

FUNCTION IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION FIRES-JR-009-17-NURE

Cable bearing system BAKS with cables business Zaklady Kablove BITNER

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FUNCTION IN FIRE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION IN ACCORDANCE WITH DIN 4102-12: 1998-11

FIRES-JR-009-17-NURE

Name of the product: Cable bearing system BAKS
with cables business Zaklady Kablowe BITNER

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1. INTRODUCTION

This expert judgement report with classification defines the function in fire classification assigned to element „Cable bearing system BAKS with cables business Zaklady Kablowe BITNER” in accordance with the classes given in DIN 4102 – 12: 1998-11.

Test of function in fire was carried out according to standard STN 92 0205: 2014. Similar standards and regulations for tests of function in fire is DIN 4102-12: 1998-11.

Deviations from standard at the test according to DIN 4102-12: 1998-11: This test was carried out according to standard STN 92 0205: 2012 and meets requirements of DIN 4102-12: 1998-11. Basic deviation in process and carrying out of test between these standards is in measuring and in control of temperature in the test furnace. According to STN 92 0205: 2012, plate thermometers according to EN 1363-1: 1999 are used. According to DIN 4102-12: 1998-11, common thermocouples of construction which was used for this measurement till issue of EN 1363-1:1999 are used. Measurement by plate thermometers acc. to EN 1363-1: 1999 can be considered as stricter method of temperature control in test furnace in compare with thermocouples used till issue of EN 1393-1: 1999. Therefore, it is possible to use results of test according to STN 92 025: 2012 for classification of tested cables according to DIN 4102-12: 1998-11, but not conversely. Identified deviation results in stricter course of test and it can lead to reduced classification of tested cables what is accepted as enhanced security in practice.

This expert judgement report defines field of application which is outside the field of direct application according test standard or outside the field of extended application according to relevant extended application standard. This expert judgement expresses the opinion of the FIRES and is based on the experience or internal rules of FIRES.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element, Cable bearing system BAKS with power and communication halogen free cables business Zaklady Kablowe BITNER, is defined as a cable bearing system for power and communication halogen free cables with circuit integrity maintenance.

2.2 PRODUCT DESCRIPTION

The element comprise of cable bearing system BAKS – cable trays KBL, KCP/KCOP, KFJ, KGJ/KGOJ, cable mesh trays KDSO with clips UKZ1, cable ladders DUP, DFP and accessories (consoles WPCB, supports CMP, CTMT, hangers WKS/WKSO, WPPGV/WPPOV, brackets WWS/WWSO, holders ZM/ZMO, threaded rods PG, etc.) with power and communication non-halogen cables business Zaklady Kablowe BITNER, type (N)HXH, (N)HXCH, BiTflame 1000, BITservo FS, HTKSH, HTKSHekw, HDGs, HDGsekwf and HLGsekwf with circuit integrity maintenance in fire.

Cable trays KCP/KCOP

Cable trays are made from galvanized steel sheet thickness 1,5 mm. Height of side wall is 60 mm and maximum tested width of cable tray is 600 mm. Trays are fixed together by two junctions LPP/LPOPH60 (galvanized steel sheet thickness 1,5 mm) with nut bolts SGK M6x12 (4 pcs per junction) on sides and by junction BL/BLO (galvanized steel sheet thickness 1,0 mm) with nut bolts SGK M6x12 (8 pcs) on the bottom. Trays are used as bearing system for the cables. Maximum loading of cable trays is 25 kg.m⁻¹ (KCP400H60 is 20 kg.m⁻¹ and KCP100H60F is 5 kg.m⁻¹).

Tested trays were KCP/KCOP600H60, KCP/KCOP400H60 and KCP/KCOP100H60F (hot deep galvanized steel).

Cable trays KBL

Cable trays are made from galvanized steel sheet thickness 0,7 mm without perforation. Height of side wall is 60 mm and maximum tested width of cable tray is 300 mm. Trays are fixed together by nut bolts SGK M6x12 (7 pcs). Maximum loading of cable trays is 20 kg.m⁻¹. Tested trays were KBL300H60.

**Cable trays KFJ**

Cable trays are made from galvanized steel sheet thickness 1,0 mm without perforation. Height of side wall is 60 mm and maximum tested width of cable tray is 400 mm. Trays are fixed together by integrated coupling. Maximum loading of cable trays is 12 kg.m⁻¹. Tested trays were KFJ400H60.

Cable trays KGJ/KGOJ

Cable trays are made from galvanized steel sheet thickness 1,0 mm. Height of side wall is 60 mm and maximum tested width of cable tray is 400 mm. Trays are fixed together by nut bolts SGK M6x12. Maximum loading of cable trays is 20 kg.m⁻¹. Tested trays were KGJ/KGOJ400H60.

