CLASSIFICATION OF FUNCTION IN FIRE
FIRES-CR-067-16-AUPE

Power and communications cables TECHNOKABEL, type – NHXH, NHXCH, HTKSH and HTKSHekw

Reg. No. 041/S-159

The Experts on Fire Safety

CLASSIFICATION OF FUNCTION IN FIRE IN ACCORDANCE WITH DIN 4102-12: 1998-11

with direct field of application

FIRES-CR-067-16-AUPE

Name of the product:	Power and communications cables TECHNOKABEL, type – NHXH, NHXCH, HTKSH and HTKSHekw
Sponsor:	TECHNOKABEL S.A. ul. Nasielska 55 04-343 Warszawa Poland
Prepared by:	FIRES, s.r.o. Osloboditeľov 282 059 35 Batizovce Slovak Republic
Tested property:	Function in fire
Test method:	DIN 4102 – 12
Type of test:	Accredited
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1. INTRODUCTION

This classification report defines the function in fire classification assigned to element Power and communications cables TECHNOKABEL, type – NHXH, NHXCH, HTKSH and HTKSHekw at cable bearing system BAKS in accordance with the procedures given in DIN 4102-12: 1998-11.

This products have already been classified by FIRES, s.r.o. and number of previous classification of function in fire is FIRES-CR-178-06-AUPE, issued on 08. 12. 2006 with validity until 08. 12. 2011.

2. DETAILS OF CLASSIFIED PRODUCT

2.1 GENERAL

The element, Power and communications cables TECHNOKABEL, type – NHXH, NHXCH, HTKSH and HTKSHekw at cable bearing system BAKS, is defined as a power and communication cables with integrity maintenance in case of fire.

2.2 PRODUCT DESCRIPTION

Product comprised from fire resistant halogen free power and communication cables at cable bearing system.

Power cables NHXH, NHXCH - fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).
Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.
Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during firefighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive. The cables are suitable for indoor and outdoor installations.

Communication cables HTKSH, HTKSHekw – fire resistant and halogen free cables are intended for installation in alarm, signalling, transmission, sound warning and similar systems, also for data processing systems and for analogue or digital data transmission in industrial electronics and control applications in objects of sharp fire protection requirements, particularly in fire alarm and fire automatic control systems.
Halogen free cables are applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.
Functions of the cables are maintained – data are transmitted and power is supplied to equipment which must operate in fire conditions and during firefighting (e.g. emergency lighting). The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

Used cables and cable bearing system by test:

Used cables by test:	NHXH PH90/E30-E90 4x1,5 RE 0,6/1 kV MICA	(14 x)
	NHXH PH90/E30-E90 4x50 RM 0,6/1 kV MICA	(8 x)
	NHXCH PH90/E30-E90 4x1,5/1,5 RE 0,6/1 kV MICA	(12 x)
	NHXCH PH90/E30-E90 4x50/25 RM 0,6/1 kV MICA	(6 x)
	HTKSH PH90/E30 4x2x0,8 MICA	(12 x)
	HTKSHekw PH90/E30 1x2x2,3 MICA	(10 x)

Used bearing systems by tests:
Bearing system BAKS – cable trays KCOP, cable ladders DGOP, ceiling ledges SDOC with clips UKO1, clips UDF, UEF, cable holder OZMO and OZO with accessories (consoles, booms, hangers, threaded rods, dowels etc.). Producer BAKS Kazimierz Sielski, Poland.

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

3. TEST REPORTS IN SUPPORT OF CLASSIFICATION

3.1 TEST REPORTS

No.	Name of laboratory	Name of sponsors	Test report No.	Date of the test	Test method
[1]	Fires s.r.o., Batizovce, SR	TECHNOKABEL S.A., Warszawa, Poland	FIRES-FR-160-06-AUNE	16. 11. 2006	DIN 4102 – 12: 1998-11

