

**Józef Tuliszkowski Scientific and Research Centre for Fire  
Protection Przeciwpożarowej  
The State Research Institute**  
ul. Nadwiślańska 213, 05-420 Józefów k/Otwocka

tel. +48 22 7693 300; fax +48 22 7693 356  
[www.cnbop.pl](http://www.cnbop.pl) e-mail: [cnbop@cnbop.pl](mailto:cnbop@cnbop.pl)



## Series: Technical Approvals

### **TECHNICAL APPROVAL CNBOP-PIB AT-0605-0270/2010/2015**

**This Technical Approval replaces the Technical Approval  
CNBOP AT-0605-0270/2010, 4rd Edition**

Pursuant to decision by the Minister of Infrastructure, dated 8<sup>th</sup> November 2004, on technical approvals at organizational units authorized to issue them (Journal of Laws No.249, item 2497), and as result of the approval procedures carried out at the Scientific and Research Centre for Fire Protection in Józefów/Otwock on request of the company:

**BAKS Wytwarzanie Osprzętu Instalacyjno – Elektrotechnicznego**  
**Kazimierz Sielski**

this is to certify that the product:

**Cable Connection and Fastening Systems of BAKS**  
(support structures with electric cables and wires, with electric function  
maintenance -class E30, E60, E90,  
acc. to DIN 4102-12:1998-11

**Support structure manufacturer: BAKS**

**Cable and wire manufacturers: BITNER, DÄTWYLER, ELKOND, EUPEN, FACAB  
LYNEN, NEXANS, PRAKAB, LEONI STUDER,  
TECHNOKABEL, TELE-FONIKA KABLE, MADEX,  
KABTEK, ELPAR, NKT**

has been admitted for application in the building industry.

The product usability and the range and conditions of application have been defined by an Annex-the integral part of this CNBOP-PIB Technical Approval.

#### **Date of expiry:**

from 10 February 2015  
to 9 February 2020

#### **Annex**

General and Technical provisions

Józefów, 21 January 2015

*stamp:* Józef Tuliszkowski Scientific and  
Research Center for Fire Protection  
The State Research Institute

*stamp:* Deputy Head for the  
Certifications and Approvals  
/-/signature  
mł. bryg. mgr inż. Jacek Zboina

This Technical Approval CNBOP-PIB AT-0605-0270/2010/2015 consists of 60 pages. The text may only be copied in its entirety. Publishing or disseminating fragments of this Technical Approval in any other form (including distribution in the electronic form) requires written consent from the Scientific and Research Centre for Fire Protection-The State Research Institute.

**THE ANNEX****CONTENT****1 SUBJECT OF APPROVAL**

- 1.1 General technical characteristics of the product
- 1.2 Subdivision of products
- 1.3 Product marking and labeling

**2. INTENDED USE, SCOPE AND CONDITIONS OF APPLICATION**

- 2.1 Intended use
- 2.2 The scope and conditions of application

**3 TECHNICAL PROPERTIES AND REQUIREMENTS**

- 3.1 Construction
- 3.2 Technical properties

**4 PACKAGING, STORAGE, TRANSPORT**

- 4.1 Packaging
- 4.2 Storage
- 4.3 Transport

**5 CONFORMITY ASSESSMENT**

- 5.1 General principles
- 5.2 Preliminary testing of the product type
- 5.3 Factory Control of Production (FPC)
- 5.4 The finished product testing
- 5.5 Methods of testing
- 5.6 Product sampling
- 5.7 Evaluation of the testing results

**6 FORMAL ARRANGEMENTS****7 DATE OF EXPIRY****ADDITIONAL INFORMATION**

## GENERAL AND TECHNICAL PROVISIONS

### 1. SUBJECT OF APPROVAL

#### 1.1 General technical characteristics of the product

This Technical Approval CNBOP-PIB refers to the Cable Connection and Fastening Systems of BAKS – the sets of products consisting of support structures of BAKS and cables supplied by the indicated manufacturers.

The Cable Connection and Fastening Systems of BAKS **assure continuous electric power supply under fire** for the period of time required to put in motion and activate the devices used for fire protection<sup>1</sup>, and have been assigned to the **electric function maintenance class E30, E60 lub E90**, acc. to DIN 4102-12 standard. The detailed classification in relation to the type and model of the cable and support structure used has been shown in Table 13.

The maintenance of function in the Cable Connection and Fastening System shall be understood as continuous supply of electric power and information signals (e.g. in the emergency power supply routes) at fire temperature determined by the normalized curve (ETK) for 30, 60 or 90 minutes in static rated load conditions.

The division of Cable Sets of BAKS is as follows:

- The Standard Cable Sets, of construction which complies with point 7.3.3.3, of the DIN 4102-12:1998 standard.
- The In Excess of the Standard Cable Sets, of construction having other parameters than the parameters defined in point 7.3.3.3, of the DIN 4102-12:1998 standard, in relation to the method of fastening, thickness of material, and the and type of foundation, e.g. mesh trays, constructions with increased spacing of the suspension points, etc.

The Test procedure relating to the Standard Cable Sets and In Excess of the Standard Cable Sets is compliant to DIN 4102-12:1998.

In Table 8 of this Approval a **Classification of the Cable Sets** has been identified according to the DIN 4102-12 standard, confirmed by the numerous test results in relation to the applied arrangement of the **Standard** carrying construction of the cables, and the type of cables which have been used.

In Tables 9-12 of this Approval a **Classification of the Cable Sets** has been identified according to the DIN 4102-12 standard, confirmed by the numerous test results in relation to the applied arrangement of the **In Excess of the Standard** carrying construction of the cables, and the type of cables which have been used.

The evaluation of the Cable Connection and Fastening Systems of BAKS in terms of the electric function maintenance (continuous supply of the electric power and signal transmission) with consideration of the type of applied foundation and the type of fastening to the foundation shall be made in accordance with conditions stipulated:

- by the Polish Standard relating to the fire resistance testing PN-EN 1363-1 – Fire resistance testing – Part 1, General requirements
- The Ordinance by the Minister of Infrastructure dated 12 March 2009 to amend the ordinance on technical conditions of the buildings and their location.
- in the DIN 4102-12 standard – Fire specification of materials and construction elements-Part 12; Maintenance of electric functions in the Cable Connection and Fastening Systems- Requirements and testing.

The Cable Connection and Fastening Systems range of application has been limited to the

<sup>1</sup> Pursuant to the ordinance by the Minister of Infrastructure, dated 12th April 2002, on technical conditions for the buildings and their location (Journal of Laws No. 75, item. 690, as amended), relating in particular to the amendment to the ordinance dated 12th March 2009 (Journal of Laws No. 56, item 461), valid and in force as of 8<sup>th</sup> July 2009.

cables with the rated voltage not exceeding 1kV

For the purpose of the approval proceedings the cable connection and fastening systems was submitted by the manufacturer, designed for **installation of the fire protection devices** with the minimum time of functions maintenance for 30, 60 and 90 minutes.

**Subject to Point 2.2 of this Technical Approval** the Cable Connection and Fastening Systems of BAKS shall comprise the elements of BAKS support structures specified in Table 1, and the cables supplied by the manufactures mentioned in table 2.

Table 1

CABLE TRAY SYSTEM		
No.	Product	Symbol
1	Cable tray	KGL/KCL/KPL50H60 KCL100 - 300H60, KCL/KCOL100 - 300H60 KCJ100 - 400H60, KCJ/KCOJ100 - 400H60 KGL100 - 300H60, KGL/KGOL100 - 300H60 KGJ100 - 300H60, KGJ/KGOJ100 - 400H60 KFL100 - 300H60 KFJ100 - 400H60 KBL100 - 300H50 KBL100 - 300H60 KBJ100 - 400H60 KCD100 - 400H60, KCD/KCOD100 - 400H60 KCP100 - 600H60, KCP/KCOP100 - 600H60
2	Straight connector	LPPH60, LPP/LPOPH60N LPLPH60 LKJH, LKJ/LKOJH60
3	Articulated connector	LGJH60, LGPH60N, LGP/LGOPH60N
4	Joint protection plate	BL100 - 600N, BL/BLO100 - 600N
5	Edge protection plate	BZK100 - 600N, BZK/BZKO100 - 600N
6	System fittings for cable tray: knee, <u>reduction</u> knee, <u>tee</u> , reduction tee, crossing, reduction, bend piece, bend, by-pass, branching connector, etc.** (the fitting material thickness shall be not less than the thickness of a cable tray plate)	KK... KR... TK... TR... CZK... RK... EL..., LL..., LU... OP... LR... itp.
7	Covers for trays and fittings (thickness of the cover sheet not less than tray sheet).	PK..., PZK... PKK..., PZKK PTK..., PZTK... PCZK, PZCZK PRK, PTR ect.
8	Cover clamp	ZPN..., ZPB..., ZAP...
WIRE MESH CABLE TRAY SYSTEM		
9	Wire mesh tray	KDS60 - 600H60, KDS/KDSO60 - 600H60 KDSZ60-400H60 KGS60 - 100H60 KSG60 - 600H60
10	Mesh tray coupler	Grip USSP Screw grip USSN, USSN/USSO Screw grip USSPW, USSPW/USSPWO Screw grip USSW

		Screw grip for reinforcement USKS
11	System of fittings for wire mesh trays: - made through cutting out the rods and bolting with the use of grips - with the use of system fittings: knee, tee	- number of cut-outs 2-12, USSN, USSN/USSO, USSPW, USSPW/USSPWO, ZS, ZS/ZSO, PLC... -KKS TKS itp.
<b>CABLE LADDER SYSTEM</b>		
12	Cable ladder	DGOD100 - 400H60N DGOP100 - 600H60N DUD100 - 400H60N, DUD/DUOD100 -400H60N DUP100 - 400H60N, DUP/DUOP100 - 400H60N DSH100-400H80
13	Straight connector	LDCH60N, LDC/LDOCH60N LKDC60, LKDC/LKDOCH60 LKUC3, LDDK...
14	Articulated connector	LGCH60N, LGC/LGOCH60N, LDDCH60N
15	System fittings for cable ladder: horizontal bend, tee, crossing, etc	LD... LPD... TD... CZ... RD... ZDK... etc.
16	Covers for ladders and fittings (thickness of the cover sheet not less than ladder sheet).	PDD... , PZDD... PLD... , PZLD... PTD... , PZTD... PCZD... , PZCZD... PRD... , PZRD... PLPD... , PZLPD... etc..
17	Cover clamp	ZAP...
<b>WALL TRUNKING SYSTEM</b>		
18	Wall trunking	KS115-170H68
19	Notched connector	LKS
20	System fittings for wall trunks: bends, tees, blind ends, clamps	KWKS... KZKS... KPKS... TSKS... NM... ZK... itp.
21	Cover for wall trunking	PKS
22	Flat spring	SU
<b>ACCESSORIES</b>		
23	Bracket	WMC100 – 600, WMC/WMCO100 - 600
24	Bracket	WWCT100 – 400, WWCT/WWCTO100 - 400
25	Bracket	WWS100 – 400, WWS/WWSO100 - 400
26	Bracket, side holder	WPT100,WPT/WPTO100,WPTKO100–400,WC...
27	Bracket	WWCH100-600
28	Bracket-variable	WU100 – 400, WU/WUO100 - 400
29	Bracket	WFL/WFLO100 -500 WFC/WFCO100 - 400
30	Fastening bracket	UTM, UTM/UTMO, UT
31	Ceiling bracket	WPCW, WPCW/WPCO...
32	Ceiling bracket	WPCE, WPCE/WPCEO...
33	Ceiling bracket	WPCB...

34	Hold down clamp	ZM, ZM/ZMO, NKH
35	Support channel	CWP40H22/..., CWP40H40/..., CWP/CWOP40H40/..., LC..., DPH...
36	Snap-in support	PMC, PMC/PMCO..., PMCN...
37	Rod grip	UPW, UPW/UPWO UPWK, UPWK/UPWKO
38	Cable clamp	UK1, UK1/UKO1... UK2, UK2/UKO2... UKZ1, UKZ1/UKZO1...
39	Cable band	OPK
40	Rung	SDP..., SDP/SDOP... SDC..., SDC/SDOC...
41	Rod hanger	USV..., USV/USOV US12..., US12/USO12
42	Trapezoidal ceiling bracket	WPPGV, WPPGV/WPPOV WKPO
43	Fastening clamp, bracket adapter	NKH OD
44	Cable clip	UDF..., UDFB... UEF..., UEFB...
45	Cable clip	KSA...
46	Cable hanger	OZ, OZ/OZO OZS, OZS/OZSO OZM, OZM/OZMO
47	Thin-walled tubes	RU...
48	Beam clamp	ZK..., ZC..., ZSU3
49	Hold down clamp	UDC
50	Trapezoidal ceiling bracket	WT..., WT/WTO...
51	Pipe clip	OBR...
52	Head-plate-variable	PSUN, PSUN/PSUNO
53	Cable protection piece	RO1...
54	Screw	K M6X15
55	Spacer	PD11
56	Spacer	BR...
<b>JUNCTION BOX FOR CONNECTING OR BRANCHING</b>		
57	Junction box	PMO1/... , PMO1/...E PMO2/... , PMO2/...E PMO3/... , PMO3/...E PMO3B/... , PMO3B/...E
58	Cable gland	-----
59	Mounting plate	UP... UPU UPP... UPPO...
<b>SCREW ELEMENTS</b>		
60	Anchor bolt	SRO... (HK M6/4; KDM) SRBO... (HK M6/0) PSR... (FWA; R-HPTIIF; MTP AP) PSRO... (FBN II; R-HPTIIF; MTP AP) PSRZ... (FAZ II) STR... STS... (R-RBP) GSO... (FDN; DBZ 6/4,5; T-DN) KWBO... (FNA II) SBO... (FBS; HUS-P) SBSO... (FBS) KKG... (HM) MKR... (FMD)

		SKT... (SFI; SDU)
61	Drop-in anchor	TRSO... (HKD; EA II; EM; DM-PRO) TRSK... (HKD; EA II) KSKO...(FHY)
62	Self drilling screw*	SMD... (S-MD03PZ 4,8x16)
63	Powder-actuated fastener*	GWT... (R-KNC)
64	Chemical anchors*: threaded rod, glass ampoule, injection mortar	PGS... (FTR) AS (FEB RM) ZI300 (FIS VT 300 T)
62	Screw set	SGN... SGF... SGK... SGKF... SM... SRM...
63	Nut	NS... NR...
64	Washer	PP... PW...
65	Rod connector	NL...
66	Threaded rod	PG...