Cable mesh trays KDS/KDSO

Cable mesh trays are made from galvanized steel wire Ø 4,0 mm. Height of side wall is 60 mm and maximum tested width of cable mesh tray is 60 mm. Mesh trays are fixed together by couplings USSN/USSO (2 pcs). Maximum loading of cable mesh trays is 2,8 kg.m⁻¹. Tested mesh trays were KDS/KDSO60H60.

Cable ladders DUP

Cable ladders are made from galvanized steel sheet thickness 1,5 mm and spacing of transoms is 300 mm. Height of side wall is 60 mm and maximum tested width of cable ladder is 600 mm. Cable ladders are fixed together by two junctions LDC/LDOCH60 and nut bolts SGK M8x14 on sides (4 pieces per junction). Maximum loading of cable ladders is 30 kg.m⁻¹ (DUP400H60 is 20 kg.m⁻¹). Tested ladders were DUP400H60 and DUP 600H60.

Cable ladders DFP

Cable ladders are made from galvanized steel sheet thickness 1,5 mm and spacing of transoms is 300 mm. Height of side wall is 60 mm and maximum tested width of cable ladder is 400 mm. Cable ladders are fixed together by integrated coupling. Maximum loading of cable ladders is 12 kg.m⁻¹ (DFP300H60 is 10 kg.m⁻¹). Tested ladders were DFP300H60 and DFP400H60.

Consoles WPCB

Consoles consist of base plate with dimensions (130x45x5) mm and support with dimensions (50 x 35 x 2) mm. Consoles are used for gripping of brackets to ceiling.

Brackets WWS/WWSO

Brackets are made from galvanized steel sheet thickness 2,0 mm or 2,5 mm. Tested brackets are WWS/WWSO300. Brackets are used to gripping trays or ladders to consoles or to wall.

Brackets WWCT

Brackets are made from galvanized steel sheet thickness 3,0 mm and base plate with dimensions (90x50x8) mm. Brackets are used to gripping trays or ladders to consoles or to wall. Tested brackets were WWCT100F (hot deep galvanized steel).

Supports CMP

Supports CMP41H21 with dimensions (41x21) mm and supports CMP41H41 with dimensions (41x41) mm are made from galvanized steel sheet thickness 1,5 mm. Supports with threaded rods are used to gripping trays or ladders to ceiling.

Supports CTMT

Supports with dimensions (40x60) mm are made from galvanized steel sheet thickness 3,0 mm. Supports with threaded rods are used to gripping trays or ladders to ceiling.

Hangers WKS/WKSO60

Hangers are made from galvanized steel sheet thickness 2,0 mm. Hangers are used to gripping mesh trays to ceiling or to wall.

Adjustable hangers WPPGV/WPPPOV

Hangers are made from galvanized steel sheet thickness 5,0 mm. Hangers are used to gripping threaded rods PG to ceiling or to wall.

Partitions PGJ

Partition is made from galvanized steel sheet thickness 1,0 mm. Partition is fixed to cable tray or mesh tray by nut bolts SGK M6x12 or clamping pieces ZS/ZSO and is used for separation of cables. Tested partitions were PGJH40F (hot deep galvanized steel).



Covers PKJ

Covers is made from galvanized steel sheet thickness 1,0 mm. Cover is fixed to cable trays by holders ZPN. Tested covers were PKJ100F (hot deep galvanized steel).

Cable clips UKZ1

Cable clips UKO are made from galvanized steel sheet thickness 2,0 mm. Clips UKZ1 are used to gripping cables to mesh trays.

Holders ZM/ZMO

Holders are made from galvanized steel sheet thickness 3,0 mm. Holders are used to gripping ladders to supports.

Spacer BR

Spacer BR55 with dimensions (42 x 140) mm is made of steel sheet 1,5 mm thick and is used as reinforcement in place of fixing of bracket to console.

Threaded rods PG

Threaded rods type PG are made from galvanized steel rods thickness \varnothing 6 mm, \varnothing 8 mm, \varnothing 10 mm or \varnothing 12 mm. Threaded rods are used to gripping supports to ceiling. Tested rods were PGM8 and PGM10.

Support systems KCP/KCOP100H60F, LPP/LPOPH60F, BL/BLO100F, PGJH40F and PKJ100F are made of hot deep galvanized steel.

Other support systems are made of galvanized steel, according to Sendzimir method PN-EN 10346.