3.2 TEST RESULTS

Test report No. /Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[1] DIN 4102-12	1	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	9	90 minutes no failure / interruption
	2	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	9	90 minutes no failure / interruption
	3	NHXH PH90/E30-E90 4x1,5 RE MICA	9	90 minutes no failure / interruption
	4	NHXH PH90/E30-E90 4x1,5 RE MICA	9	90 minutes no failure / interruption
	5	NHXCH PH90/E30-E90 4x50/25 RM MICA	9	90 minutes no failure / interruption
	6	NHXCH PH90/E30-E90 4x50/25 RM MICA	9	90 minutes no failure / interruption
	7	NHXH PH90/E30-E90 4x50 RM MICA	9	90 minutes no failure / interruption
	8	NHXH PH90/E30-E90 4x50 RM MICA	9	90 minutes no failure / interruption
	9	NHXH PH90/E30-E90 4x50 RM MICA	8	90 minutes no failure / interruption
	10	NHXH PH90/E30-E90 4x50 RM MICA	8	90 minutes no failure / interruption
	11	NHXH PH90/E30-E90 4x1,5 RE MICA	8	90 minutes no failure / interruption
	12	NHXH PH90/E30-E90 4x1,5 RE MICA	8	90 minutes no failure / interruption
	13	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	7	90 minutes no failure / interruption
	14	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	7	90 minutes no failure / interruption
	15	NHXH PH90/E30-E90 4x1,5 RE MICA	7	90 minutes no failure / interruption
	16	NHXH PH90/E30-E90 4x1,5 RE MICA	7	90 minutes no failure / interruption
	17	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	6	90 minutes no failure / interruption
	18	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	6	90 minutes no failure / interruption
	19	NHXH PH90/E30-E90 4x1,5 RE MICA	6	90 minutes no failure / interruption
	20	NHXH PH90/E30-E90 4x1,5 RE MICA	6	90 minutes no failure / interruption
	21	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	5	90 minutes no failure / interruption
	22	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	5	90 minutes no failure / interruption
	23	NHXH PH90/E30-E90 4x1,5 RE MICA	5	90 minutes no failure / interruption
	24	NHXH PH90/E30-E90 4x1,5 RE MICA	5	90 minutes no failure / interruption
	25	NHXH PH90/E30-E90 4x1,5 RE MICA	2	90 minutes no failure / interruption
	26	NHXH PH90/E30-E90 4x1,5 RE MICA	2	90 minutes no failure / interruption
	27	NHXH PH90/E30-E90 4x50 RM MICA	2	90 minutes no failure / interruption
	28	NHXH PH90/E30-E90 4x50 RM MICA	2	90 minutes no failure / interruption
	29	NHXH PH90/E30-E90 4x1,5 RE MICA	1	90 minutes no failure / interruption
	30	NHXH PH90/E30-E90 4x1,5 RE MICA	1	90 minutes no failure / interruption
	31	NHXH PH90/E30-E90 4x50 RM MICA	1	90 minutes no failure / interruption
	32	NHXH PH90/E30-E90 4x50 RM MICA	1	90 minutes no failure / interruption
	33	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	4	90 minutes no failure / interruption
	34	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	4	90 minutes no failure / interruption
	35	NHXCH PH90/E30-E90 4x50/25 RM MICA	4	90 minutes no failure / interruption
	36	NHXCH PH90/E30-E90 4x50/25 RM MICA	4	90 minutes no failure / interruption
	37	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	3	90 minutes no failure / interruption
	38	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA	3	90 minutes no failure / interruption
	39	NHXCH PH90/E30-E90 4x50/25 RM MICA	3	90 minutes no failure / interruption
	40	NHXCH PH90/E30-E90 4x50/25 RM MICA	3	90 minutes no failure / interruption
	41	HTKSHekw PH90/E30 1x2x2,3 MICA	9	62 minutes
	42	HTKSHekw PH90/E30 1x2x2,3 MICA	9	75 minutes
	43	HTKSH PH90/E30 4x2x0,8 MICA	9	75 minutes
	44	HTKSH PH90/E30 4x2x0,8 MICA	9	75 minutes

Test report No. /Test method	Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
[1] DIN 4102-12	45	HTKSHekw PH90/E30 1x2x2,3 MICA	7	47 minutes
	46	HTKSHekw PH90/E30 1x2x2,3 MICA	7	62 minutes
	47	HTKSH PH90/E30 4x2x0,8 MICA	7	90 minutes no failure / interruption
	48	HTKSH PH90/E30 4x2x0,8 MICA	7	90 minutes no failure / interruption
	49	HTKSHekw PH90/E30 1x2x2,3 MICA	6	71 minutes
	50	HTKSHekw PH90/E30 1x2x2,3 MICA	6	76 minutes
	51	HTKSH PH90/E30 4x2x0,8 MICA	6	32 minutes
	52	HTKSH PH90/E30 4x2x0,8 MICA	6	32 minutes
	53	HTKSH PH90/E30 4x2x0,8 MICA	5	90 minutes no failure / interruption
	54	HTKSH PH90/E30 4x2x0,8 MICA	5	67 minutes
	55	HTKSH PH90/E30 4x2x0,8 MICA	2	74 minutes
	56	HTKSH PH90/E30 4x2x0,8 MICA	2	83 minutes
	57	HTKSH PH90/E30 4x2x0,8 MICA	1	90 minutes no failure / interruption
	58	HTKSH PH90/E30 4x2x0,8 MICA	1	90 minutes no failure / interruption
	59	HTKSHekw PH90/E30 1x2x2,3 MICA	4	73 minutes
	60	HTKSHekw PH90/E30 1x2x2,3 MICA	4	56 minutes
	61	HTKSHekw PH90/E30 1x2x2,3 MICA	3	90 minutes no failure / interruption
	62	HTKSHekw PH90/E30 1x2x2,3 MICA	3	90 minutes no failure / interruption