\* - trade name used by BAKS

Table 2

No.	Manufacturer	Cable types
1.	<b>Zakłady Kablowe BITNER</b> Celina Bitner ul. Friedleina 3/3 30-009 Kraków, Poland	NHXH FE180/E30 MICA, NHXH FE180/E90 MICA, NHXCH FE180/E30 MICA, NHXCH FE180/E90 MICA, (N)HXH FE180/E30 CERAMIC, (N)HXH FE180/E90 CERAMIC, (N)HXCH FE180/E30 CERAMIC, (N)HXCH FE180/E90 CERAMIC JE-H(St)H E90 MICA, JE-H(St)H E90 CERAMIC HTKSH(ekw)
2.	<b>DÄTWYLER</b> Kabel+Systeme GmbH Lilienthalstrasse 17 DE-85399 Hallbergmoos, Germany	(N)HXH FE180/E90, (N)HXCH FE180/E90, (N)HXCH FE180/E30-E60 JE-H(St)H FE 180/E30-E90, JE-H(St)HRH Bd FE 180 E30-E90 PH90
3.	<b>ELKOND HHK a.s.</b> Oravicka 1228 028 01 Trstena, Slovakia	N2XH FE180/P30, N2XH FE180/P60, NHXH FE180/P90, JE-H(St)H FE180/P30, JE-H(St)H FE180/P90
4.	<b>Kabelwerk EUPEN AG</b> Malmedyer Str. 9 B-4700 Eupen, Belgium	NHXCH-J FE 180/E90, NHXCH FE 180/E90, (N)HXCH FE 180/E90 JE-H(St)H FE 180/E90, NHXH-J FE 180/E90
5.	<b>Nexans</b> <b>Deutschland Industries GmbH</b> Kabelkamp 20 30179 Hannover, Germany	N2XH, N2XCH, N2XH E30 i E 60, N2XCH E30 i E 60, N2XCH E90, NHXMH, NHXMH B+ E30, N2XH-J FE180 E30, N2XCH FE180, N2XH-J FE180 E90, N2XCH FE180 E90
6.	<b>FACAB Lynen</b> Dürener Str. 340 D-52249 Eschweiler, Germany	NHXH FE 180/E90, NHXCH FE 180/E90, JE-H(St)H FE 180/E90

7.	<b>PRAKAB PRAŽSKÁ KABELOVNA</b> a.s. Ke Bablu 278 102 09 Praha 15, The Czech Republic	PRA FlaDur 1-CSKH-V180-0 P30-R, PH120-R B2ca s1d0, PRA FlaDur 1-CSKH-V180-0 P30-R
8.	<b>LEONI Studer AG</b> Herrenmattstrasse 20 CH-4658 Däniken, Switzerland	BETAFLAM (N)HXCH FE 180/E90, BETAFLAM (N)HXCH FE 180/E30 – E60, BETAFLAM (N)HXH-J FE 180/E30-E60, JE-H(St)H...Bd FE 180/E30 – E90, JE-H(St)HRH...Bd FE 180/E30 - E90, (N)HXH-J FE180/E90.
9.	<b>TECHNOKABEL S.A.</b> Nasielska 55 04-343 Warszawa, Poland	(N)HXH FE180 PH30/E30-E60, (N)HXH FE180 PH90/E90, (N)HXCH FE180 PH30/E30-E60, (N)HXCH FE180 PH90/E90, JE-H(St) H FE 180 PH90/E30-E90, HTKSH, HTKSHekw, HTKSH PH90/E30-E90, HTKSHekw PH90/E30-E90, HDGs FE180 PH90/E30-E90 300/500V, HDGsekw FE180, PH90/E30-E90 300/500V, HLGs FE180 PH90/E30-E90 300/500V, HLGsekw FE180 PH90/E30-E90 300/500V.
10.	<b>TELE-FONIKA KABLE</b> Sp. z o. o. S.K.A. ul. Wielicka 114 30- 663 Kraków, Poland	(N)HXCH FE 180/E90, (N)HXH-J FE 180/E90, (N)HXH J FE 180/E90 JE-H(St)H Bd FE180/E90
11.	<b>Fabryka Kabli MADEX s.j.</b> Stefanówka ul. Żurawia 96 05-462 Wiązowna, Poland	NHXCH FE180 PH90/E90, NHXH FE180 PH90/E90 HTKSH PH90, HTKSHekw PH90
12.	<b>KABLOTEK KABLO</b> Alipasa mevkii Sanayi 12 Sokak No:7 Silivri-Istanbul, Turkey	JE-H(St)H FE180/E90, JE-H(St)H FE190/E30 NHXH-O FE180/E90, NHXH-O FE180/E90, (N)HXH-O FE180/E30 LINCH FE180/E90
13.	<b>Fabryka Kabli ELPAR Sp. z o.o.</b> Ul. Laskowska 1 21-200 Parczew Polska	NHXH E90, NHXCH E90, (N)HXH E90, (N)HXCH E90 HDGs E9 PH90, HTKSH FE180/PH90
14.	<b>NKT Cables Group,</b> Düsseldorfer Strasse 400, Chempark D-51061 Cologne Germany	NHXH E30, NHXH E90

#### 1.1.1. Production plant name and address

Cable support structures of BAKS- name and address of the production plant

- BAKS Wytwarzanie Osprzętu Instalacyjno-Elektrotechnicznego, Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew

Cables and wires- name and address of the manufacturer:

- Zakłady Kablowe BITNER Celina Bitner, 32-353 Trzyciąż k/Krakowa
- DÄTWYLER Kabel+Systeme GmbH, Lilienthalstrasse 17, DE-85399 Hallbergmoos,
- ELKOND HHK a.s., Oravicka 1228, 028 01 Trstena
- Kabelwerk EUPEN AG, Malmedyer Str. 9, B-4700 Eupen
- Nexans Deutschland Industries GmbH, Kabelkamp 20, 30179 Hannover
- FACAB Lynen, Dürener Str. 340, D-52249 Eschweiler
- PRAKAB PRAŽSKÁ KABELOVNA, a.s. Ke Bablu 278, 102 09 Praha 15
- STUDER Draht- und Kabelwerk AG, CH-4658 Däniken
- Fabryka Kabli TECHNOKABEL w Szreńsku, ul. Wiatraczna 28, 06-550 Szreńsk k/Mławy
- TELE-FONIKA KABLE Sp. z o. o. S.K.A., ul. Wielicka 114, 30- 663 Kraków



- Fabryka Kabli MADEX Stefanówka ul. Żurawia 96, 05-462 Wiązowna
- KABLOTEK KABLO Alipasa mevkii Sanayi 12, Sokak No:7 Silivri – Istanbul
- Fabryka Kabli ELPAR Sp. z o.o. ul. Laskowska 1, 21-200 Parczew
- NKT cables s.r.o., Průmyslová 1130, 272 01 Kladno; NKT cables a/s, Toftegårdsvej 25, DK-4550 Asnaæs; NKT cables Vrchlabi s.r.o., Člen skupiny NKT, Českých bratří 509, 543 14 Vrchlabi,

## 1.2 Subdivision of products

Cable support structures as a part of the Cable Connection and Fastening Systems of BAKS are made of materials which are resistant to the abrasive environmental conditions. For that purpose the products covered by the E-30, E-90 systems have been manufactured of the following 4 types of material:

- steel and wire, galvanized acc. to PN-EN ISO 2081;
- galvanized steel, acc. to the Sendzimir method, acc. to PN-EN 10327;
- steel, hot-dip galvanized to PN-EN 1461;
- stainless steel and wire in grade 1.4... (acc. to the European standard PN-EN 10088).

In addition, the above mentioned types of material are subject to powder coating with the use of polyurethane or epoxy, or they can be painted with acrylic paint.

**The types and labeling of cables incorporated to the Cable Connection and Fastening Systems of BAKS- see table 3 below.**

**Table 3**

Marking and labeling	Cable type
<b>HTKSH</b>	Telecommunication (T) cables (K) station type (S) unshielded, with copper single-strand conductors and halogen-free insulation flame retardant, with low smoke emission (H)
<b>HTKSHekw</b>	Telecommunication (T) cables (K) station type (S), shielded (ekw), with copper single-strand conductors and halogen-free insulation, flame retardant, with low smoke emission (H) and halogen-free coating, flame retardant, with low smoke emission (H)
<b>NHXXH</b>	Power cables (N) with copper conductors and double insulation of mica tape and halogen-free cross-linked material, flame retardant, with low smoke emission (HX), equipped with filling coating and the coating of halogen-free material flame retardant, with low smoke emission (H)
<b>NHXXCH</b>	Power cables (N) with copper conductors and double insulation of mica tape and halogen-free cross-linked material, flame retardant, with low smoke emission (HX), equipped with filling coating and the coating of halogen-free material, flame retardant, with low smoke emission (H), and with coaxial conductor in the form of spiral circuit on the filling coating (C)
<b>JE-H(St)H</b>	Telecom installation cables (JE), with insulation and coating made of halogen-free material, flame retardant, with low smoke emission (H), in the joint shield in the centre (St)
<b>N2XH</b>	Power cables (N) with copper conductors and conductor insulation made of cross-linked polyethylene (2X), equipped with filling coating and the coating of halogen-free material flame retardant, with low smoke emission (H)
<b>N2XCH</b>	Power cables (N) with copper conductors and conductor insulation made of cross-linked polyethylene (2X), equipped with filling coating and the coating of halogen-free material flame retardant, with low smoke emission (H), and with coaxial conductor in the form of spiral circuit on the filling coating (C)
<b>HDGs</b>	Cables with copper single-strand conductors (D), specialty silicone rubber insulation (Gs), and the coating of halogen-free material flame retardant, with low smoke emission (H)
<b>HDGsekw</b>	Cables with copper single-strand conductors (D), specialty silicone rubber insulation (Gs) and the coating made of halogen-free material, flame retardant, with low smoke emission (H), and the joint shield in the centre (ekw)

Marking and labeling	Cable type
<b>HLGs</b>	Cables with copper multi-strand conductors (L) with specialty silicone rubber insulation (Gs) and the coating made of halogen-free material, flame retardant, with low smoke emission (H)
<b>HLGsekw</b>	Cables with copper multi-strand conductors (L), specialty silicone rubber insulation (Gs) and the coating made of halogen-free material, flame retardant, with low smoke emission (H), and a joint shield in the centre (ekw)
<b>PH 30</b> <b>PH 90</b>	Cables designed to maintain the circuit continuity (the actual conductivity or signal transmission) acc. to PN-B-02851-1, measured in minutes. (the testing carried out acc. to PN-EN 50200)
<b>E 30</b> <b>E 60</b> <b>E 90</b>	Cables with cable support structure (part of the Cable Connection and Fastening System) designed to maintain the electric functions measured in minutes. (the testing carried out acc. to DIN 4102-12)
<b>FE 180</b>	Cables designed to provide circuit continuity (the actual conductivity or signal transmission) measured in minutes (the testing carried out acc. to PN-IEC 60331-21, in static conditions and temperature of 750° C)

### 1.3 Marking and labelling

Cable support structures of BAKS are identified based on the manufacturer's catalogue. Due to the method of production technology placing product symbol on particular elements is not possible- the products are labeled mechanically only with the manufacturer's logo or/ and with a sticker for the product identification.

Subject to labeling are packages with the following information placed:

1. Manufacturer's name and address
2. Product symbol.
3. Product catalogue number.
4. Number of pieces per packet.

Marking of cables shall be as follows

- symbol of the cable with description of the number of pairs x number of conductors in a pair x conductor diameter
- trademark,
- year of production.

## 2. INTENDED USE, SCOPE AND CONDITIONS OF APPLICATION

### 2.1 Intended use

Cable support structures of BAKS with electric and telecom cables of the manufacturers indicated in Table 2 of this Technical Approval are allowed for application as the Cable Support and Fastening Systems in the electric power supply and control systems relating to the fire protection equipment and devices.

The Cable Support and Fastening Systems described in this Technical Approval have been classified to the electric function maintenance class E30, E60, E90, acc. to DIN 4102-12, pursuant to § 187.3. of the

ordinance by the Minister of Infrastructure dated 12th March 2009, amending the ordinance on technical conditions in relation to the buildings and their location (Journal of Acts No. 56, item 461) to assure continuous electric power supply and signal transmission for the time of 30, 60 and 90 minutes required to put in motion and activate the fire protection device. The Cable Sets placed in premises protected by fixed water-based fire-extinguishing equipment are water resistant provided that the cables and wiring comply with the above mentioned requirement which has been confirmed by the Technical Approval \_CNBOP-PIB.

The evaluation of the Cable Connection and Fastening Systems of BAKS in terms of the electric function maintenance (continuous supply of the electric power and signal transmission) with consideration of the type of applied foundation and the type of fastening to the foundation shall be made in accordance with conditions stipulated by the Polish Standard relating to the fire resistance testing PN-EN 1363-1 – Fire resistance testing –Part 1, General requirements, and in the DIN 4102-12 standard – Fire specification of materials and construction elements-Part 12; Maintenance of electric functions in the Cable Connection and Fastening Systems- Requirements and testing.

At laying the cables or wiring of E30 - E90 fire resistance rating outside the building (outside the separated fire zone) the cable route shall be used which is resistant to atmospheric conditions and which is a satisfactory protection of a cable route against UV radiation. Segregation of cables shall be maintained with fastening to any foundation which assures stability of the cable route under construction..

## 2.2 The Scope and conditions of application

The cable support structures of BAKS are allowed for application in the Cable Connection and Fastening Systems under the following conditions:

- if the requirements of this Technical Approval are met, which shall be confirmed by positive testing results of the Cable Connection and Fastening System (cables and their supports), acc. to PN-EN 1363-1 and DIN 4102-12 standards (reports from testing – see pages 31-34 of this Technical Approval), and
- if the product assessment compliance was made by the manufacturer or supplier of the support structures, resulting in issuing by CNBOP-PIB the certificate of compliance for conformity with this Technical Approval, in relation to the support structures. The certificate of compliance issued by the CNBOP-PIB is a confirmation that the basic requirements relating to the support structures have been met.

The cables and wires are allowed for application in the Cable Connection and Fastening Systems under the following conditions:

- if the requirements of this Technical Approval are met, which shall be confirmed by positive testing results of the Cable Connection and Fastening System (cables and their support), acc. to PN-EN 1363-1 and DIN 4102-12 standards (reports from testing – see pages 31-34 of this Technical Approval), and
- if the product assessment compliance was made by the manufacturer or supplier of the cables and wires, resulting in issuing by CNBOP-PIB the certificate of compliance for conformity with this Technical Approval, in relation to the cables. The certificate of compliance issued by the CNBOP-PIB is a confirmation that the basic requirements relating to the cables have been met.

**Acceptable load and technical parameters of the Cable Connection and Fastening Systems of BAKS** shall comply with the manufacturer's catalogue, and Tables 4, 5, 6, 7.