Cables

Power cables (N)HXH, (N)HXCH, BiTflame 1000, BITservo FS - safety cables are used in all locations where a special protection against fire and fire damage is necessary for human life and equipment and where strict safety regulations have to be met and where large emergency running time is necessary. They may be used indoor and outdoor, but not directly in earth and water. They are considered as protectively insulated.

Communication cables HTKSH, HTKSHekw, HDGs, HDGsekwf and HLGsekwf – halogen-free fire resistant cables are designed for installation in places where it is necessary to ensure operation of devices under fire conditions. There are recommended for emergency lighting installations, smoke extraction systems, alarm systems, signalling systems, sound warning and control systems, fire alarm signalling and automation and other safety ensuring circuits.

Used cables by test:

Power cables:

(N)HXH 4x1,5RE FE180/E90 0,6/1kV	(24x)
(N)HXH 4x6RE FE180/E90 0,6/1kV	(2x)
(N)HXH 4x50RM FE180/E90 0,6/1kV	(22x)
(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	(2x)
(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV	(2x)
BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	(18x)
BiTflame 1000 4x50RM FE180/E90 0,6/1kV	(18x)
BITservo FS 4G1,5	(4x)
BITservo FS 4G50	(4x)

Communication cables:

HTKSH 1x2x0,8 FE180/PH90/E90 225V	(26x)
HTKSHekwf 1x2x0,8 FE180/PH90/E90 225V	(4x)
HDGs 2x1,0 FE180/PH90/E90 300/500V	(28x)
HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	(4x)
HLGsekwf 2x1,0 FE180/PH90/E90 300/500V	(2x)

The length of cables was 5,2 m and 4,0 m from that was exposed to fire.

Loading with cables and line steel weight with length 400 mm was used as the equivalent load.

More detailed information about product construction is shown in the drawings which form an integral part of test report [1]. Drawings were delivered by sponsor.



3. TEST REPORTS AND EXTENDED APPLICATION REPORTS IN SUPPORT OF CLASSIFICATION

3.1 TEST REPORTS AND EXTENDED APPLICATION REPORTS

No.	Name of laboratory	Name of sponsors	Test report No.	Date of the test	Test method
[1]	Fires s.r.o., Batizovce Slovak Republic	BAKS Kazimierz Sielski Karczew, Poland	FIRES-FR- 285-16-AUNE	08. 12. 2016	STN 92 0205

3.2 TEST RESULTS

Test report No. /Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[1] STN 92 0205	1	2 cables (N)HXH 4x6RE FE180/E90 0,6/1kV	14	39 minutes
	2	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	14	56 minutes
	3	2 cables BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	12	90 minutes no failure / interruption
	4	2 cables BiTflame 1000 4x50RM FE180/E90 0,6/1kV	12	90 minutes no failure / interruption
	5	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	12	90 minutes no failure / interruption
	6	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	12	32 minutes
	7	2 cables BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	11	90 minutes no failure / interruption
	8	2 cables BiTflame 1000 4x50RM FE180/E90 0,6/1kV	11	90 minutes no failure / interruption
	9	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	11	90 minutes no failure / interruption
	10	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	11	77 minutes
	11	2 cables BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	10	44 minutes
	12	2 cables BiTflame 1000 4x50RM FE180/E90 0,6/1kV	10	90 minutes no failure / interruption
	13	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	10	90 minutes no failure / interruption
	14	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	10	90 minutes no failure / interruption
	15	2 cables BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	9	37 minutes
	16	2 cables BiTflame 1000 4x50RM FE180/E90 0,6/1kV	9	90 minutes no failure / interruption
	17	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	9	90 minutes no failure / interruption
	18	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	9	32 minutes
	19	2 cables BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	8	90 minutes no failure / interruption
	20	2 cables BiTflame 1000 4x50RM FE180/E90 0,6/1kV	8	90 minutes no failure / interruption
	21	2 cables (N)HXCH 4x50RM/25 FE180/E90 0,6/1kV	8	90 minutes no failure / interruption
	22	2 cables (N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV	8	72 minutes
	23	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	7	90 minutes no failure / interruption
	24	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	7	90 minutes no failure / interruption
	25	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	13	90 minutes no failure / interruption
	26	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	13	90 minutes no failure / interruption
	27	2 cables BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	6	90 minutes no failure / interruption
	28	2 cables BiTflame 1000 4x50RM FE180/E90 0,6/1kV	6	90 minutes no failure / interruption
	29	2 cables BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	5	90 minutes no failure / interruption
	30	2 cables BiTflame 1000 4x50RM FE180/E90 0,6/1kV	5	90 minutes no failure / interruption
	31	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	5	80 minutes
	32	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	5	90 minutes no failure / interruption
	33	2 cables BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	4	90 minutes no failure / interruption
	34	2 cables BiTflame 1000 4x50RM FE180/E90 0,6/1kV	4	90 minutes no failure / interruption
	35	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	4	90 minutes no failure / interruption
	36	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	4	67 minutes
	37	2 cables BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	3	90 minutes no failure / interruption
	38	2 cables BiTflame 1000 4x50RM FE180/E90 0,6/1kV	3	90 minutes no failure / interruption
	39	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	3	90 minutes no failure / interruption
	40	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	3	43 minutes
	41	2 cables BITservo FS 4G1,5	2	24 minutes
	42	2 cables BITservo FS 4G50	2	61 minutes
	43	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	2	90 minutes no failure / interruption
	44	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	2	90 minutes no failure / interruption