[1] The test was discontinued in 102nd minute at the request of test sponsor.

Specimens S1 – S40 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Specimens S41 – S62 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.
Circuit breakers with rating 3 A were used.

4. CLASSIFICATION AND FIELD OF APPLICATION

4.1 REFERENCE OF CLASSIFICATION

This classification has been carried out in accordance with clause 3.2 of DIN 4102 – 12: 1998-11.

4.2 CLASSIFICATION

The element, Power and communications cables TECHNOKABEL, type – NHXH, NHXCH, HTKSH and HTKSHekw at cable bearing system BAKS - cable trays KCOP, cable ladders DGOP, ceiling ledges SDOC with clips UKO1, clips UDF, UEF, cable holder OZMO and OZO with accessories (consoles, booms, hangers, threaded rods, dowels etc.) is classified according to the following combinations of performance parameters and classes as appropriate.

Used cables by test [1] are classified as follows:

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
NHXH PH90/E30-E90 MICA	NHXH PH90/E30-E90 4x1,5 RE MICA	Cable trays KCOP 300H60/3N. Consoles WPCE 800 fixed by dowels PSRO M10x80. Booms WMCO 300 with holders UPWO and threaded rods PGM10 with holders USOV. Consoles in spacing of 1200 mm. Loading 10 kg.m^{-1}. **Track No. 1 and 3.**	**E 90**	n x ≥1,5 mm^2 n ≥ 2 **E 90**
	NHXH PH90/E30-E90 4x50 RM MICA		**E 90**	
NHXCH PH90/E30-E90 MICA	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA		**E 90**	n x ≥1,5/1,5 mm^2 n ≥ 2 **E 90**
	NHXCH PH90/E30-E90 4x50/25 RM MICA		**E 90**	