**Table 4**

<b>BASIC PARAMETERS OF CABLE TRAY FASTENING – galvanized steel or stainless steel</b>		
<b>PARAMETER'S NAME</b>	<b>PARAMETER'S VALUE</b>	
	<b>Symbol</b>	<b>Sheet thickness</b>
Cable tray type	KGL/KCL/KPL50H60	0,7 mm
	KCL100 - 300H60; KCL/KCOL100 -300H60 *	0,7 mm
	KGL100 - 300H60; KGL/KGOL100 - 300H60 *	0,7 mm
	KFL100-300H60 *	0,7 mm
	KBL100-300H60 *	0,7 mm
	KBL100-300H50 *	0,7 mm
	KCJ100 - 400H60; KCJ/KCOJ100 - 400H60 *	1,0 mm

BASIC PARAMETERS OF CABLE TRAY FASTENING – galvanized steel or stainless steel		
	KGJ100 - 400H60; KGJ/KGOJ100 - 400H60 * KFJ100-400H60 * KBJ100-400H60 * KCD100 – 400H60; KCD/KCOD100 - 400H60 * KCP100 – 600H60; KCP/KCOP100 - 600H60	1,0 mm 1,0 mm 1,0 mm 1,2 mm 1,5 mm
Acceptable perforation of cable tray	15 ± 5% Does not apply for cable trays KB...	
Connecting the cable trays		
For sheet thickness up to and including 1,2 mm, slip-in method of fastening with the use of screws M6		
For sheet thickness 1,5 mm, fastening with the use connectors, joint protection plate and screws M6		
Connector type	LPPH60; LPP/LPOPH60N LPLPH60	
Type of joint protection plate in relation to the cable tray width	BL100 – 600; BL/BLO100 -600N	
Type of connecting screw	Bolts: SGNM6x12 or SGK6x12, class .5.8 4 pcs. for a coupler LPPH60N or LPP/LPOPH60N 4 pcs. for a coupler LPLPH60N 4 - 8 pcs. for a sheet plate BL100 – 600 or BL/BLO100 - 600N	
CABLE TRAY FASTENING STRUCTURE		
Max. spacing of supports	1,2 mb; 1,5 mb.*	
Fastening method	Fastening acc. to the drawings –Table 8 and 9	
Number of cable route levels with a single structure	3 pcs.	
Max. number of cable route levels at a single construction	3 levels, 4 levels for construction no:29, Table.9	
Max. width or total width of cable trays with a single level of support	600 mm*	
Cable route location	Location of the cable route shall be designed/ installed to avoid negative interaction with any other elements of the building or equipment which can cause damage of cable tray	
Type of foundation	Concrete of class min. B20, or any other foundation with required fire resistance	
Fastening to foundation: - concrete, grooved concrete - natural stone,solid brick - channel brick, channel concrete - SILKA brick, Porotherm - aerated concrete	Śruby rozporowe PSR..., PSROM..., SRO..., SRBO..., PSRZ..., STS..., STR..., SKT..., Śruby do betonu SBO..., SBSO... Kołki MKR... Tuleja rozporowa TRSO..., TRSK..., KSKO... Kotwy chemiczne PGS..., AS, ZI300 Pręty gwintowane PGM...	
Fastening to the steel support	Clip ZK... Threaded rod PGM... Clamping grip UDC Channel section CWP/CWOP... for constructions no: 16, 17, 18, 20, 21 tab.9	
Fastening to the trapezoidal plate	Trapezoidal suspension member WT... Threaded rod PGM... Suspension member pin of the rod PGM... for constructions no: 19 tab.9	
fastening to the support with raised floor	Pipe clip OBR... Support channel CWP40H40, CWP/CWOP40H40 For Cable Connection and Fastening Systems described in report of FIRES FR-005-13-AUNE (konstrukcja 3, 6) , FIRES FR-183-13-AUNE (konstrukcja 5, 6)	
Max. load of drop-in anchor and pins in E-30, E-60 systems	9 N/mm <sup>2</sup> przekroju śruby (pręta) – Dla rozwiązań normatywnych. Dla ponadnormatywnych obciążenie zgodne z wynikami badań	
Max. load of drop-in anchor and pins in E-90 system	6 N/mm <sup>2</sup> przekroju śruby (pręta)- Dla rozwiązań normatywnych. Dla ponadnormatywnych obciążenie zoodne z wynikami badań	

Table 5

BASIC PARAMETERS OF CABLE LADDER FASTENING – galvanized steel or stainless steel		
PARAMETER'S NAME	PARAMETER'S VALUE	
	Symbol	Sheet thickness
Cable ladder type	DGOD100 - 400H60 *	1,2 mm
	DUD100 – 400H60 *	1,2 mm
	DUP100-	1,5 mm
	400H60,DUP/DUOP100-400H60 *	1,5 mm

**BASIC PARAMETERS OF CABLE LADDER FASTENING**  
**– galvanized steel or stainless steel**

	DGOP100 - 600H60 DSH100 – 400H80 (sprawozdanie FIRES- FR-079-13-AUNE2)	
Max. spacing of rungs	150mm; 300 mm*	
CONNECTING THE CABLE LADDERS		
Type of connector	LDCH60N, LDC/LDOCH60N	
Type of connecting screw	Screw sets: SGNM8x14 or SGKM8x14, class.5.8 – 4 pcs. for a single connector LDCH60N lub LDC/LDOCH60N	
FASTENING CONSTRUCTION WITH CABLE LADDERS HORIZONTALLY		
Max. cable ladder load	20 kg/rm 25 kg/rm*	
Max. spacing of supports	1,2 rm.; 1,5 rm*	
Max. width or total width of cable ladders with a single level of support	600 mm*	
Fastening of cable ladder to the ceiling bracket or to the channel	Beam clamp ZM or ZM/ZMO – 1 pcs. for width 100 mm – 2 pcs. for width 200 – 600 mm	
Number of cable rout levels with a single support	3 levels, 4 levels for constructions no:26, Table.10	
Cable routes location	Location of the cable route shall be designed/ installed to avoid interaction with any other elements of the building or equipment, e.g. no other installations or cable routes are allowed above the cable connection and fastening system without a confirmed fire protection function.	
Type of foundation	Concrete of class min. B20/C25, or any other foundation with required fire resistance	
Fastening to the foundation: - concrete, grooved concrete - natural stone, solid brick - channel brick, channel concrete - SILKA brick, Porotherm - aerated concrete	Śruby rozporowe PSR..., PSROM..., SRO..., SRBO..., PSRZ..., STS..., STR..., SKT..., Śruby do betonu SBO..., SBSO... Kołki MKR... Tuleja rozporowa TRSO..., TRSK..., KSKO... Kotwy chemiczne PGS..., AS, ZI300 Pręty gwintowane PGM...	
Fastening to the steel support	Clip ZK... Threaded rod PGM... Uchwyt dociskowy UDC Channel section CWP; CWP/CWOP... for constructions no:13, 14, 15, 17, 18 tab.10	
Fastening to the trapezoidal plate	Trapezoidal suspension member WT... Threaded rod PGM...; Suspension member pin of the rod PGM8 for constructions no:16 tab.10	
Fastening to the support with raised floor	Tube Clamp OBR... Channel section- reinforced CWP40H40, CWP/CWOP40H40 For cable constructions described in a Report by FIRES FR-005-13-AUNE (construction 4, 7), FIRES FR-183-13-AUNE (construction 7,8)	
FASTENING OF CABLE LADDERS VERTICALLY		
Type of clamp	UTM, UTM/UTMO, UT	
Max. cable ladder load	20 kg/mb, 25 kg/mb*	
Max. spacing of clamps	1,2 rm.; 1,5 rm.*	
Fastening of clamp to the cable ladder	Bolts: SGNM8x14 or SGKM8x14, class.5.8 - 1 pcs. for single Grip UTM or UTM/UTMO - 1 pcs. for single Grip UT	
Fastening to the foundation: - concrete, grooved concrete - natural stone, solid brick - channel brick, channel concrete - SILKA brick, Porotherm - aerated concrete - construction of plasterboard material	Expansion bolts PSR..., PSROM..., SRO..., SRBO..., PSRZ..., STS..., STR..., SKT..., Concrete bolts SBO..., SBSO... Pinsi MKR... Expansion sleeve TRSO..., TRSK..., KSKO... Chemical anchors PGS..., AS, ZI300 Threaded rods PGM...	
Fastening to the foundation: - concrete - aerated concrete , silicate - channel brick, channel concrete - construction of plasterboard material	Pins PSR/PSROM... Bolt- expasion sleeve type STR M... Anchor KSKO...` Fastened with bolts or with use of rod PGM8 through carrying steel construction	
The cables fastened on a cable ladder	Fastening the cables max. every 600 mm* , with the use of Grips UKO1...-max. number of cables for a single Grip UKO1...-3 pcs. or 5 pcs.. for the	

**BASIC PARAMETERS OF CABLE LADDER FASTENING**  
**– galvanized steel or stainless steel**

	diameter of 20 mm UKO2...- max. number of cables for a single Grip UKO2...-3 pcs. or 5 pcs., for the diameter of 20 mm
Max. load for the bolts, threaded rods, sleeves and pins, in the E-30, E-60 system	9 N/mm <sup>2</sup> of a cross-section of the screw or a rod- applies for the standard solutions. For solutions in excess of the standard the load values are as per the test results
Max. load for the bolts, threaded rods, sleeves and pins, in the E-90 system	6 N/mm <sup>2</sup> of a cross-section of the screw or a rod- applies for the standard solutions. For solutions in excess of the standard the load values are as per the test results

\* - badania ponadnormatywne

Table 6

**CABLE CLIPS – BASIC PARAMETERS OF CABLE FASTENING TO THE WALL OR TO THE CEILING,**  
**in E-30, E60, E-90 systems.**

**– galvanized steel or stainless steel**

PARAMETER'S NAME	PARAMETER'S VALUE
Types of clip	UDF..., UDFB... UEF..., UEFB... KSA...
Cable diameter acceptable for fastening with the use of clips	Diameter: from Ø5mm to Ø42mm, for: UDF..., UDFB..., UEF..., UEFB...; Diameter: from Ø5mm to Ø55mm, for: KSA...
Max. spacing of clips	300 mm, 600 mm*
Fastening to the foundation: concrete, grooved concrete - natural stone, solid brick - channel brick, channel concrete - SILKA brick, Porotherm - sheet plate, trapezoidal sheet plate - steel construction elements	Pins SR0M... Pins SRB0M... Expansion bolt PSR0M... Sleeve TRS0M... + Threaded rod PGM... Expansion anchor GSO... Anchor-nail type KWBO... Concrete bolt SBO M... Bolt-expansion sleeve type STR M... Steel expansion pin MKR... Anchor for plasterboard material KKG... Anchor KSKO...
Fastening to the steel construction	Grip ZK..., ZSU3 Clamping Grip UDC Self drilling screw SMD ... Powder-actuated fastener GWT...
<b>CABLE CLIPS</b>	
Type of cable clip	OZ, OZ/OZO OZS, OZS/OZSO OZM, OZM/OZMO
Max. load	OZ, OZ/OZO – 6kg/m OZS, OZS/OZSO – 2kg/m OZM, OZM/OZMO – 1kg/m
Max. spacing of cable clips	600 mm*
Fastening to the foundation: - concrete, natural stone, solid brick - aerated concrete, silicate - channel brick, channel concrete - plaster-cardboard - channel brick, channel concrete - SILKA brick, Porotherm, - sheet plate, trapezoidal sheet plate - steel construction elements	Pins SR0M... Pins SRB0M... Expansion bolt PSR0M... Sleeve TRS0M... + Threaded rod PGM... Expansion anchor GSO... Anchor-nail type KWBO... Concrete bolt SBO M... Bolt-expansion sleeve type STR M... Steel expansion pin MKR... Anchor for plasterboard material KKG... Anchor KSKO...
Fastening to the steel construction	Grip ZK... Clamping Grip UDC ... Self drilling screw SMD ...
<b>FASTENING WITH CABLE LADDER RUNG</b>	

Type of rung	SDP..., SDP/SDOP..., SDC..., SDC/SDOC...
Length of rung	Length from 100mm to 1000mm, acc. to the catalogue of BAKS
Max. spacing of rungs	600 mm*
Max. spacing of pins for the rung fastening	250 mm
Fastening of cables to the rung	Fastening of cables max. every 600 mm*, with the use of cable clamp UKO1...-max. number of cables in 1 pcs of cable clamp UKO1...-3pcs. or 5pcs. for Ø 20 mm UKO2...-max. number of cables in 1 pcs of cable clamp UKO2...-3pcs. or 5pcs. for Ø 20 mm
Fastening to the foundation: - concrete, natural stone, solid brick - aerated concrete, silicate - channel brick, channel concrete - SILKA brick, Porotherm, - sheet plate, trapezoidal sheet plate - steel construction elements	Pins SROM... Pins SRBOM... Expansion sleeve PSROM... Expansion anchor bolt GSO... Nail anchor KWBO... Concrete bolt SBO M... Expansion sleeve bolt STR M... Steel expansion pin MKR... Anchor KSKO...

Table 7

BASIC PARAMETERS OF WIRE MESH CABLE TRAY FASTENING - steel wire, galvanized or made of stainless steel	
PARAMETER'S NAME	PARAMETER'S VALUE
	<b>Steel rod -galvanized</b>
Wire mesh cable tray types	KDS60-600H60, KDS/KDSO60-600H60 KSG60-600H60 KDSZ100-400H60 KGS60-100H60
Diameter of wire	Ø 4 – 5 mm
CONNECTING WIRE MESH CABLE TRAYS	
Type of connector	Joint connector USSN, USS N/USSO Joint connector USSPW, USSPW/USSPWO Joint connector USSW, USSW/USSWO*
WIRE MESH CABLE TRAYS FASTENING STRUCTURE	
Max. load of the mesh tray	20kg/rm. – KDS100-600H60, KDS/KDSO100-600H60, KSG100-600H60, KDSZ100-400H60 2kg/rm. – KDS60H60, KDS/KDSO60H60, KSG60H60 5kg/rm. – KGS60-100H60
Max. width of mesh trays jointly at a single level of construction	600 mm
Fastening to the mesh tray	- Clip ZS, ZS/ZSO - Suspension member WKS60, WKS/WKS060 - Clip ZSW - Screw grip USSPW, USSPW/USSPWO - Assembly profile PMC, PMC/PMCO
Fastening to the foundation: - Beton, Beton zarysowany - Kamień, Cegła pełna - Cegła kanałowa, beton kanałowy - cegła SILKA, Porotherm - Gazobeton	Expansion sleeve PSR..., PSROM..., SRO..., SRBO..., PSRZ..., STS..., STR..., SKT..., Concrete bolt SBO..., SBSO... Pin MKR... Expansion sleeve TRSO..., TRSK..., KSKO... Chemical anchors PGS..., AS, ZI300 Threaded rod PGM...
Fastening to the steel support	Clip ZK... Threaded rod PGM... Clamping grip UDC Channel bar CWP; CWP/CWOP... for constructions no: R3, T15, T16, T17 tab.11
Fastening to the trapezoidal plate	Trapezoidal suspension member WT... Threaded rod PGM...; Suspension member pin of the rod PGM... for constructions no: R4, T18 tab.11
Fastening to the support with raised floor	Pipe clip OBR... Support channel CWP/CWOP40H40 For cable constructions described in a Report by FIRES FR-005-13-AUNE (construction 5, 8).
Fastening of cables to the wire mesh cable trays	Fastening of cables max. every 600 mm*, with the use of grips: UKZ1/UKZO1...-max. number of cables in a single grip 3pcs. or 5pcs. diameter< 20mm UKZ2/UKZO2...- number of cables in a single grip 3pcs. or 5pcs., diameter< 20mm
WIRE MESH CABLE TRAYS- STRENGTH PARAMETERS	

BASIC PARAMETERS OF WIRE MESH CABLE TRAY FASTENING - steel wire, galvanized or made of stainless steel	
Max. spacing of supports	1,5 m.
Max. cable tray load	20 kg/ m 5 kg/ m *** 2 kg/ m **
Type of foundation	Concrete of class min. B20/C25, or any other foundation with required fire resistance
Cable route location	Location of the cable route shall be designed/ installed to avoid interaction with any other elements of the building or equipment, e.g. no other installations or cable routes are allowed above the cable connection and fastening system without a comparable fire protection function
Number of cable route levels with a single support	3 pcs.
Max. load of Drop-in anchors and pins in E-30, E-60 systems	9 N/mm <sup>2</sup> for cross-section of the screw (rod) – for the standard solutions. For solutions in excess of the standard the load according to the test results
Max. load of Drop-in anchors and pins in E-90 system	6 N/mm <sup>2</sup> for cross-section of the screw (rod) - for the standard solutions For solutions in excess of the standard the load according to the test results

\* - in excess of the standard testing

\*\* - refers to the cable tray KDSO60H60/3

\*\*\* - refers to the cable tray KGS...