Test report No. /Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[1] STN 92 0205	45	2 cables BITservo FS 4G1,5	1	32 minutes
	46	2 cables BITservo FS 4G50	1	76 minutes
	47	2 cables (N)HXH 4x50RM FE180/E90 0,6/1kV	1	90 minutes no failure / interruption
	48	2 cables (N)HXH 4x1,5RE FE180/E90 0,6/1kV	1	51 minutes
	52A	HTKSH 1x2x0,8 FE180/PH90/E90 225V	12	90 minutes no failure / interruption
	52B	HTKSH 1x2x0,8 FE180/PH90/E90 225V	12	29 minutes
	53A	HDGs 2x1,0 FE180/PH90/E90 300/500V	12	33 minutes
	53B	HDGs 2x1,0 FE180/PH90/E90 300/500V	12	75 minutes
	54A	HTKSH 1x2x0,8 FE180/PH90/E90 225V	11	90 minutes no failure / interruption
	54B	HTKSH 1x2x0,8 FE180/PH90/E90 225V	11	90 minutes no failure / interruption
	55A	HDGs 2x1,0 FE180/PH90/E90 300/500V	11	90 minutes no failure / interruption
	55B	HDGs 2x1,0 FE180/PH90/E90 300/500V	11	90 minutes no failure / interruption
	56A	HTKSH 1x2x0,8 FE180/PH90/E90 225V	10	40 minutes
	56B	HTKSH 1x2x0,8 FE180/PH90/E90 225V	10	41 minutes
	57A	HDGs 2x1,0 FE180/PH90/E90 300/500V	10	72 minutes
	57B	HDGs 2x1,0 FE180/PH90/E90 300/500V	10	71 minutes
	58A	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	9	72 minutes
	58B	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V TEST	8	13 minutes
	59A	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V	9	90 minutes no failure / interruption
	59B	2 cables HTKSHekwf 1x2x0,8 FE180/PH90/E90 225V	9	49 minutes
	60A	2 cables HLGsekwf 2x1,0 FE180/PH90/E90 300/500V	9	27 minutes
	60B	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	9	90 minutes no failure / interruption
	61A	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V	8	90 minutes no failure / interruption
	61B	2 cables HTKSHekwf 1x2x0,8 FE180/PH90/E90 225V	8	90 minutes no failure / interruption
	62A	2 cables HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	8	31 minutes
	62B	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	8	90 minutes no failure / interruption
	63A	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V	7	90 minutes no failure / interruption
	63B	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	7	90 minutes no failure / interruption
	64A	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	13	90 minutes no failure / interruption
	64B	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V	13	90 minutes no failure / interruption
	65A	2 cables HDGs 2x1,0 FE180/PH90/E90 300/500V	6	57 minutes
	65B	2 cables HTKSH 1x2x0,8 FE180/PH90/E90 225V	6	52 minutes
	66A	HTKSH 1x2x0,8 FE180/PH90/E90 225V	5	90 minutes no failure / interruption
	66B	HTKSH 1x2x0,8 FE180/PH90/E90 225V	5	90 minutes no failure / interruption
	67A	HDGs 2x1,0 FE180/PH90/E90 300/500V	5	46 minutes
67B	HDGs 2x1,0 FE180/PH90/E90 300/500V	5	90 minutes no failure / interruption	
68A	HTKSH 1x2x0,8 FE180/PH90/E90 225V	4	90 minutes no failure / interruption	
68B	HTKSH 1x2x0,8 FE180/PH90/E90 225V	4	90 minutes no failure / interruption	
69A	HDGs 2x1,0 FE180/PH90/E90 300/500V	4	48 minutes	
69B	HDGs 2x1,0 FE180/PH90/E90 300/500V	4	50 minutes	
70A	HTKSH 1x2x0,8 FE180/PH90/E90 225V	3	90 minutes no failure / interruption	
70B	HTKSH 1x2x0,8 FE180/PH90/E90 225V	3	90 minutes no failure / interruption	
71A	HDGs 2x1,0 FE180/PH90/E90 300/500V	3	82 minutes	
71B	HDGs 2x1,0 FE180/PH90/E90 300/500V	3	90 minutes no failure / interruption	
72A	HTKSH 1x2x0,8 FE180/PH90/E90 225V	2	90 minutes no failure / interruption	
72B	HTKSH 1x2x0,8 FE180/PH90/E90 225V	2	90 minutes no failure / interruption	
73A	HDGs 2x1,0 FE180/PH90/E90 300/500V	2	90 minutes no failure / interruption	
73B	HDGs 2x1,0 FE180/PH90/E90 300/500V	2	90 minutes no failure / interruption	
74A	HTKSH 1x2x0,8 FE180/PH90/E90 225V	1	47 minutes	
74B	HTKSH 1x2x0,8 FE180/PH90/E90 225V	1	88 minutes	
75A	HDGs 2x1,0 FE180/PH90/E90 300/500V	1	90 minutes no failure / interruption	
75B	HDGs 2x1,0 FE180/PH90/E90 300/500V	1	90 minutes no failure / interruption	

