT clamp - 3 - maximum number of cables in a DFT clamp - 6	PFT  DFT 
2	F, DF Cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, vertically and diagonally while maintaining an adequate fastening of the cable/conductor by means of a clamp - distance between clamps max 600 mm - maximum cable diameter 50 mm - maximum number of cables per F clamp - 3 - maximum number of cables in one clamp DF - 6	F  DF 
3	LI Cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, vertically and diagonally while maintaining an adequate fastening of the cable/conductor by means of a clamp - distance between suspension points max 300 mm - maximum number of cables in a clamp - 20	
4	LI Cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, vertically and diagonally while maintaining an adequate fastening of the cable/conductor by means of a clamp - distance between suspension points max 600 mm - maximum number of cables in a clamp - 20	
5	L Cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, vertically and diagonally while maintaining an adequate fastening of the cable/conductor by means of a clamp - distance between suspension points max 300 mm - maximum construction load - 7,5 kg/m - maximum number of cables in a clamp - 20	 

6	L Cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, vertically and diagonally while maintaining an adequate fastening of the cable/conductor by means of a clamp - distance between suspension points max 600 mm - maximum construction load - 7,5 kg/m - maximum number of cables in a clamp - 20	
7	LD Double cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, vertically and diagonally while maintaining an adequate fastening of the cable/conductor by means of a clamp - distance between suspension points max 600 mm - maximum construction load - 2,5 kg/m - maximum number of cables in a clamp - 8 (2 x 4)	
8	CH Cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 600 mm - maximum construction load - 6 kg/m - maximum number of cables in a clamp - cable harness	
9	CHS Cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 300 mm - maximum construction load - 5 kg/m - maximum number of cables in a clamp - cable harness	
10	CHS Cable clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 600 mm - maximum construction load - 5 kg/m - maximum number of cables in a clamp - cable harness	
11	CC Clip - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 300 mm - maximum number of cables in a clip - 3	
12	CC Clip - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 600 mm - maximum number of cables in a clip - 3	

13	CA Tape - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 300 mm - maximum construction load - 2 kg/m - maximum number of cables in tape - 4	
14	CA Tape - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 600 mm - maximum construction load - 2 kg/m - maximum number of cables in tape - 4	
15	PTTR profile, two CELO DIN 975 threaded rods Multitub MT clamp – Fig. 2 - fixing to the ceiling - distance between suspension points - 700 mm - maximum construction load - 10 kg/m	
16	Profil PTTR, obejmą Multitub MT – Fig. 3 - fixing to the wall horizontally - distance between suspension points - 700 mm - maximum construction load - 10 kg/m	
17	CCM Clamp - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 600 mm - maximum construction load - 2,5 kg/m	
18	WDC-M Clip - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 600 mm - maximum construction load - 0,25 kg/m	
19	WSC-M Clip - cable/wire routing on the ceiling - cable/conductor routing on walls horizontally, - distance between suspension points max 600 mm - maximum construction load - 0,1 kg/m	

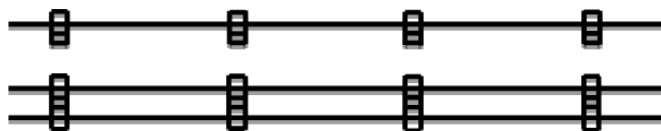


Fig. 1 Support structure with cable clamps or brackets. The design with handles/clamps according to Annex B Table 1.

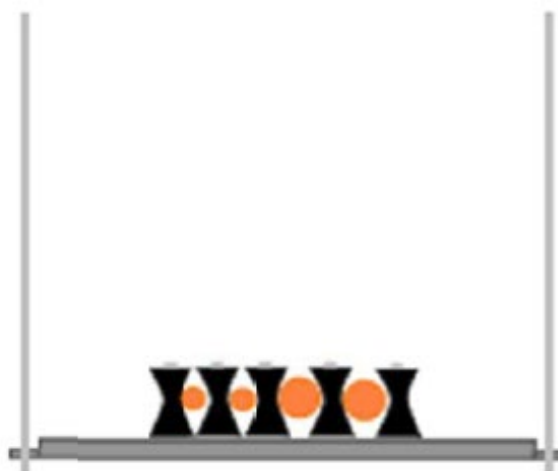


Fig. 2. Special support structure made of PTTR profiles and two CELO DIN 975 M8 threaded rods fixed to the ceiling. The design with Multitub MT clamps



Fig. 3. Special support structure made of PTTR profiles fixed to walls horizontally.