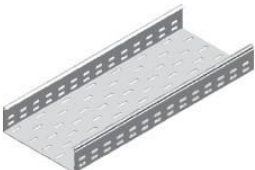
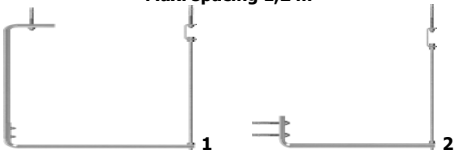
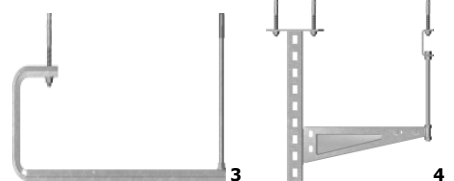
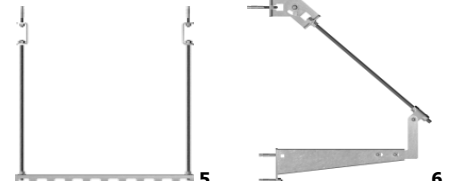
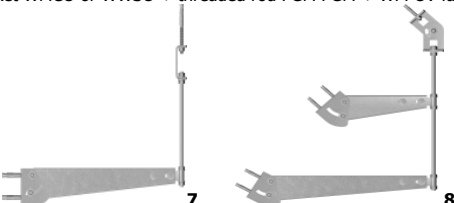
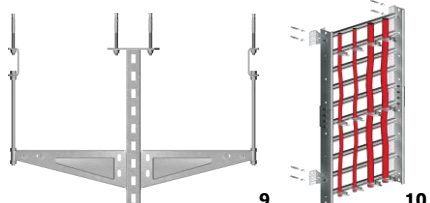
Methods of configuration and the options of installation of the **Standard Cable Connection and Fastening Systems** – see the drawings in Table 8.





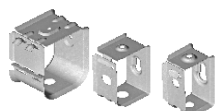
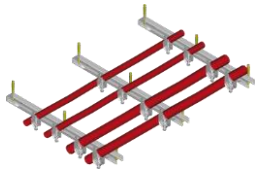



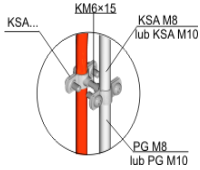
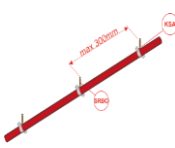
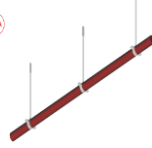
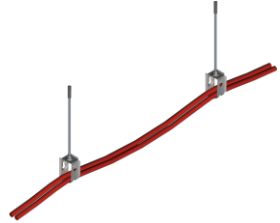

### The Standard Cable Connection and Fastening Systems, class E30, E60 or E90 (Classification E, acc. to DIN 4102-12 – see Table 13)

.....  
<sup>2</sup> Point 7.3.3.3 of the DIN 4102-12:1998 standard, provides the definition of configuration with a standard support structure.



Table 8








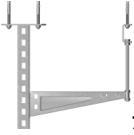
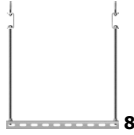

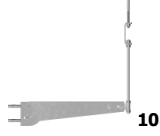

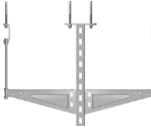

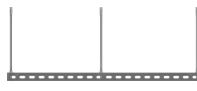
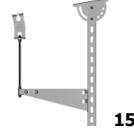
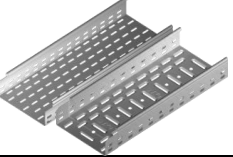


Support elements	Support structures and their descriptions (detailed description in the catalogue of BAKS)
<p><b>A</b></p> <p><b>KCP/KCOP...H60</b> Cable tray - sheet thickness 1,5mm, - max. width 300mm - fastening horizontally</p> 	<p>Max. spacing 1,2 m</p>  <p>1. Bracket 2 x WFLO + threaded rod PGM 2. Bracket WFLO + threaded rod PGM</p>  <p>3. Bracket WFCO + PGM 4. Bracket WPCO or WPCB + Bracket WWSO or WMCO threaded rod PGM</p>  <p>5. Channel CWOP + 2 x PGM 6. Bracket WMCO or WWSO + threaded rod PGM PGM + WPPOV lub WKPO</p>  <p>7. Variable bracket WUO + threaded rod PGM 8. Variable bracket 2 x WUO + threaded rod PGM + WPPOV</p>  <p>9. Bracket WPCO or WPCB + Bracket WWSO or WMCO + threaded rod PGM 10. Cable ladder + 2 pcs. of fastening bracket UT or UTMO (fastening horizontally)</p>



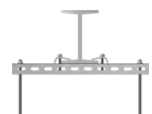
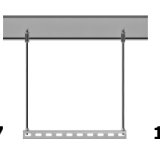




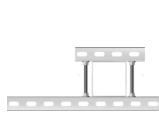
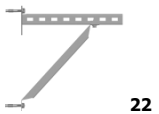

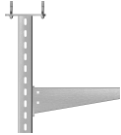
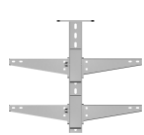
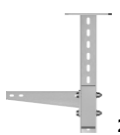
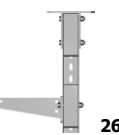
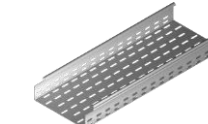

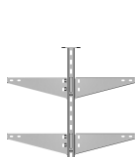

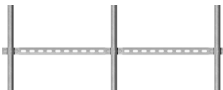
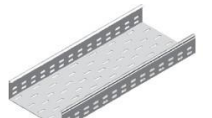


Support elements	Support structures and their descriptions (detailed description in the catalogue of BAKS)
<p><b>B</b> <b>Fastening to the wall or to the ceiling</b></p> <p>Rung+ cable clip <b>SD/SDO</b> + <b>UK/UKO</b></p>  <p>Cable clip - <b>UDF</b></p>  <p>Cable clip - <b>UEF</b></p>  <p>Cable clip - <b>KSA</b></p>  <p>Cable clips <b>OZ/OZO; OZS/OZSO;</b> <b>OZM/OZMO</b></p> 	<p><b>Max. spacing 0,3 m</b></p>      <p>KSA... KM6x15 KSA M8 lub KSA M10</p> <p>max 300mm</p>    

The methods and options of installation of the **In Excess of the Standard Cable Connection and Fastening Systems of BAKS**— see the drawings below, in Tables 9, 10, 11, 12.

**Cable trays – The In Excess of the Standard Class E30, E60 or E90**  
**(Classification E, see Table 13)**



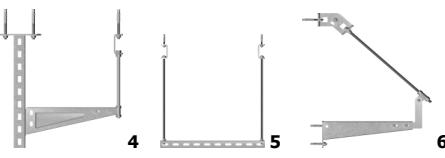

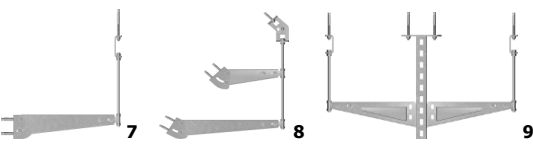

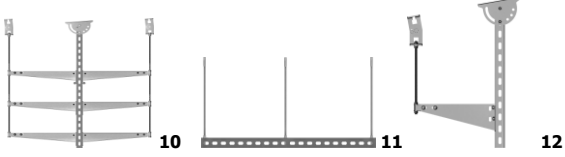
Table 9

Carrying elements of the cable	Carrying constructions and their descriptions (detailed description in the catalogue of BAKS)
<p align="center"><b>C</b></p> <p><b>KGL/KCL/KPL50H60</b> - sheet plate thickness: 0,7mm, max. load: 5 kg/m</p> <p><b>CWP/CWOP40H40</b> - sheet plate thickness 1,5mm, max. load: 5 kg/m</p> 	<p align="center"><b>Max. spacing 1,5m</b></p>    <p>1. Clip ZSW + threaded rod PGM (max. cable tray width 100mm, max load of the cables 10kg/m)  2. Suspension member WC (only for the cable trays of 50mm width).  3. Threaded rod (only for the channel sections CWP/CWOP40H40).</p>    <p>4. Pipe type bracket 2 x WFLO + rod PGM  5. Pipe type bracket WFLO + rod PGM  6. Pipe type bracket WFCO + rod PGM</p>    <p>7. Bracket WPCB or WPCB + Extension arm WWSO or WMCO + rod PGM  8. Channel bar CWP or CWOP + 2 pcs. of rod PGM  9. Extension arm WWSO or WMCO + rod PGM + suspension member WPPOV or WKPO</p>    <p>10. Extension arm- adjustable WUO + rod PGM  11. Extension arm- adjustable 2 x WUO + rod PGM + Suspension member WPPOV  12. Bracket WPCO or WPCB + 2 pcs. of Extension arm WWSO or WMCO + rod PGM</p>    <p>13. Mounting plate PSUNO + Channel section CWOP + 6 pcs. of Extension arm WWSO or WMCO + rods PGM (max load of construction: 150kg)  14. Channel section CWP or CWOP + 3 pcs. of rod PGM  15. Mounting plate PSUNO + Channel section CWOP + Extension arm WWSO or WMCO + rod PGM</p>
<p align="center"><b>D</b></p> <p><b>KCL/KCOL...H60</b> <b>KGL/KGOL...H60</b> - sheet plate thickness 0,7mm, max. width: 300mm, max. load. 20 kg/m</p> 	
<p align="center"><b>E</b></p> <p><b>KFL...H60</b> - sheet plate thickness 0,7mm, max. width: 300mm, max. load. 15 kg/m</p> 	
<p align="center"><b>F</b></p> <p><b>KBL...H60</b> - sheet plate thickness 0,7mm, max. width. 300mm, max. load: 20 kg/m</p> 	
<p align="center"><b>G</b></p> <p><b>KBL...H50</b> - sheet plate thickness 0,7mm, max. width. 300mm, max. load: 20 kg/m</p>	

	   
<p><b>H</b></p> <p><b>KCJ/KCOJ...H60</b> <b>KGJ/KGOJ...H60</b></p> <p>- sheet plate thickness 1,0mm, max. width:400mm, max. load:20kg/m</p> 	<p><b>16.</b> Channel section CWP or CWOP + 2 pcs. of Grip UDC (max. load of the cables: 10kg/m)</p> <p><b>17.</b> Channel section CWP or CWOP + 2 pcs. of Grip UDC + rods PGM (max. load of the cables: 10kg/m)</p> <p><b>18.</b> 2 pcs. of Grip ZK + 2 pcs. of rod PGM + Channel section CWP or CWOP (max. load of the cables: 10kg/m)</p> <p><b>19.</b> 2 pcs. of trapezoidal suspension member WT/WTO + 2 pcs. of rod PGM + Channel section CWP or CWOP (max. load of the cables:10kg/m)</p>
<p><b>I</b></p> <p><b>KFJ...H60</b></p> <p>- sheet plate thickness 1mm, max. width: 400mm, max. load: 15 kg/m</p> 	   <p><b>20.</b> Channel section CWP or CWOP + rods PGM (max. load of cables 10kg/m)</p> <p><b>21.</b> Channel section CWP or CWOP + rods PGM (max. cable tray width 200mm; max. load of the cables: 10kg/m)</p> <p><b>22.</b> Extension arm WPTKO (complete set)</p>
<p><b>J</b></p> <p><b>KBJ...H60</b></p> <p>- sheet plate thickness 1mm, max. width: 400mm, max. load: 20kg/m</p> 	    <p><b>23.</b> Bracket WPCEO + Extension arm WWCTO</p> <p><b>24.</b> Bracket WPCEO + 4 pcs. of Extension arm WWCTO (max load of the cables: 120kg)</p> <p><b>25.</b> Bracket WPCEO + Extension arm WMCO (max load of the cables:10kg/m)</p> <p><b>26.</b> Mounting plate PSEN + Channel section CT70H50 + Extension arm WWCTO + expansion plate BR70</p>
<p><b>K</b></p> <p><b>KCD/KCOD...H60</b></p> <p>- sheet plate thickness 1,2mm, max. width: 400mm, max. load: 10 kg/m</p> 	    <p><b>27.</b> Bracket WPCO or WPCB + 6 pcs. of Extension arm WMCO or WWSO (max load of Extension arm: 15kg; max lenght of Extension arm:200mm)</p> <p><b>28.</b> Bracket WPCO or WPCB + 4 pcs. of Extension arm WMCO or WWSO + expansion plate BR40(max load of a single Extension arm 15kg; max lenght of Extension arms 300mm)</p> <p><b>29.</b> Channel section CWOP + Extension arms WMCO or WWSO + rod PGM + Grip UPWO or UPWKO + Suspension member WPPOV or WKPO</p> <p><b>30.</b> Clamps OBR + Channel section CWOP (configuration fastened to the construction with elevated floor)</p>
<p><b>L</b></p> <p><b>KCP/KCOP...H60</b></p> <p>- sheet plate thickness 1,5mm, max. width: 600mm, max. load: 20 kg/m</p> 	  <p><b>31.</b> Extension arm WPTO (max lenght of Extension arm WPTO: 100, max load of the cables: 10kg/m); Extension arm WWCH (installation to an I-bar).</p>