[1] The fire test was discontinued in the 94th minute at the request of test sponsor.

Specimens S1 – S48 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W. Specimens S52 – S75 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W. Circuit breakers with rating 3 A and performance characteristics B(gL) were used.



4. CLASSIFICATION AND FIELD OF APPLICATION

4.1 CLASSIFICATION ACCORDING TO DIN 4102-12: 1998-11

The element, cable bearing system BAKS – cable trays KBL, KCP/KCOP, KFJ, KGJ/KGOJ, cable mesh trays KDSO with clips UKZ1, cable ladders DUP, DFP and accessories (consoles WPCB, supports CMP, CTMT, hangers WKS/WKSO, WPPGV/WPPOV, brackets WWS/WWSO, holders ZM/ZMO, threaded rods PG, etc.) with power and communication non-halogen cables business Zakłady Kablowe BITNER, type (N)HXH, (N)HXCH, BiTflame 1000, BITservo FS, HTKSH, HTKSHekw, HDGs, HDGsekwf and HLGsekwf with circuit integrity maintenance in fire is classified according to the following combinations of performance parameters and classes as appropriate.

Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	In cable trays KFJ400H60. Consoles combined of support CMP41H21/05 and two threaded rods PGM10. Consoles fixed to tube segments ¹⁾ by hangers WPPGV/WPPOV, collars (Ø 110) and screws SMM10x20. Loading 12 kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard track No. 1.	E 30	n x ≥ 1,5 mm ² n ≥ 2	
	(N)HXH 4x50RM FE180/E90 0,6/1kV		E 90	E 30	
BITservo FS FE180/E90	BITservo FS 4G1,5 FE180/E90		E 30	n x ≥ 1,5 mm ² n ≥ 2	
	BITservo FS 4G50 FE180/E90		E 60	E 30	
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V		E 30	n x 2 x ≥ 0,8 mm n ≥ 2	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V		E 90	n x ≥ 1,0 mm ² n ≥ 2	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV		In cable ladders DFP400H60. Consoles combined of support CMP41H21/05 and two threaded rods PGM10. Consoles fixed to tube segments ¹⁾ by hangers WPPGV/WPPOV, collars (Ø 110) and screws SMM10x20. Loading 12 kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard track No. 2.	E 90	n x ≥ 1,5 mm ² n ≥ 2
	(N)HXH 4x50RM FE180/E90 0,6/1kV			E 90	E 90
BITservo FS FE180/E90	BITservo FS 4G1,5 FE180/E90			Without classification	Without classification
	BITservo FS 4G50 FE180/E90			E 60	
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V	E 90		n x 2 x ≥ 0,8 mm n ≥ 2	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V	E 90		n x ≥ 1,0 mm ² n ≥ 2	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	In cable trays KGJ400H60 and cable ladders DUP400H60. Consoles combined of support CMP41H41/06 and two threaded rods PGM8. Loading 20 kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard track No. 3.		E 30	n x ≥ 1,5 mm ² n ≥ 2
	(N)HXH 4x50RM FE180/E90 0,6/1kV			E 90	E 30
BiTflame 1000 FE180/E90 0,6/1kV	BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV			E 90	n x ≥ 1,5 mm ² n ≥ 2
	BiTflame 1000 4x50RM FE180/E90 0,6/1kV			E 90	E 90
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V		E 90	n x 2 x ≥ 0,8 mm n ≥ 2	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V		E 60	n x ≥ 1,0 mm ² n ≥ 2	

¹⁾ Supporting constructions were made of four tube segments approx. 600 mm long (Ø 110 mm, wall thickness 1,8 mm). Individual segments were placed transversely and fixed to ceiling by threaded rods PGM10 (4 pcs per segment) through panels in spacing of 1500 mm.



Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	In cable trays KFJ400H60. Consoles combined of support CMP41H21/05 and two threaded rods PGM10. Consoles fixed to tube segments ²⁾ by support CMP41H41/05, two threaded rods PGM10, hangers PPGV/WPPOV, collars (Ø 110) and screws SMM10x40. Loading 12 kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard track No. 4.	E 60	n x ≥ 1,5 mm ² n ≥ 2 E 60	
	(N)HXH 4x50RM FE180/E90 0,6/1kV		E 90		
BiTflame 1000 FE180/E90 0,6/1kV	BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV		E 90	n x ≥ 1,5 mm ² n ≥ 2 E 90	
	BiTflame 1000 4x50RM FE180/E90 0,6/1kV		E 90		
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V		E 90	n x 2 x ≥ 0,8 mm n ≥ 2 E 90	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V		E 30	n x ≥ 1,0 mm ² n ≥ 2 E 30	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV		In cable ladders DFP400H60. Consoles combined of support CMP41H21/05 and two threaded rods PGM10. Consoles fixed to tube segments ²⁾ by support CMP41H41/05, two threaded rods PGM10, hangers PPGV/WPPOV, collars (Ø 110) and screws SMM10x40. Loading 12 kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard track No. 5.	E 90	n x ≥ 1,5 mm ² n ≥ 2 E 60
	(N)HXH 4x50RM FE180/E90 0,6/1kV			E 60	
BiTflame 1000 FE180/E90 0,6/1kV	BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV			E 90	n x ≥ 1,5 mm ² n ≥ 2 E 90
	BiTflame 1000 4x50RM FE180/E90 0,6/1kV			E 90	
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V	E 90		n x 2 x ≥ 0,8 mm n ≥ 2 E 90	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V	E 30		n x ≥ 1,0 mm ² n ≥ 2 E 30	
BiTflame 1000 FE180/E90 0,6/1kV	BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV	In cable trays KBL300H60. Consoles combined of support CMP41H21/05 and two threaded rods PGM8. Loading 12 kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard track No. 6.		E 90	n x ≥ 1,5 mm ² n ≥ 2 E 90
	BiTflame 1000 4x50RM FE180/E90 0,6/1kV			E 90	
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V			E 30	n x 2 x ≥ 0,8 mm n ≥ 2 E 30
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V			E 30	n x ≥ 1,0 mm ² n ≥ 2 E 30

²⁾ Supporting constructions were made of four tube segments approx. 250 mm long (Ø 110 mm, wall thickness 1,8 mm). Individual segments were placed longitudinal and fixed to ceiling by threaded rods PGM10 (4 pcs per segment) through panels in spacing of 1500 mm.



Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	In cable ladders DFP300H60. Consoles WPCB500 with brackets WWS/WWSO300 and spacers BR55. Loading 10 kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard track No. 7.	E 90	n x ≥ 1,5 mm ² n ≥ 2 E 90	
	(N)HXH 4x50RM FE180/E90 0,6/1kV		E 90		
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V		E 90	n x 2 x ≥ 0,8 mm n ≥ 2 E 90	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V		E 90	n x ≥ 1,0 mm ² n ≥ 2 E 90	
(N)HXCH FE180/E90 0,6/1kV	(N)HXCH 4x1,5RE/1,5 FE180/E90 0,6/1kV		In cable ladder DUP600H60. Consoles combined of supports CMP41H41/07 and two threaded rods PGM10. Loading 30 kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard track No. 8.	E 60	n x ≥ 1,5/1,5 mm ² n ≥ 2 E 60
	(N)HXCH 4x50RM/25 FE180/E90 0,6/1kV			E 90	
BiTflame 1000 FE180/E90 0,6/1kV	BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV			E 90	n x ≥ 1,5 mm ² n ≥ 2 E 90
	BiTflame 1000 4x50RM FE180/E90 0,6/1kV			E 90	
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V			E 90	n x 2 x ≥ 0,8 mm n ≥ 2 E 90
HTKSHekwf FE180/PH90/ E90 225V	HTKSHekwf 1x2x0,8 FE180/PH90/E90 225V			E 90	n x 2 x ≥ 0,8 mm n ≥ 2 E 90
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V	E 90		n x ≥ 1,0 mm ² n ≥ 2 E 90	
HDGsekwf FE180/PH90/ E90 300/500V	HDGsekwf 2x1,0 FE180/PH90/E90 300/500V	E 30		n x ≥ 1,0 mm ² n ≥ 2 E 30	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	In cable trays KCP/KCOP600H60. Consoles combined of supports CMP41H41/07 and two threaded rods PGM10. Loading 25 kg.m ⁻¹ . Consoles in spacing of 1500 mm. Non-standard track No. 9.		E 30	n x ≥ 1,5 mm ² n ≥ 2 E 30
	(N)HXH 4x50RM FE180/E90 0,6/1kV			E 90	
BiTflame 1000 FE180/E90 0,6/1kV	BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV		E 30	n x ≥ 1,5 mm ² n ≥ 2 E 30	
	BiTflame 1000 4x50RM FE180/E90 0,6/1kV		E 90		
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V		E 90	n x 2 x ≥ 0,8 mm n ≥ 2 E 90	
HTKSHekwf FE180/PH90/ E90 225V	HTKSHekwf 1x2x0,8 FE180/PH90/E90 225V		E 30	n x 2 x ≥ 0,8 mm n ≥ 2 E 30	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V		E 60	n x ≥ 1,0 mm ² n ≥ 2 E 60	
HDGsekwf FE180/PH90/ E90 300/500V	HDGsekwf 2x1,0 FE180/PH90/E90 300/500V		E 90	n x ≥ 1,0 mm ² n ≥ 2 E 90	
HLGsekwf FE180/PH90/ E90 300/500V	HLGsekwf 2x1,0 FE180/PH90/E90 300/500V		Without classification	Without classification	



Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	In cable trays KCP/KCOP400H60. Consoles combined of supports CMP41H41/05 and two threaded rods PGM10. Loading 20 kg.m ⁻¹ . Consoles in spacing of 1700 mm. Non-standard track No. 10.	E 90	n x ≥ 1,5 mm ² n ≥ 2 E 90	
	(N)HXH 4x50RM FE180/E90 0,6/1kV		E 90		
BiTflame 1000 FE180/E90 0,6/1kV	BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV		E 30	n x ≥ 1,5 mm ² n ≥ 2 E 30	
	BiTflame 1000 4x50RM FE180/E90 0,6/1kV		E 90		
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V		E 30	n x 2 x ≥ 0,8 mm n ≥ 2 E 30	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V		E 60	n x ≥ 1,0 mm ² n ≥ 2 E 60	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV		In cable ladder DUP400H60. Consoles combined of supports CMP41H41/05 and two threaded rods PGM10. Loading 20 kg.m ⁻¹ . Consoles in spacing of 1700 mm. Non-standard track No. 11.	E 60	n x ≥ 1,5 mm ² n ≥ 2 E 60
	(N)HXH 4x50RM FE180/E90 0,6/1kV			E 90	
BiTflame 1000 FE180/E90 0,6/1kV	BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV			E 90	n x ≥ 1,5 mm ² n ≥ 2 E 90
	BiTflame 1000 4x50RM FE180/E90 0,6/1kV			E 90	
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V	E 90		n x 2 x ≥ 0,8 mm n ≥ 2 E 90	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V	E 90		n x ≥ 1,0 mm ² n ≥ 2 E 90	
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	In cable ladder DUP400H60. Consoles combined of supports CMP41H41/05 and two threaded rods PGM10. Consoles in spacing of 1200 mm. Central console combined of two longitudinal supports CTMT40H60/2,3 and two transverse supports CMP41H41/05 in spacing of 1200 mm and two threaded rods PGM10. Supports CTMT40H60/2,3 fixed to ceiling in spacing of 2200 mm. Loading 20 kg.m ⁻¹ . Non-standard track No. 12.		E 30	n x ≥ 1,5 mm ² n ≥ 2 E 30
	(N)HXH 4x50RM FE180/E90 0,6/1kV			E 90	
BiTflame 1000 FE180/E90 0,6/1kV	BiTflame 1000 4x1,5RE FE180/E90 0,6/1kV			E 90	n x ≥ 1,5 mm ² n ≥ 2 E 90
	BiTflame 1000 4x50RM FE180/E90 0,6/1kV			E 90	
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V		Without classification	Without classification	
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V		E 30	n x ≥ 1,0 mm ² n ≥ 2 E 30	