Annex B Table 2. Cable classification of groups 1-7 – Special supporting constructions with cable clamps fixed horizontally to ceilings, walls or steel profiles

BITNER	Cable type	As per design	1	2	3	4	5	6	7
	HTKSH FE180/PH90 E90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E90	E90		E90		E90	E90
	HTKSHekw FE180/PH90/E90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E90	E90	E90			E90	E90
	HDGs FE180/PH120 E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90	E90		E90		E90	E90
	HDGsekwf FE180/PH120/E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90	E90	E90		E90	E90	E60
	HLGs FE180/PH120 E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90						
	NHXXH FE180/PH120/E90 MIKA	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E90	E60				E90	
	NHXXCH FE180/PH120/E90 MIKA	$n \times \geq 1,5/1,5 \text{ mm}^2, n \geq 1$							
	(N)HXXH FE180/PH90/E90	$n \times 1,5 \text{ mm}^2, n \geq 1$		E90				E90	
	BiTflame® 1000 FE180/PH120/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E90	E90				E90	E90
	BiTflame® 1000C FE180/PH120/E90	$n \times \geq 1,5/1,5 \text{ mm}^2, n \geq 1$	E90						
	BiTflame® AS FE180/PH120/E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$							
	BiTflame® AS(St) FE180/PH120/E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$							
TECHNOKABEL	Cable type	As per design	1	2	3	4	5	6	7
	HTKSH PH90		E90	E90				E90	
	HTKSH FE180 PH90/E30-E90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E90	E90				E90	
	HTKSHekw PH90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E60	E90				E90	
	HDGs FE 180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90	E90				E90	
	HDGsekw FE180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E30						
	HDGs-W FE180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90	E90					
	HLGs FE180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90						
	NHXXH FE 180 PH90/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E90	E90		E90			
	NHXXCH FE 180 PH90/E90	$n \times \geq 1,5/1,5 \text{ mm}^2, n \geq 1$	E30	E30					
	NHXXCH SERVO FE 180 PH90/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E30						
	(N)HXXH FE 180 PH90/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E90			E90			
ELKOND	Cable type	As per design	1	2	3	4	5	6	7
	1-CXXH-V-J RE P90-R	$n \times 1,5-10 \text{ mm}^2, n \geq 2$	E90						
PRAKAB	Cable type	As per design	1	2	3	4	5	6	7
	PRAFlaDur® 90 (N)HXXH-J FE180/P90-R...	$n \times 1,5-50 \text{ mm}^2, n \geq 2$	E30						
	PRAFlaGuard® F SSKFH-V180 P90-R...	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E90						
VUKI	Cable type	As per design	1	2	3	4	5	6	7
	JE-H(St)H PS90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E90						
	CHKE-V B2ca PS90	$n \times 1,5-4 \text{ mm}^2, n \geq 2$	E90						

The classification of the cable assemblies according to the DIN 4102-12:1998 standard on special supporting structures are only valid for the tested structure with the specific type of cable tested and are also applicable to those supporting structures with smaller spacings of clamps, brackets, clips, tapes.

Annex B Table 3. Classification of cable groups 8-14 – Special supporting structures with cable clamps fixed horizontally to ceilings, walls or steel profiles.

BITNER	Cable type	As per design	8	9	10	11	12	13	14
	HTKSH FE180/PH90 E90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E90		E90		E90	E90	
	HTKSHekw FE180/PH90/E90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E60		E90	E90	E90		
	HDGs FE180/PH120 E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90		E90	E90	E90		E90
	HDGsekwf FE180/PH120/E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90		E90		E60		
	HLGs FE180/PH120 E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$							
	NHXH FE180/PH120/E90 MIKA	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E90		E90				
	NHXCH FE180/PH120/E90 MIKA	$n \times \geq 1,5/1,5 \text{ mm}^2, n \geq 1$	E90						
	(N)HXH FE180/PH90/E90	$n \times 1,5 \text{ mm}^2, n \geq 1$							
	Bitflame® 1000 FE180/PH120/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E90		E90				
	Bitflame® 1000C FE180/PH120/E90	$n \times \geq 1,5/1,5 \text{ mm}^2, n \geq 1$	E60		E90				
	Bitflame® AS FE180/PH120/E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$							
	Bitflame® AS(St) FE180/PH120/E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E60		E90				
TECHNOKABEL	Cable type	As per design	8	9	10	11	12	13	14
	HTKSH PH90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E90	E90	E90		E90		
	HTKSH FE180 PH90/E30-E90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E90	E90	E60				
	HTKSHekw PH90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$	E90	E90	E60				
	HDGs FE 180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90	E90	E90		E60		
	HDGsekw FE180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E30		E30		E30		
	HDGs-W FE180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$	E90	E90	E90		E90		
	HLGs FE180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$							
	NHXH FE 180 PH90/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E30	E30	E90				
	NHXCH FE 180 PH90/E90	$n \times \geq 1,5/1,5 \text{ mm}^2, n \geq 1$	E90						
	NHXCH SERVO FE 180 PH90/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E30						
	(N)HXH FE 180 PH90/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E90						
ELKOND	Cable type	As per design	8	9	10	11	12	13	14
	1-CXKH-V-J RE P90-R	$n \times 1,5-10 \text{ mm}^2, n \geq 2$							
PRAKAB	Cable type	As per design	8	9	10	11	12	13	14
	PRAFlaDur® 90 (N)HXH-J FE180/P90-R...	$n \times 1,5-50 \text{ mm}^2, n \geq 2$							
	PRAFlaGuard® F SSKFH-V180 P90-R...	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$		E90	E90				
VUKI	Cable type	As per design	8	9	10	11	12	13	14
	JE-H(St)H PS90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$		E90	E90				
	CHKE-V B2ca PS90	$n \times 1,5-4 \text{ mm}^2, n \geq 2$							