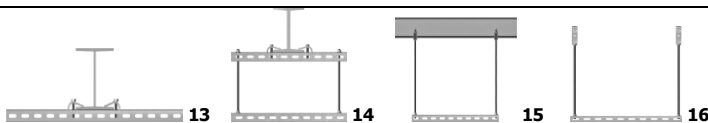
**Cable ladders - The In Excess of the Standard Class E30, E60 or E90**  
(Classification E, see Table 13)

Table 10

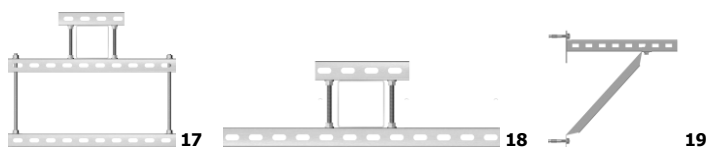
Elementy nośne kabla	Carrying constructions and their description (detailed description in the catalogue of BAKS)
<p><b>M</b></p> <p><b>DUD...H60</b></p> <ul style="list-style-type: none"> <li>- sheet plate thickness: 1,2mm,</li> <li>- max. width: 400mm,</li> <li>- max. load: 20 kg/m</li> </ul> 	<p><b>Max. spacing 1,5 m</b></p>  <ol style="list-style-type: none"> <li>1. Pipe type bracket 2 x WFLO + rod PGM</li> <li>2. Pipe type bracket WFLO + rod PGM</li> <li>3. Pipe type bracket WFCO + rod PGM</li> </ol>  <ol style="list-style-type: none"> <li>4. Bracket WPCO +Extension arm WWSO or WMCO + rod PGM</li> <li>5. Channel section CWP or CWOP + 2 pcs. of rod PGM</li> <li>6. Extension arm WMCO +rod PGM</li> </ol>
<p><b>N</b></p> <p><b>DGOD...H60</b></p> <ul style="list-style-type: none"> <li>- sheet plate thickness 1,2mm,</li> <li>- max. width 400mm,</li> <li>- max. load:. 20 kg/m</li> </ul> 	 <ol style="list-style-type: none"> <li>7. Extension arm- adjustable WUO + rod PGM</li> <li>8. Extension arm- adjustable 2 x WUO + rod PGM</li> <li>9. Bracket WPCO +2 pcs. of Extension arm WWSO or WMCO +rod PGM</li> </ol>
<p><b>O</b></p> <p><b>DUP/DUOP...H60</b></p> <ul style="list-style-type: none"> <li>- sheet plate thickness 1,5mm,</li> <li>- max. width. 400mm,</li> <li>- max. load:. 25 kg/m</li> </ul> 	 <ol style="list-style-type: none"> <li>10. Mounting plate PSUNO + Channel section CWOP + 6 pcs. of Extension arm WWSO or WMCO + rods PGM (max. load of construction:150kg)</li> <li>11. Channel section CWP, CWOP + 3 pcs. of rod PGM (max. load of construction: 60kg)</li> <li>12. Mounting plate PSUNO + Channel section CWOP + Extension arm WWSO or WMCO + rod PGM</li> </ol>

**P****DGOP...H60**

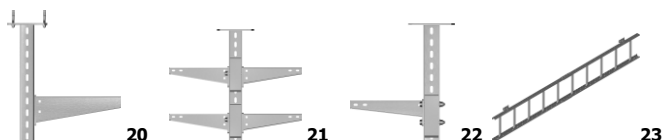
- sheet plate thickness: 1,5mm,
- max. width: 600mm,
- max. load: 20 kg/m



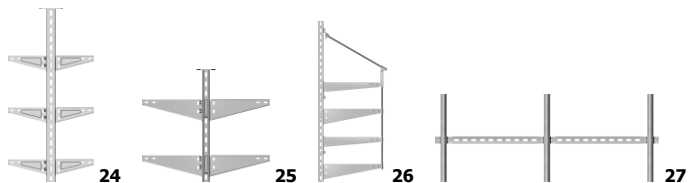
- 13.** Channel section CWOP + 2 pcs. of rod UDC  
**14.** Grips UDC + Channel sections CWOP + rods PGM (max.load of the cables 10kg/m)  
**15.** 2 pcs. of Clip ZK + 2 pcs. of rod PGM + Channel section CWP, CWOP (max. spacing of supports: 1,2m; max.load of the cables 10kg/m)  
**16.** Trapezoidal suspension member WT/WTO + rods PGM + Channel section CWP, CWOP



- 17.** Channel sections CWP or CWOP + rods PGM (max.load of the cables 10kg/m)  
**18.** Channel sections CWP lor CWOP + rods PGM (max cable tray width: 200mm; max.load of the cables 10kg/m)  
**19.** Extension arm WPTKO (complete set)

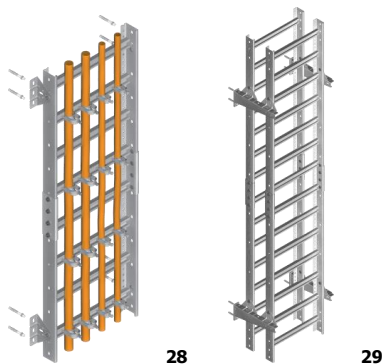


- 20.** Bracket WPCEO + Extension arm WWCTO  
**21.** Bracket WPCEO + 4 pcs. of Extension arm WWCTO (max load of construction: 120kg)  
**22.** Bracket WPCEO + Extension arm WMCO (max load of the cables 10kg/m)  
**23.** Cable ladder + triangle grips UT or UTMO (fastening flat to the wall)



- 24.** Bracket WPCO or WPCB + 6 pcs. of Extension arm WMCO or WWSO (max load for a single Extension arm 15kg; max length of Extension arms 200mm)  
**25.** Bracket WPCO or WPCB + 4 pcs. of Extension arm WMCO or WWSO + expansion plate BR40 (max load for a single Extension arm: 15kg; max length of Extension arms: 300mm)  
**26.** Channel section CWOP + Extension arms WMCO or WWSO + rod PGM + Grip

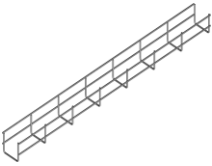
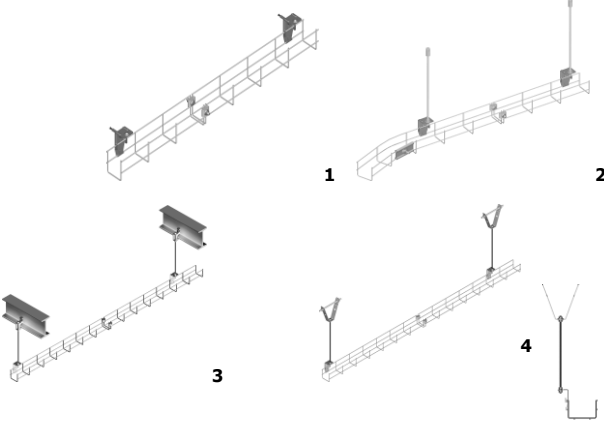
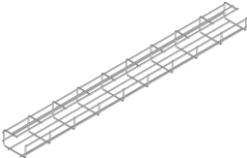
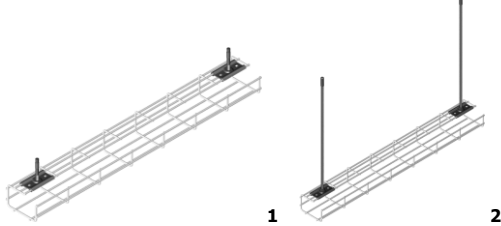
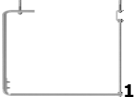
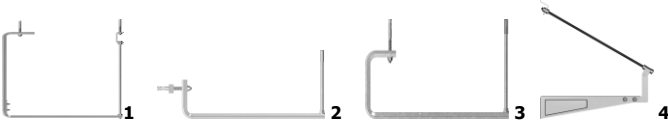
- UPWO or UPWKO + suspension member WPPOV or WKPO
- 27.** Clamps OBR + Channel section CWOP (configuration fastened to the construction with elevated floor)



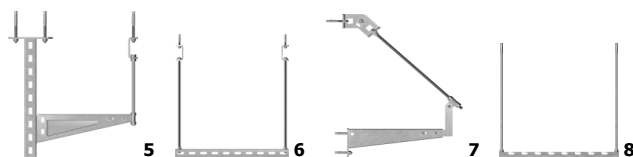
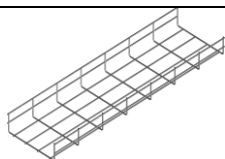
- 28.** Cable ladder + 2 pcs. of grip UT or UTMO (fastening vertically)  
2 x cable ladder + extension armsWMC/WMCO + grips UT or UTMO (fastening vertically)

**Mesh trays – Cable Sets In Excess of the Standard, Class E30, E60 or E90  
(Classification E- see Table 13)**

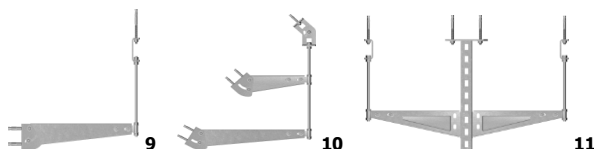
Table 11

Carrying elements of the cable	Carrying constructions and their description (detailed description in the catalogue of BAKS)
<p><b>R</b></p> <p><b>KDS/KDSO60H60 KSG60H60</b></p> <p>Parameters:</p> <ul style="list-style-type: none"> <li>- width: 60 mm</li> <li>- max. load: 2 kg/m</li> <li>- max. spacing of supports 1,5m</li> </ul> 	<p align="center"><b>Max. spacing 1,5 m</b></p>  <ol style="list-style-type: none"> <li>1. Suspension member WKS060</li> <li>2. Suspension member WKS060 + rod PGM6</li> <li>3. Clip ZK + rod PGM6 + suspension member WKS060</li> <li>4. Trapezoidal suspension member WT/WTO + rod PGM6 + suspension member WKS060</li> </ol>
<p><b>S</b></p> <p><b>KGS...H60</b></p> <p>Parameters:</p> <ul style="list-style-type: none"> <li>- width: 60 – 100mm</li> <li>- max. load: 5 kg/m</li> <li>- max. spacing of supports 1,5m</li> </ul> 	<p align="center"><b>Max. spacing 1,5 m</b></p>  <ol style="list-style-type: none"> <li>1. Grip USSPWO</li> <li>2. Gript USSPWO + rod PGM6</li> </ol>
<p><b>I</b></p> <p><b>KDS/KDSO...H60 KSG...H60</b></p> <p>Parameters:</p> <ul style="list-style-type: none"> <li>- width: 100 - 600mm</li> <li>- max. load: 20 kg/m</li> <li>- max. spacing of supports 1,5m</li> </ul> 	<p align="center"><b>Max. spacing 1,5 m</b></p>  <ol style="list-style-type: none"> <li>1. Pipe type bracket 2 x WFLO + rod PGM</li> <li>2. Pipe type bracket WFLO + rod PGM</li> <li>3. Pipe type bracket WFCO + rod PGM</li> <li>4. Extension arm WW + rod PGM</li> </ol>





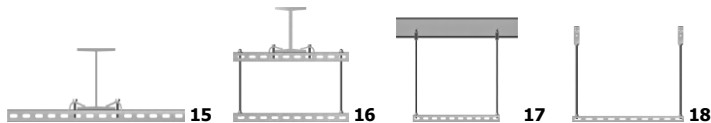
5. Bracket WPCO + Extension arm WWSO lub WMCO + rod PGM
6. Channel section CWOP + 2 pcs. of rod PGM
7. Extension arm WMCO + rod PGM
8. Assembly profile PMCO + 2 pcs. of rod PGM



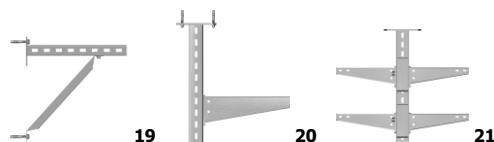
9. Extension arm - adjustable WUO + rod PGM
10. Extension arm - adjustable 2 x WUO + rod PGM
11. Bracket WPCO + 2 pcs. of Extension arm WWSO or WMCO + rod PGM



12. Mounting plate PSUNO + Channel section CWOP + 6 pcs. of Extension arm WWSO or WMCO + rods PGM (max. load of construction: 150kg)
13. Channel section CWOP + 3 pcs. of rods PGM (max. load of construction 60kg)
14. Mounting plate PSUNO + Channel section CWOP + Extension arm WWSO or WMCO + rod PGM



15. Channel section CWOP + 2 pcs. of Grip UDC
16. Grips UDC + Channel sections CWOP + rods PGM (max. load of cables 10kg/m)
17. 2 pcs. of Clips ZK + 2 pcs. of rods PGM + Channel section CWOP (max. spacing of supports: 1,2m; max. load of cables: 10kg/m)
18. Trapezoidal suspension members WT/WTO + rods PGM + Channel section CWOP



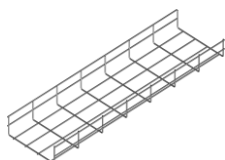
19. Extension arm WPTKO (complete set)
20. Bracket WPCEO + Extension arm WWCTO
21. Bracket WPCEO + 4 pcs. of Extension arm WWCTO (max load of construction: 120 kg)


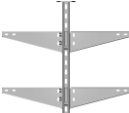



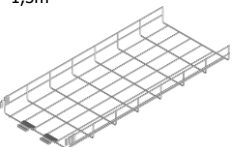
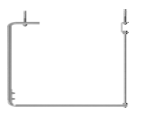
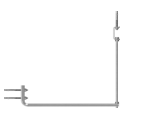
## I

### KDS/KDSO...H60 KSG...H60

#### Parameters::


- width: 100 - 600mm
- max. load: 20 kg/m
- max. spacing of supports 1,5m

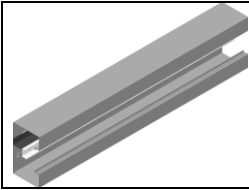


	   <p>22. Extension arm WPCO or WPCB + 6 pcs. of Extension arm WMCO or WWSO (max load for a single extension arm 15kg; max length of the extension arms 200mm)</p> <p>23. Extension arm WPCO lub WPCB + 4 pcs. of Extension arm WMCO or WWSO + expansion plate BR40 ((max load for a single extension arm 15kg; max length of the extension arms 300mm)</p> <p>24. Clamp OBR + channel section CWOP (configuration fastened to the construction with elevated floor)</p>   <p>25. Clamp ZSW + rod PGM</p> <p>26. Assembly profile PMCO – installation vertically (fastening of cables with use of grip UKZO)</p>
<p><b>U</b></p> <p><b>KDSZ ...H60</b></p> <p>Parameters:</p> <ul style="list-style-type: none"> <li>- width: 100 - 400mm</li> <li>- max. load: 20 kg/m</li> <li>- max. spacing of supports: 1,5m</li> </ul> 	<p><b>Max. spacing 1,5 m</b></p>   <p>1. Pipe-type bracket 2 x WFLO + rod PGM</p> <p>2. Pipe-type bracket WFLO + rod PGM</p>