Cable	Type of tested cable, single cross-sections and number of conductors	Arrangement	Classification for type of tested cable (by cross-sections and number of conductors)	Classification for cable
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	In cable mesh tray KDS/KDSO60H60 fixed to ceiling at upside down position by hangers WKS/WKSO60 in spacing of 1500 mm. Cables fixed to mesh trays by cable clamps UKZ1/UKZO1 in spacing of 600 mm. Loading 2,8 kg.m ⁻¹ . Non-standard track No. 13.	E 90	n x ≥ 1,5 mm ² n ≥ 2 E 90
	(N)HXH 4x50RM FE180/E90 0,6/1kV		E 90	
HTKSH FE180/PH90/ E90 225V	HTKSH 1x2x0,8 FE180/PH90/E90 225V		E 90	n x 2 x ≥ 0,8 mm n ≥ 2 E 90
HDGs FE180/PH90/ E90 300/500V	HDGs 2x1,0 FE180/PH90/E90 300/500V		E 90	n x ≥ 1,0 mm ² n ≥ 2 E 90
(N)HXH FE180/E90 0,6/1kV	(N)HXH 4x1,5RE FE180/E90 0,6/1kV	In cable trays KCP/KCOP100H60F with partitions PGJH40F and covers PKJ100F. Brackets WWCT100F. Wall mounting. Loading 20 kg.m ⁻¹ . Brackets in spacing of 1500 mm. Non-standard track No. 14.	E 30	n x 1,5 - 6 mm ² n ≥ 2 E 30
	(N)HXH 4x6RE FE180/E90 0,6/1kV		E 30	

The element, cable bearing system BAKS – cable trays KBL, KCP/KCOP, KFJ, KGJ/KGOJ, cable mesh trays KDSO with clips UKZ1, cable ladders DUP, DFP and accessories (consoles WPCB, supports CMP, CTMT, hangers WKS/WKSO, WPPGV/WPPOV, brackets WWS/WWSO, holders ZM/ZMO, threaded rods PG, etc.) with power and communication non-halogen cables business Zaklady Kablowe BITNER, type (N)HXH, (N)HXCH, BiTflame 1000, BITservo FS, HTKSH, HTKSHekw, HDGs, HDGsekwf and HLGsekwf with circuit integrity maintenance in fire is classified to classes according to achieved test results of tested cables at tracks. Other classification is not allowed.



4.2 FIELD OF APPLICATION

This classification is valid for the following end use applications:

- throughout the period during which circuit integrity is to be maintained, neighboring building components shall not have a negative effect on circuit integrity;
- although testing is only carried out on cables arranged horizontally, test results also apply to cables arranged either diagonally or vertically (e.g. in risers), as long as the cable system is supported in transitional areas (i.e. where it switches from a horizontal to a vertical arrangement) in such a manner that the cables will not slip or kink at corners;
- test results of function in fire test of cables tested at standard supporting construction are also applicable for tested standard supporting construction of other producers;
- test results of function in fire test of cables tested at standard supporting construction are also applicable for cables of other producers tested at standard supporting construction;
- where risers are used, circuit integrity classification only applies if the cable is effectively supported (i.e. with a spacing of supports of 3 500 mm or less). Figure 5 of standard DIN 4102-12 shows a suitable means of mounting cables on risers. Cables may also be stabilized by a seal at penetrations in floors, provided that the sealant material is of a suitable material class, or using clips of proven suitability. The suitability of any design other than that shown in figure 5 may only be assessed by an accredited testing laboratory;
- for vertical systems, the test results obtained for cables mounted singly on the ceiling using single clips apply. Brackets of proven suitability may also be used, as long as their spacing is equal to that of the single clips tested;
- test results of testing single cables on the ceiling apply also to cables mounted horizontally on walls;
- test results of testing bunched cables on a ladder or tray also apply to support construction attached to a wall. However, such constructions required proof of suitability by means of a test certificate or other document issued by an accredited testing laboratory;
- test results are applicable only for systems without connection elements (e.g. junction box, branch bar);
- **classification for type of cable (by cross-sections and number of conductors) is valid only for tested cable types, number and cross-sections of conductors;**
- **classification for cable is valid for all numbers and cross-sections of tested cable type;**
- **test results of function in fire test of cables at non-standard supporting construction are valid only for tested construction with particular tested cable type and are also applicable for supporting construction with smaller spacing of consoles and smaller loading;**
- **test results of cables tested at cable trays or ladders are applicable also for another products trays and ladders (cross, elbow, T-bend, bends and etc.).**

5. LIMITATIONS

Load-bearing construction elements for fixing of cable systems must be proved for at least the same fire resistance compare to classified function in fire of cable system.

The construction contractor is solely responsible for proper preparation.

This classification document does not represent type approval or certification of the product.

The classification is valid until 03. 03. 2022 provided that the product, field of application and standards and regulations are not changed.

Approved:

Ing. Štefan Rástocký
leader of the testing laboratory



Signed:

Miroslav Hudák
technician of the testing laboratory