The classification of the cable assemblies according to the DIN 4102-12:1998 standard on special supporting structures are only valid for the tested structure with the specific type of cable tested and are also applicable to those supporting structures with smaller spacings of clamps, brackets, clips, tapes.

Annex B Table 4. Classification of cable groups 15-19 – Special supporting structures with cable clamps fixed horizontally to ceilings, walls or steel profiles.

BITNER	Cable type	As per design	15	16	17	18	19
	HTKSH FE180/PH90 E90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$				E90	
	HTKSHekw FE180/PH90/E90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$				E60	
	HDGs FE180/PH120 E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$				E90	
	HDGsekwf FE180/PH120/E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$				E90	
	HLGs FE180/PH120 E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$					
	NHXH FE180/PH120/E90 MIKA	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$		E60			
	NHXCH FE180/PH120/E90 MIKA	$n \times \geq 1,5/1,5 \text{ mm}^2, n \geq 1$					
	(N)HXH FE180/PH90/E90	$n \times 1,5 \text{ mm}^2, n \geq 1$					
	BiTflame® 1000 FE180/PH120/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$	E90	E90	E90		
	BiTflame® 1000C FE180/PH120/E90	$n \times \geq 1,5/1,5 \text{ mm}^2, n \geq 1$		E60			
	BiTflame® AS FE180/PH120/E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$					E90
	BiTflame® AS(St) FE180/PH120/E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$					E60
TECHNOKABEL	Cable type	As per design	15	16	18	19	20
	HTKSH PH90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$					
	HTKSH FE180 PH90/E30-E90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$					
	HTKSHekw PH90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$					
	HDGs FE 180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$					
	HDGsekw FE180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$					
	HDGs-W FE180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$					
	HLGs FE180 PH120/E30-E90	$n \times \geq 1,0 \text{ mm}^2, n \geq 2$					
	NHXH FE 180 PH90/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$		E60			
	NHXCH FE 180 PH90/E90	$n \times \geq 1,5/1,5 \text{ mm}^2, n \geq 1$		E60			
	NHXCH SERVO FE 180 PH90/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$					
	(N)HXH FE 180 PH90/E90	$n \times \geq 1,5 \text{ mm}^2, n \geq 1$					
ELKOND	Cable type	As per design	15	16	18	19	20
	1-CXKH-V-J RE P90-R	$n \times 1,5-10 \text{ mm}^2, n \geq 2$					
PRAKAB	Cable type	As per design	15	16	18	19	20
	PRAFlaDur® 90 (N)HXH-J FE180/P90-R...	$n \times 1,5-50 \text{ mm}^2, n \geq 2$					
	PRAFlaGuard® F SSKFH-V180 P90-R...	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$					
VUKI	Cable type	As per design	15	16	18	19	20
	JE-H(St)H PS90	$n \times 2 \times \geq 0,8 \text{ mm}, n \geq 1$					
	CHKE-V B2ca PS90	$n \times 1,5-4 \text{ mm}^2, n \geq 2$					

The classification of the cable assemblies according to the DIN 4102-12:1998 standard on special supporting structures are only valid for the tested structure with the specific type of cable tested and are also applicable to those supporting structures with smaller spacings of clamps, brackets, clips, tapes.

**END OF
THE NATIONAL
TECHNICAL
ASSESSMENT
No. CNBOP-PIB -KOT
-2018/2022/0037-3703
Edition 2**

**CELO cable assemblies
(cable supporting structures including electric conductors and cables) with electric
function support class E30, E60, E90 according to the DIN 4102-12:1998 standard**