**Cable clamps - The In Excess of the Standard Cable Connection and Fastening Systems, class E30, E60 or E90**  
**(Classification E, acc. to DIN 4102-12 – see Table 13)**



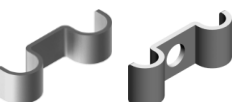


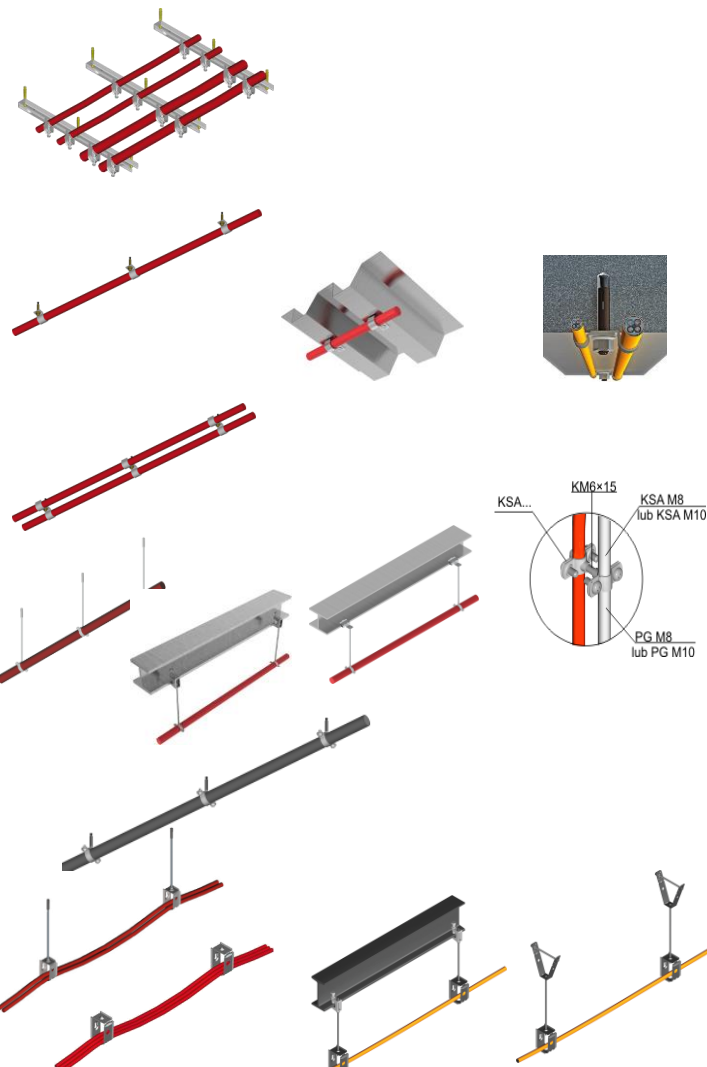
Table 12

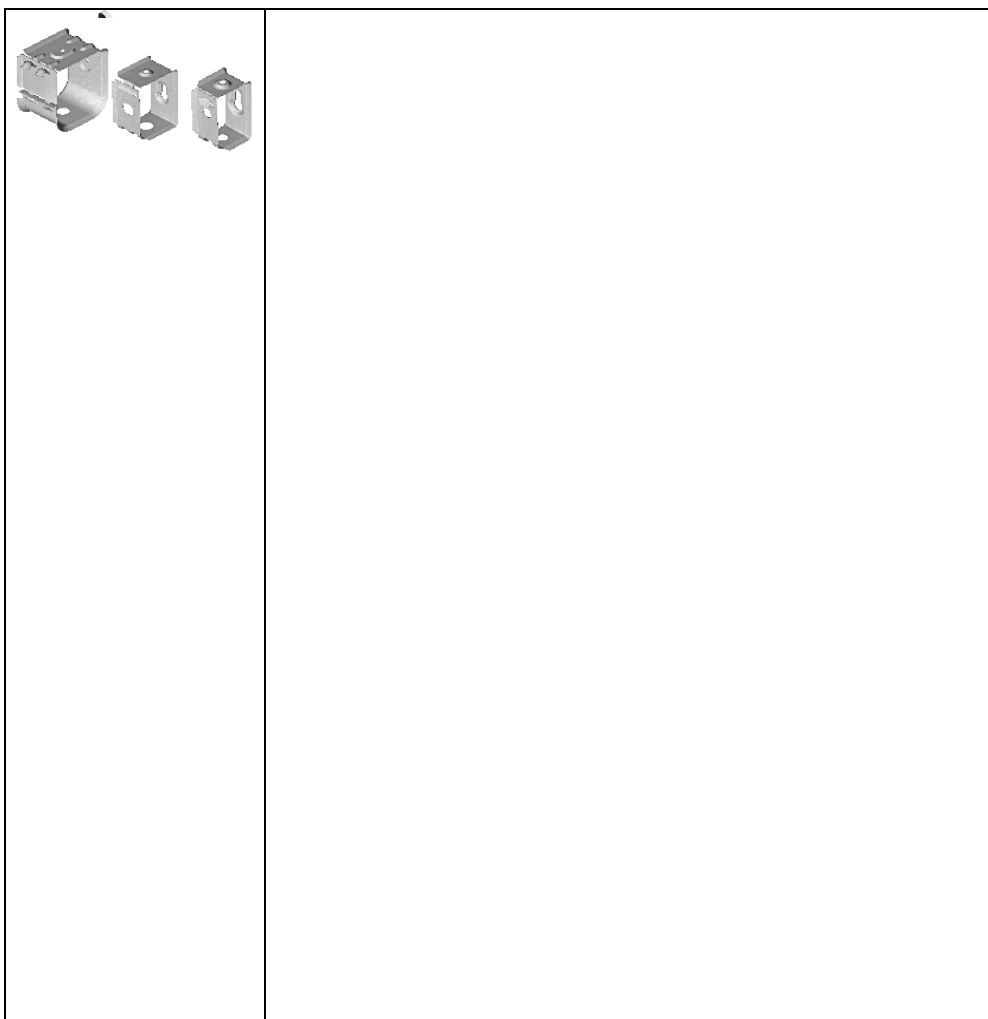
Carrying elements of the cable	Carrying constructions and their description (detailed description in the catalogue of BAKS)
<p><b>W</b></p> <p><b>KS...H68</b></p> <p>Parameters:</p> <ul style="list-style-type: none"> <li>- width. 115 - 170mm</li> <li>- fastening every 0,8m</li> </ul>	



**Cable grips – The In Excess of the Standard Cable Sets, Class E30, E60 lub E90  
(Classification E – see Table 13)**

Table 12

Carrying elements of the cable	Carrying constructions and their descriptions (detailed description in the catalogue of BAKS)
<p><b>X</b></p> <p>Rung + grip - <b>SD/SDO+UK/UKO</b></p>  <p>Cable grip - <b>UDF / UDFB</b></p>  <p>Cable grip - <b>UEF / UEFB</b></p>  <p>Cable clamp - <b>KSA</b></p>  <p>Thin-walled tube - <b>RU + KSA</b>/or any other clamp of the required fire resistance rating (fastening to foundation max. every 1,5m)</p>  <p>Clamps <b>OZ/OZO; OZS/OZSO; OZM/OZMO</b></p>	<p><b>Max. spacing 0,6m</b></p> 



In Table 13 a classification of the **standard** arrangements has been identified (lines A and B), confirmed by the numerous test results according to DIN 4102-12, and classification of the special **in excess of the standard** arrangements (lines C,D,E,F,G,H,I,J,K,L,M,N,O,P,R,S,T,U,W,X).

**Tablica 13**

DÄTWYLER		BITNER			
X	E90	A	E90	1	NHXH=NHXH-J
T	E90	B	E90	2	NHXH E30 = NHXH-J E30
R	E90	D	E90	3	{N}HXH = {N}HXH-J
P	E90	F	E90	4	{N}HXH E30 = {N}HXH-J E30
O	E90	H	E90	5	NHXCH
L	E90	K	E90	6	{N}HXCH
K	E90	L	E90	7	NHXHRHX = NHXHRHX-J
B	E90	M	E90	8	N2XH
A	E90	N	E90	9	N2XH E30
		O	E90	10	N2XCH
		P	E90	11	N2XCH E30
		R	E90	12	JE-H(st)H
		T	E90	13	JE-H(st)H E30
		W	E90	14	JE-H(st)HRH
		X	E90	15	HDGs
				16	HDGsekw
				17	HTKSH
				18	HTKSHekw
				19	HLGs
				20	HLGsekw
				21	FLAME-X 950
				22	BITflame S
				23	BITflame S(St)
				24	BITflame AS
				25	BITflame AS(St)
				26	BITflame 1000
				27	BITflame 1000 C
				28	BITservo® FS
				29	BITservo® FS mika
				30	Securi Flame F
				31	PGI-H
				32	LINCH
				33	SSKFH-V180
				34	CSKH
				35	1-CXKH-V
				36	SHXKFH-V180

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
ELKOND	A	E90						E90					E90																						
	B	E90						E90					E90																						
	K	E90						E60					E60																						
	L	E90						E60					E60																						
	P	E90						E60					E90																						
ELPAR	R	E60						E60					E60																						
	T	E60						E60					E60																						
	X	E90						E90					E90																						
	A	E90		E90	E60	E90	E90								E90	E30	E30																		
	B	E90		E90			E90								E90																				
EUPEN	D			E30			E90																												
	H			E90			E90						E90																						
	L			E90			E90						E90																						
	P			E30			E30						E30																						
	X			E90			E90						E90																						
FACAB	A	E90				E90							E90			E90																			
	B	E90				E90							E90		E30																				
	X	E30				E60																													
	A	E90				E90							E90	E90																		E90			
	B	E90				E90							E90																						
KABLOTEK	D					E90							E90																						
	H	E90											E90																				E90		
	L	E90											E90	E30																					
	P	E90											E90	E30																					
	R	E60																																	
T	E60																																		
X	E90																																		

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
MADEX	A	E90				E90												E90	E90																	
	B	E90				E90												E90	E90																	
	D	E60				E90																														
	H	E90				E60													E30	E30																
	L	E90				E90													E30	E30																
	P	E60				E90													E30	E30																
	R	E90				E90													E60	E30																
	T	E90				E90													E60	E30																
	X	E90				E90													E90	E90																
NEXANS	A								E90	E30	E90	E30																								
	B								E90	E30	E90	E30																								
	X								E90	E60	E90	E30																								
NKT	A	E90	E30																																	
	B	E90	E60																																	
	D	E90																																		
	H	E90	E60																																	
	T	E90																																		
PRAKAB	X	E90	E60																																	
	A																																			E120
	B																																			E120
	D			E90																																E90
	G			E90																																E60
STUDER	H			E90																																E90
	T			E60																																E60
	X			E90																																E90
	A			E90																																
	B			E90																																
	H			E60																																
	L			E60																																
	O			E60																																
	P			E60																																
	X			E60																																

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	
TECHNOKABEL	A	E90		E90		E90	E90						E90			E90	E90	E90	E90	E90	E90															
	B	E90		E90			E90	E90					E90			E90	E90	E90	E90	E90	E90															
	D	E60		E90												E90		E60			E90															
	E			E90														E90																		
	F			E90																																
	H	E90		E90	E90	E90			E90							E90			E90	E90																
	I	E90			E90											E90																				
	J	E90		E90	E90	E90										E30																				
	K	E90						E90									E30	E90	E90																	
	L	E90		E90			E90	E90					E90			E90	E90	E90	E90	E90	E90	E90														
	M			E30																																
	N	E90				E90												E90	E90																	
	O	E90		E90			E90	E90	E90				E90			E90	E90	E90	E90	E90	E90	E90														
	P	E90		E90			E90	E90					E90			E90	E90	E90	E90	E90	E90	E90														
	R	E90		E90			E90	E90					E90			E90	E90	E90	E90	E90	E90	E90														
	S	E90		E30												E90	E90	E90	E90	E90	E90	E90														
	T	E90		E90	E90	E90	E90						E90			E90	E30	E90	E90	E90	E90	E90														
	U			E90														E30																		
V	E90														E90			E90	E90																	
X	E90		E90	E90	E90	E90	E90	E90				E90			E90	E90	E90	E90	E90	E90	E90															
TELEFONIKA	A			E90			E90						E90			E90		E90				E90														
	B			E90			E90						E90			E90		E90				E90														
	D	E30		E90									E90					E60																		
	H	E90		E90			E90					E90				E90	E90	E90	E90	E90	E60															
	J			E30			E60						E60					E30																		
	L			E90			E90						E90			E90		E90					E90													
	M			E90			E90						E90					E90			E30															
	O			E90			E90						E90			E90		E90			E30															
	P			E90			E90						E90			E90		E90				E30														
	R			E90			E90						E90			E90		E90					E90													
T			E90			E90						E90			E90		E90					E90														
V			E90			E60						E60					E90				E60															
X			E90			E90						E90			E90		E90				E30	E90														



### 2.2.1 Installation

The Cable Connection and Fastening Systems of BAKS shall be fastened to the concrete base of the class  $\geq$  B20/C25, or to natural stone. The following methods of installation are also acceptable:

- fastening to any other foundation of at least the same class of fire resistance (fire resistance rating R30, R60, R90) as fire resistance of the Cable Set, with the use of appropriate and certified pins, anchors, nails or bolts.
- stacking the cables in a cable tray or cable ladder with maintained acceptable load value for any particular cable route E30-E90.
- fastening of cables with the use of steel grip placed in a tube or on a plastic strip.
- laying a cable route of the width not exceeding 400mm, on a channel section of the length up to 2000mm.

Expansion sleeve and fastening bolt shall be made of steel or any other material corresponding to the required fire-resistance rating.

The basic parameters of cable tray fastening- see Table 4.

The basic parameters of cable ladder fastening- see Table 5.

The basic parameters of other types of cable fastening- see Table 6.

The basic parameters of mesh tray fastening- see Table 7.

The Cable Sets of BAKS may be manufactured in the form of constructions fastened to the ceiling or to a flat roof.

The Cable Connection and Fastening Systems of BAKS may be manufactured in the form of suspended constructions – fastened to the ceiling, roof, steel construction, trapezoidal sheet plate, or directly to the wall, including plasterboard wall- according to records shown in Tables 4-7. In case of installation to the concrete/tile floor a channel section should be used as an intermediate element between the cable tray and a floor. The channel section shall be firmly fastened to the base and additionally bolted to the cable route. The spacing between section channels- according to records shown in Tables

At laying the cables or wiring of fire resistance E30 - E90 on the roof a cable route shall be used which is resistant to atmospheric conditions and which is a satisfactory protection for any cable installation against UV radiation. Segregation of cables shall be maintained with fastening to the foundation which provides stability of the cable route under construction.

The methods and options of the Cable Connection and Fastening Systems of BAKS installation – see the Figures in Tables 8, 9, 10, 11, 12, of Point 2.2 of this Technical Approval. The following boundary conditions shall be observed:

Drop-in-anchors and anchor bolts M8, M10, M12 shall be sunk into concrete at min. 60 mm, and the M6 type at minimum 30 mm. The tension strength per single pin shall not exceed the value of 500 N. As alternative, other types of anchor pin may be used with fire safety properties which are fully proved.

It should be guaranteed that the Cable Connection and Fastening Systems of BAKS and its class of functions maintenance shall be free of any threat and damages from the construction elements falling down.

## 3 TECHNICAL PROPERTIES / REQUIREMENTS

### 3.1 Construction

#### 3.1.1 Product quality

**Sformatowano:** Odstęp Przed: 0 pkt,  
Po: 0 pkt, Punktowane + Poziom: 1 +  
Wyrównanie: 1,9 cm + Wcięcie: 2,54  
cm

The particular elements of the Cable Connection and Fastening Systems of BAKS shall be manufactured in a good and workmanlike manner, and the system installation shall be carried out in accordance with this Technical Approval.

### 3.1.2 Product basic dimensions

The dimensions of the cable support structures of BAKS shall comply with the manufacturer's catalogue.

### 3.1.3 Functionality

The Cable Connection and Fastening Systems of BAKS shall be designed to guarantee the proper operation in the E-30, E-60 or E-90 Class, for 30, 60 or 90 minutes respectively, acc. to DIN 4102-12 standard. The above mentioned Cable Connection and Fastening Systems shall be installed in accordance with the requirements of this Technical Approval and in accordance with the requirements of the manufacturer to assure continuous supply of the electric power and signal transmission for the period of time required to set in motion and activate a device used for fire protection (by sustaining the electric functions)

## 3.2 Technical properties

The Cable Connection and Fastening Systems of BAKS have been designed to comply with the requirements shown in Table 14 below

**Table 14**

No.	Properties	Requirements	Methods of testing
1.	Maintenance of the cable set function  (assuring continuous supply of the electric power and signal transmission for the period of time required to set in motion and activate the devices used for fire protection)	Class E-30, E-90 acc. to DIN 4102-12, for 30 and 90 minutes, according to the regulations in Poland	Acc. to PN-EN 1363-1 and DIN 4102-12

## 4. PACKAGING, STORAGE, TRANSPORT

### 4.1 Packaging

The elements of the cable support structures of BAKS shall be packed in a unit or bulk packages for protection against mechanical damage and environmental conditions. For the time of transport the products shall be packed tightly to eliminate the risk of damage at reloading or transportation.

Each package shall contain the following information:

- manufacturer's name and logo;
- product symbol;
- number of pieces per package for any particular system elements (for the bulk packages).

#### Cables

Mill prefabricated lengths shall be finished tightly

Cable packaging shall be carried out according to the PN-E-79100 standard requirements

### 4.2 Storage

#### Cable support structures of BAKS

The elements of the BAKS cable support structures are subject to storing according to the following conditions:

1. The products under delivery (i.e. in the original BAKS packages) shall be stored in dry and air permeable premises.
2. At storing protect the products against rapid change in air humidity and temperature in order to avoid water vapour. White corrosion stains may appear if this condition is not observed.
3. In the event of temporary storing at open space take care that moisture is carried away. Appropriate screen should be used to provide sufficient air permeability for the products.
4. It is absolutely necessary that any wet products are air-dried accurately. Before storing the elements should be placed separately until they are dry.

#### **Cables**

Cable storing shall be carried out according to the PN-E-79100 standard requirements

### **4.3 Transport**

#### **Cable support structures of BAKS**

The transport of the BAKS cable support structure elements packed acc. to Point 4.1 may be carried out with any means of transport. According to the transport regulations in force all of the construction elements shall be dully protected against mechanical damage and relative humidity exceeding 95 % at the temperature of +40 °C.

#### **Cables**

The transport of cables shall be carried out according to the PN-E-79100 standard requirements

## **5. Conformity Assessment**

### **5.1 General principles**

Pursuant to Art.4 and Art.5, section, point 3, and Art. 8, section 1, of the Act dated 16th April 2004, on construction products (Journal of Acts No. 92, item 881, as amended) the product referred to in this Technical Approval may be introduced to the market and used in construction works in the scope which is adequate to the product properties and destination provided the manufacturer has had the assessment of conformity made and by issuing the domestic declaration of conformity at its sole responsibility declares that the product complies with the **Technical Approval AT-0605-0270/2010/2015** and has been marked with the building sign in accordance with the separate regulations in force.

Pursuant to the ordinance by the Minister of Infrastructure dated 11th August 2004, on the methods to declare construction products conformity and the methods to mark them with the building sign (Journal of Acts No. 98, item 2041) the assessment of conformity of the **Cable Connection and Fastening Systems of BAKS** shall be made by the manufacturer based on the System No.1 and in relation to the product conformity certification carried out by the accredited certification body on the grounds of the following procedures:

- a) the tasks from the manufacturer, i.e:
  - the factory control of production,
  - complementary testing of samples taken in the factory, carried out by the manufacturer according to the agreed testing schedule,
- b) the tasks from the accredited body:
  - preliminary testing of the product type,
  - preliminary inspection of the factory and inspection of the factory production control system.
  - continuous surveillance, evaluation and approval of the factory production control system.

### **5.2 Preliminary testing of the product type**

Preliminary testing of the type is a confirmation of the required product technical and performance characteristics before its marketing and application. Preliminary testing shall be carried out on the occasion of any change of raw materials, components, method of production,

including modifications of the Factory Production Control system, provided they might affect the product performance features.

Under this Technical Approval preliminary testing of the type shall be carried out by the accredited testing laboratories based on the assessment of conformity according to System No.1.

The scope of preliminary testing of the type includes every type of tests specified in Table 6, and in Point 3.2.

Positive results of the approval testing carried out at the accredited laboratories, which in the course of granting this **CNBOP-PIB Technical Approval AT-0605-0270/2010/2015 Edition** were the base to determine the technical and performance characteristics of the product, may be recognized as the preliminary testing of the type within the conformity assessment.

### 5.3 Factory Production Control system (FPC)

#### 5.3.1 Introduction

The manufacturer should create, document and maintain the control system in the production plant in order to ensure that the marketed products comply with the established performance characteristics.

If the manufacturer designed, assembled, packed, processed and marked a subunit through its subcontractor, the Factory Production Control system in effect with the subcontractor must be considered. If the work is subcontracted, the manufacturer should retain control of the subunit and ensure that it is provided with all information needed to meet its obligations, pursuant to this approval. The manufacturer who uses the subcontractor in respect of all its activities may not itself, in any circumstances, transfer its obligations to the subcontractor. The FPC system is a permanent internal production control measure, carried out by the manufacturer.

All the elements, requirements and assumptions introduced by the manufacturer shall be documented systematically in the form of procedures.

The documentation of the production control system should ensure the general understanding of the evaluation of compliance and allow to achieve the required performance characteristics of the product and effective operation of the production control system which is to be verified. Therefore, the control service in the production plant uses exploitation techniques and all measurements allowing to maintain and control the product compliance with technical specifications. To ensure that they are introduced, there should be carried out controls and tests of measurement devices, raw materials and components, processes, production installations and equipment and finished subunits, including the properties of the material, and by use of the results obtained.

#### 5.3.2 General requirements

If applicable the Factory Production Control System (FPC) shall comply with the requirements shown in the following chapters of the EN ISO 9001:2000 standard:

- 4.2, with exclusion of 4.2.1 a)
- 5.1e), 5.5.1, 5.5.2
- chapter 6
- 7.1, with exclusion of 7.1a), 7.2.3c), 7.4
- 8.2.3, 8.2.4, 8.3, 8.5.2
- FPC may constitute a part of the Quality Management System, e.g. in accordance with the EN ISO 9001 standard.

#### 5.3.3 Special requirements relating to the product components

##### 5.3.3.1 The Factory Production Control system shall:

- relate to this Technical Approval; and
- shall assure that the marketed **Cable Connection and Fastening Systems of BAKS in the electric function maintenance Class E30, E60, E90 (for 30, 60 and 90 minutes respectively)** comply with the determined performance characteristics;

##### 5.3.3.2 The Factory Production Control shall contain the quality schedule or the FPC schedule which is specific for the product's component and which allows identification of procedures required to prove its conformity at any particular stage, i.e:

- a) inspection and testing carried out before and/ or at manufacturing of the **Cable Connection and Fastening Systems of BAKS in the electric function maintenance Class E30, E60, E90 (for 30, 60 and 90 minutes)**, with frequency specified below, and/or

b) verification and examination of the finished products with frequency specified below.

If the manufacturer uses the finished subunits in production, then the operations as per b) should lead to such level of compliance of a subunit that is equal to the level achieved if normal FPC procedures were performed during production.

If the manufacturer does a part of the production, then the operations as per b) may be reduced and partly replaced by the operations as per a). Generally, the more of the production is done by the manufacturer, the more of the operations as per a) may be replaced by the operations as per a). In every case, the operation should lead to such level of compliance of a subunit that is equal to the level achieved if normal FPC procedures were performed during production.

Note: depending on the specific case, it may be necessary to perform actions mentioned under a) and b), or only the actions mentioned under a) or only the actions mentioned under b).

The actions as per a) should refer mainly to the average state of a subunit/product and to production facilities and their controls as well as to measurement devices etc. Such control and testing and their frequency are determined based on type, production process and its complexity, susceptibility/sensitivity of the properties of a subunit to changes in the production parameters etc.

The manufacturer should establish and maintain records constituting evidence that samples of a product were taken in the course of manufacture and examined. These records should clearly show whether the production complies with the defined acceptance criteria; such records should be kept for at least ten years. If a sample does not comply with the acceptance requirements, actions should be undertaken in respect of noncompliant products. Necessary correction actions should be undertaken immediately, and noncompliant subunits or sets of subunits should be separated and clearly identified. If an irregularity has been corrected, then the testing and verification of them should be repeated.

Results of control and testing should be accurately recorded. The description of a subunit, the production date, the applied method of testing, results of testing and acceptance criteria should be included in the records, signed by the person responsible for the control/testing. Taking into consideration the result of control that does not comply with the requirements of this approval, correction actions aimed at remedying the situation (e.g. subsequent testing, change of production process, withdrawing or improving a sub-unit) should be indicated in the records.

**5.3.3.3 Individual subunits or sets of subunits used for production of the Cable Connection and Fastening Systems of BAKS in the electric function maintenance Class E30, E60, E90 (for 30, 60 and 90 minutes) and the related documentation should be fully identifiable.**

### **5.3.2 Preliminary inspection of the factory and the Factory Control of Production system**

**5.3.4.1** A preliminary control of the factory and the FCP system should be performed, as a rule, when the production is already implemented and the FCP system is already in use. However, it is possible that the initial control of the factory and FCP will be performed before production is implemented and/or FCP is already in use.

**5.3.4.2** The following elements should be subjected to evaluation to verify that the requirements as per 5.2.2 and 5.2.3 have been fulfilled:

- the Factory Production Control system documentation ; and
- the production plant.

In evaluating the production plant the following should be verified:

- a) that all the means necessary to achieve the operational characteristics of **the Cable Connection and Fastening Systems of BAKS in the electric function maintenance Class E30, E60, E90 (for 30, 60 and 90 minutes)**, required by this approval (see 5.3.4.1) are or will be available;
- b) that the FPC system procedures, according to the FPC system documentation, are or will be put into use; and
- c) that the subunit complies or will comply with the samples used in the initial type testing and whose compliance with this approval has been verified; and
- d) if the FPC system is a part of the quality management system in accordance with EN ISO 9001 and as being part of such quality management system is certified and subject to annual supervision of the certifying authority, recognized by an accredited entity being a member of the European Co-operation for Accreditation which signed the Multilateral Agreement (MLA).

CNBOP-PIB	AT-0605-0270/2010, 4th Edition of 15 April 2013	page 38/45
-----------	---	------------

**5.3.4.3** All the manufacturer's plants in which final assembly or at least final testing is carried out should be subjected to evaluation in order to verify whether the conditions as per 5.3.4.2 a) to c) exist. A single evaluation may concern one or more subunits of products, production lines and/or production processes. If the FPC system concerns more than one subunits of products, production lines and/or production processes and if has been verified that the general requirements have been fulfilled, then the detailed verification of the FPC requirements specific for subunits of the product, carried out for a single subunit of the product may be recognized as being representative for other FPC subunits.

**5.3.4.4** The evaluations previously made in accordance with the requirements of this approval may be considered, provided that they have been made in the same compliance evaluation system, using the same product, designed, constructed in a similar way and of a similar functionality, so that the results might be applicable to the product in question.

**5.3.4.5** Any assessment and the assessment results in relation to the Factory Production Control system are subject to documentation in the form of report.

### **5.3.5 Continuous inspection of the Factory Production Control system**

**5.3.5.1** All factories which were subject to assessment according to Point 5.3.4 shall be assessed once a year again, with exclusion as stated in Point 5.3.5.2.

**5.3.5.2** In the event continuous surveillance relating to the Factory Production Control system is provided by manufacturer the frequency of repeatable assessments by the third party in the manufacturer's factory may be reduced and replaced with the acceptance and surveillance procedures in relation to the FPC system.

**Note 1:** If justified periodical acceptance and surveillance from the third party shall be accepted based on the system documentation survey

**5.3.5.3** Evaluation and the evaluation results are subject to documentation in the form of report.

### **5.3.6 Modification procedures**

In the event of the component, product, production method or Factory Production Control system modification (provided it may affect the product technical features) a repeated assessment of the factory and the Factory Production Control system shall be carried out in relation to the issues which might be affected by the process of modification.

Evaluation and the evaluation results are subject to documentation in the form of report.

## **5.4 The finished product testing**

The schedule of the finished product testing includes the on-going testing and periodical testing.

### **5.4.1. On-going testing schedule**

The scope of on-going testing shall relate to elements of the Cable Connection and Fastening Systems of BAKS specified in the technical approvals which were issued for the wires/cables and the cable support structures.

The on-going testing is subject to the Factory Control of Production according to which the manufacturer shall guarantee that the product technical properties comply with this Technical Approval requirements.

The on-going testing results shall be registered on the continuous basis and the register records should confirm that the products comply with any respective conformity assessment criteria. Each product lot shall be easily identified in the register of testing

According to the Factory Production Control procedures the manufacturer shall declare the acceptable quality level of the product.

### **5.4.2 Periodical testing**

Periodical product testing shall be carried out if the product was subject to any relevant technical changes. The manufacturer undertakes to advice the approving institution on any changes introduced to the product. The periodical testing schedule shall be adjusted respectively to the changes or modification of the product.

CNBOP-PIB	AT-0605-0270/2010, 4th Edition of 15 April 2013	page 39/45
-----------	---	------------

## 5.5 Methods of testing

The product testing shall be carried out according to the methods specified in Table 14 of this Technical Approval. The obtained results shall be compared with the respective point requirements. Appropriate environment and testing conditions should be guaranteed at the time of sampling as defined in the standard documents specified in Point 3.2 and Table 14 of this Technical Approval.

## 5.6 Sampling

Random sampling shall be taken according to PN-83/N-03010 or any other equivalent standard.

## 5.7 Evaluation of testing results

The manufactured product **the Cable Connection and Fastening Systems of BAKS in the electric function maintenance Class E30, E60, E90 (for 30, 60 and 90 minutes)** shall be found compliant with the requirements of this Technical Approval if the results of all tests are positive

## 6. FORMAL ARRANGEMENTS

**6.1** The **AT-0605-0270/2010/2015 Edition** CNBOP-PIB Technical Approval is a document confirming the applicability of the product **the Cable Connection and Fastening Systems of BAKS in the electric function maintenance Class E30, E60, E90 (for 30, 60 and 90 minutes)** in the building industry in the scope determined by the provisions of this Technical Approval.

**6.2** The specification of operational characteristics and technical properties and the required quality thereof, as provided for in the Technical Approval are the basis for the Manufacturer to make the evaluation of compliance and to issue, at its own exclusive responsibility, the domestic certificate of compliance.

**6.3** The Technical Approval **AT-0605-0270/2010/2015 Edition** confirms a positive evaluation of the product as it is produced by the Manufacturer and notified for the approval procedure. The approval procedure does not change or improve the product by assigning to it other requirements than those declared by the Applicant and any other ways of testing the operational characteristics and technical properties of the product than those actually applied in production, the testing of the product type and the on-going production control

**6.4** This Technical Approval does not authorize the manufacturer to label a construction product before it is marketed.

**6.5** The product should be delivered to the recipient subject to the terms and conditions relating to packaging, storage and transportation, set out under point 4 of this Technical Approval. This condition applies to the Supplier at all the stages of distribution of the product, from the manufacturer to the end-user.

**6.6** The Technical Approval does not release the manufacturer from liability for the quality of a construction product, each batch of such product and its individual copies, and the contractors of construction works from liability for the proper use thereof.

**6.7** The guarantee for the construction product to which this Technical Approval is related must be given by the Manufacturer on the basis of separate provisions.

**6.8** The content of published prospectuses and announcements and of other documents relating to the marketing and use of the product to which this Technical Approval relates in the construction industry, should contain the information that the product has been given Technical Approval CNBOP-PIB **AT-0605-0270/2010/2015 Edition**.

**6.9** The Technical Approval CNBOP-PIB does not violate the rights arising out of the provisions on the industrial property protection, and in particular the notice of the Speaker of the Parliament of the Republic of Poland on the Publication of a Uniform Text of the Act-Industrial Property Law (Journal of Laws 2013 No. 0 item 1410). The ensuring of such rights is the duty of the person using this Technical Approval.

<b>CNBOP-PIB</b>	<b>AT-0605-0270/2010, 4th Edition of 15 April 2013</b>	<b>page 40/45</b>
------------------	--	-------------------

**6.10** The manufacturer has an obligation to verify whether the solution in respect of which the Technical Approval has been given does not violate any third party rights.

**6.11** The liability for any damage made to anyone as a result of the defect in the product shall be borne by the Manufacturer.

**6.12** In granting the Technical Approval CNBOP-PIB does not assume any liability for any violation of exclusive or accrued rights.

**6.13** CNBOP-PIB may change the operational characteristics and technical properties specified in this Technical Approval. This requires a written application, with substantiation, submitted by the manufacturer and carrying out an approval procedure in the scope relating to the changes .It is not permissible to make any changes in the content of the Technical Approval in the procedure other than as that described above.

**6.14** This Technical Approval may be withdrawn by the CNBOP-PIB in the event of changes in any separate regulations and standards issued by international institutions, if provided for in the agreements made, substantial changes in scientific assumptions and the state of practical knowledge and the lack of confirmation of the positive evaluation of the suitability of the building product in the course of its application. The Technical Approval may be revoked on own initiative of CNBOP-PIB or on motion of the Chief Inspector of the Building Supervisory Authority, after concluding explanatory proceedings with the participation of the applicant.

## **7. VALIDITY EXPIRATION DATE**

This Technical Approval CNBOP-PIB **AT-0605-0270/2010/2015 Edition**  
remains valid until 9<sup>th</sup> February 2020

The validity of the Technical Approval CNBOP-PIB may be extended without renewed approval proceeding if the Applicant or the Applicant's legal successor applies for it to the Scientific and Research Centre for Fire Protection –The State Research Institute, not later than 3 months prior to the validity termination date.

## **THE END OF TECHNICAL APPROVAL**



**ADDITIONAL INFORMATION**

The Act dated 16<sup>th</sup> April 2004, construction products (Journal of Laws No. 92, item 881, as amended).

The ordinance by the Minister of Infrastructure, dated 12th April 2002, on technical conditions for the buildings and their location (Journal of Laws No. 75, item. 690, as amended).

The ordinance by the Minister of Infrastructure, dated 8th November 2004, on technical approvals and organizational units authorized to issue them (Journal of Laws No 249, item. 2497, as amended).

The ordinance by the Minister of Infrastructure, dated 11th August 2004, on methods to declare conformity of the construction products and the methods of the construction product labeling (Journal of Laws No. 198, item. 2041, as amended).

The ordinance by the Minister of Interior and Administration, dated 7th June 2010, on fire protection of buildings and other related objects and areas. (Journal of Laws No. 109, item 719.

**Applied standards and associated documents**

PN-EN 13501-2	Fire classification of the construction products and building elements. Part 2: Classification based on the resistance testing, with exclusion of the service utilities
PN-B-02851-1	Fire protection of buildings-Building element fire resistance testing- General requirements and qualification
PN-EN 1363-1	Fire resistance testing – Part 1. General requirements
PN-EN 50200	Methods of thin cable and wire flammability testing in protection circuits. Cables and wires without special protection.
PN-IEC 60331-21	Testing of cables and electric conduits in fire conditions – Circuit continuity - Part 21: Methods of testing and requirements – Cables and wires with nominal voltage not exceeding 0,6/1,0 kV
DIN 4102-2	Fire specification of materials and construction elements – Part 2: Construction elements, definitions, requirements and testing
DIN 4102-4	Fire specification of materials and construction elements – Part 4: Summary and application of the classified construction materials, construction elements and specialty construction elements
DIN 4102-12	Fire specification of materials and construction elements – Part 12: Maintenance of electric functions in the Cable Connection and Fastening Systems – Requirements and testing

**Reports- Reports from testing- Evaluation- Classifications, used in the process of approval.**

1. Report from the testing No. 31/13, of 28.07.2004, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
2. Report from the testing No. 31/15, of 31.08.2005, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
3. Report from the testing No. 31/20, of 21.04.2006, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
4. Report from the testing FIRES-FR-054-06-AUNE z 23.06.2006, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
5. Report from the testing No. 31/22, of 31.07.2006, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
6. Report from the testing FIRES-FR-109-06-AUNE z 09.10.2006, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.

7. Report from the testing No. 31/24, of 30.11.2006, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
8. Report from the testing No. 31/25, of 30.11.2006, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
9. Report from the testing No. 31/26, of 30.11.2006, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
10. Report from the testing FIRES-FR-160-06-AUNE z 08.12.2006, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
11. Report from the testing No. 31/29, of 31.01.2007, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
12. Report from the testing No. 31/30, of 31.01.2007, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
13. Report from the testing FIRES-FR-040-07-AUNE, of 19.03.2007, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
14. Report from the testing FIRES-FR-086-07-AUNE, of 19.06.2007, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
15. Report from the testing FIRES-FR-102-07-AUNE, of 12.07.2007, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
16. Report from the testing FIRES-FR-129-07-AUNE, of 03.08.2007, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
17. Report from the testing No. 31/34, of 22.08.2007, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
18. Report from the testing FIRES-FR-162-07-AUNE, of 20.09.2007, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
19. Report from the testing FIRES-FR-202-07-AUNE, of 22.11.2007, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
20. Report from the testing LP-1369/06, of 18.12.2007, carried out at the ITB Fire Testing Institute, ul. Ksawerów 21, 02-656 Warsaw
21. Report from the testing FIRES-FR-234-07-AUNE, of 07.01.2008, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
22. Report from the testing FIRES-FR-235-07-AUNE, of 14.01.2008, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
23. Report from the testing FIRES-FR-012-08-AUNE, of 07.02.2008, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
24. Report from the testing FIRES-FR-061-08-AUNE, of 27.05.2008, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
25. Report from the testing FIRES-FR-063-08-AUNE, of 27.05.2008, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
26. Report from the testing FIRES-FR-151-08-AUNE, of 27.08.2008, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
27. Report from the testing FIRES-FR-198-08-AUNE, of 29.10.2008, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
28. Report from the testing FIRES-FR-257-08-AUNE, of 17.12.2008, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
29. Report from the testing FIRES-FR-256-08-AUNE, of 19.12.2008, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
30. Report from the testing FIRES-FR-004-09-AUNE, of 25.02.2009, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.

31. Report from the testing FIRES-FR-057-09-AUNE, of 09.06.2009, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia
32. Report from the testing FIRES-FR-094-09-AUNE, of 17.07.2009, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia
33. Report from the testing No. 31/43, of 30.10.2009, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
34. Report from the testing No. 31/44, of 30.10.2009, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
35. Report from the testing No. P-1008 DMT-DO, of 01.11.2009, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
36. Report from the testing FIRES-FR-201-09-AUNE, of 20.01.2010, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia
37. Report from the testing FIRES-FR-090-10-AUNE, of 23.06.2010, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia
38. Report from the testing DMT-DO 31/49, of 30.06.2010, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany
39. Report from the testing FIRES-FR-121-10-AUNE, of 30.07.2010, carried out at the Fires s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia
40. Report from the testing FIRES-FR-171-10-AUNE z 22.10.2010, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
41. Report from the testing DMT-DO 31/50, of 25.10.2010, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany
42. Report from the testing DMT-DO 31/51, of 09.12.2010, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany
43. Report from the testing DMT-DO 31/52, of 20.12.2010, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany
44. Report from the testing No. P-1009 DMT-DO, of 18.01.2011.2009, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
45. Report from the testing FIRES-FR-044-11-AUNE, of 20.05.2011, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
46. Report from the testing FIRES-FR-086-11-AUNE, of 21.05.2011, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
47. Report from the testing FIRES-FR-126-11-AUNE, of 27.06.2011, carried out at the Fires 90, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
48. Report from the testing FIRES-FR-196-11-AUNE, of 26.10.2011, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia
49. Report from the testing FIRES-FR-266-11-AUNE, of 23.02.2012, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
50. Report from the testing FIRES-FR-020-12-AUNE, of 29.02.2012, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
51. Report from the testing FIRES-FR-102-12-AUNE, of 18.05.2012, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia..
52. Report from the testing FIRES-FR-135-12-AUNE, of 21.07.2012, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
53. Report from the testing FIRES-FR-217-12-AUNE, dated 27.09.2012, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
54. Report from the testing FIRES-FR-245-12-AUNE, of 14.12.2012, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia.

55. Report from the testing FIRES-FR-005-13-AUNE, of 24.01.2013, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia
56. Report from the testing DMT-DO 31/55, of 31.01.2013, carried out at the DMT GmbH-Fachstelle Für Brandschutz, Temoniastrasse 13, 44137 Dortmund, Germany.
57. Report from the testing FIRES-FR-030-13-AUNE, of 28.02.2013, carried out at the Fires, s.r.o., Osloboditel,ov 282, 059 35 Batizovce, Slovakia
58. Report from the testing FIRES-FR-060-13-AUNE2 z 19.04.2013 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
59. Report from the testing FIRES-FR-079-13-AUNE2 z 06.06.2013 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
60. Report from the testing FIRES-FR-108-13-AUNE3 z 12.07.2013 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
61. Report from the testing Nr DMT 31-58 z 07.08.2013 r. carried out at the DMT GmbH - Fachstelle Für Brandschutz w Tremoniastrasse 13, 44137 Dortmund, Niemcy.
62. Report from the testing FIRES-FR-160-13-AUNE2 z 26.09.2013 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
63. Report from the testing FIRES-FR-183-13-AUNE2 z 25.10.2013 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
64. Report from the testing FIRES-FR-204-13-AUNE3 z 19.11.2013 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
65. Report from the testing FIRES-FR-224-13-AUNE4 z 02.12.2013 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
66. Report from the testing DMT 31-53 z 19.12.2013 r. carried out at the DMT GmbH - Fachstelle Für Brandschutz w Tremoniastrasse 13, 44137 Dortmund, Niemcy.
67. Report from the testing DMT 31-57 z 19.12.2013 r. carried out at the DMT GmbH - Fachstelle Für Brandschutz w Tremoniastrasse 13, 44137 Dortmund, Niemcy.
68. Report from the testing DMT 31-60 z 15.01.2014 . carried out at the DMT GmbH - Fachstelle Für Brandschutz w Tremoniastrasse 13, 44137 Dortmund, Niemcy.
69. Report from the testing FIRES-FR-016-14-AUNE z 30.01.2014 carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
70. Report from the testing FIRES-FR-049-14-AUNE2 z 04.04.2014 carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
71. Report from the testing DMT-31-59 z 25.04.2014 r. carried out at the DMT GmbH - Fachstelle Für Brandschutz w Tremoniastrasse 13, 44137 Dortmund, Niemcy.
72. Report from the testing DMT 31-61 z 20.05.2014 r. carried out at the DMT GmbH - Fachstelle Für Brandschutz w Tremoniastrasse 13, 44137 Dortmund, Niemcy.
73. Report from the testing FIRES-FR-066-14-AUNE2 z 23.05.2014 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
74. Report from the testing FIRES-FR-098-14-AUNE2 z 27.05.2014 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
75. Report from the testing FIRES-FR-129-14-AUNE2 z 17.07.2014 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
76. Report from the testing DMT 31-70 z 04.08.2014 r. carried out at the DMT GmbH - Fachstelle Für Brandschutz w Tremoniastrasse 13, 44137 Dortmund, Niemcy.
77. Report from the testing FIRES-FR-143-14-AUNE3 z 22.08.2014 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.
78. Report from the testing FIRES-FR-156-14-AUNE2 z 28.08.2014 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.

<b>CNBOP-PIB</b>	<b>AT-0605-0270/2010, 4th Edition of 15 April 2013</b>	<b>page 45/45</b>
------------------	--	-------------------

79. Report from the testing FIRES-FR-174-14-AUNE2 z 21.11.2014 r. carried out at the Fires, s.r.o. Osloboditel,ov 282, 059 35 Batizovce, Slovakia.

#### **Documents**

<b>No.</b>	<b>Document's name</b>	<b>Document's number</b>	<b>Date</b>
1	Documents for the application to make amendments to the Technical Approval AT-0605-0270/2010 wydanie 4	0760/DA/2015	12.01.2015