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
HTKSH PH90/E30 MICA	HTKSH PH90/E30 4x2x0,8 MICA	Cable trays KCOP 300H60/3N. Consoles WPCE 800 fixed by dowels PSRO M10x80. Booms WMCO 300 with holders UPWO and threaded rods PGM10 with holders USOV. Consoles in spacing of 1200 mm. Loading 10 kg.m^{-1}. **Track No. 1 and 3.**	**E 90**	n x 2 x ≥ 0,8 mm n ≥ 4 **E 90**
HTKSHekw PH90/E30 MICA	HTKSHekw PH90/E30 1x2x2,3 MICA		**E 90**	n x 2 x ≥ 2,3 mm n ≥ 1 **E 90**
NHXH PH90/E30-E90 MICA	NHXH PH90/E30-E90 4x1,5 RE MICA	Cable ladders DGOP 400H60/3N. Consoles WPCE 800 fixed by dowels PSRO M10x80. Booms WMCO 400 with holders UPWO and threaded rods PGM10 with holders USOV. Consoles in spacing of 1200 mm. Loading 20 kg.m^{-1}. **Track No. 2 and 4.**	**E 90**	n x ≥1,5 mm^2 n ≥ 2 **E 90**
	NHXH PH90/E30-E90 4x50 RM MICA		**E 90**	
NHXCH PH90/E30-E90 MICA	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA		**E 90**	n x ≥1,5/1,5 mm^2 n ≥ 2 **E 90**
	NHXCH PH90/E30-E90 4x50/25 RM MICA		**E 90**	
HTKSH PH90/E30 MICA	HTKSH PH90/E30 4x2x0,8 MICA		**E 60**	n x 2 x ≥ 0,8 mm n ≥ 4 **E 60**
HTKSHekw PH90/E30 MICA	HTKSHekw PH90/E30 1x2x2,3 MICA		**E 30**	n x 2 x ≥ 2,3 mm n ≥ 1 **E 30**
NHXH PH90/E30-E90 MICA	NHXH PH90/E30-E90 4x1,5 RE MICA	Cable clips UEF fixed by dowels SRO M6x30. Clips in spacing of 300 mm. Ceiling mounting. **Track No. 5.**	**E 90**	**Without classification**
NHXCH PH90/E30-E90 MICA	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA		**E 90**	**Without classification**
HTKSH PH90/E30 MICA	HTKSH PH90/E30 4x2x0,8 MICA		**E 60**	n x 2 x ≥ 0,8 mm n ≥ 4 **E 60**
NHXH PH90/E30-E90 MICA	NHXH PH90/E30-E90 4x1,5 RE MICA	Cable clips UDF fixed by dowels SRO M6x30. Clips in spacing of 300 mm. Ceiling mounting. **Track No. 6.**	**E 90**	**Without classification**
NHXCH PH90/E30-E90 MICA	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA		**E 90**	**Without classification**
HTKSH PH90/E30 MICA	HTKSH PH90/E30 4x2x0,8 MICA		**E 30**	n x 2 x ≥ 0,8 mm n ≥ 4 **E 30**
HTKSHekw PH90/E30 MICA	HTKSHekw PH90/E30 1x2x2,3 MICA		**E 60**	n x 2 x ≥ 2,3 mm n ≥ 1 **E 60**
NHXH PH90/E30-E90 MICA	NHXH PH90/E30-E90 4x1,5 RE MICA	Cable holders OZMO Holders fixed by dowels SRO M6x30. Holders in spacing of 300 mm. Ceiling mounting. **Track No. 7.**	**E 90**	**Without classification**
NHXCH PH90/E30-E90 MICA	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA		**E 90**	**Without classification**
HTKSH PH90/E30 MICA	HTKSH PH90/E30 4x2x0,8 MICA		**E 90**	n x 2 x ≥ 0,8 mm n ≥ 4 **E 90**
HTKSHekw PH90/E30 MICA	HTKSHekw PH90/E30 1x2x2,3 MICA		**E 30**	n x 2 x ≥ 2,3 mm n ≥ 1 **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
NHXH PH90/E30-E90 MICA	NHXH PH90/E30-E90 4x1,5 RE MICA	Cable holders OZO Holders fixed by dowels SRO M6x30. Holders in spacing of 600 mm. Ceiling mounting. **Track No. 8.**	**E 90**	n x ≥1,5 mm^2 n ≥ 2 **E 90**
	NHXH PH90/E30-E90 4x50 RM MICA		**E 90**	
NHXH PH90/E30-E90 MICA	NHXH PH90/E30-E90 4x1,5 RE MICA	Cable clips UKO1 in the ledges SDOC 600. Ledges fixed by dowels PSRO M8x75. Clips and ledges in spacing of 300 mm. Ceiling mounting. **Track No. 9.**	**E 90**	n x ≥1,5 mm^2 n ≥ 2 **E 90**
	NHXH PH90/E30-E90 4x50 RM MICA		**E 90**	
NHXCH PH90/E30-E90 MICA	NHXCH PH90/E30-E90 4x1,5/1,5 RE MICA		**E 90**	n x ≥1,5/1,5 mm^2 n ≥ 2 **E 90**
	NHXCH PH90/E30-E90 4x50/25 RM MICA		**E 90**	
HTKSH PH90/E30 MICA	HTKSH PH90/E30 4x2x0,8 MICA		**E 60**	n x 2 x ≥ 0,8 mm n ≥ 4 **E 60**
HTKSHekw PH90/E30 MICA	HTKSHekw PH90/E30 1x2x2,3 MICA		**E 60**	n x 2 x ≥ 2,3 mm n ≥ 1 **E 60**

The element, Power and communications cables TECHNOKABEL, type – NHXH, NHXCH, HTKSH and HTKSHekw at cable bearing system BAKS - cable trays KCOP, cable ladders DGOP, ceiling ledges SDOC with clips UKO1, clips UDF, UEF, cable holder OZMO and OZO with accessories (consoles, booms, hangers, threaded rods, dowels etc.) are classified to classes according to achieved test results of tested cables at tracks. Other classification is not allowed.

4.3 FIELD OF APPLICATION

This classification is valid for the following end use applications:

- § throughout the period during which circuit integrity is to be maintained, neighbouring building components shall not have a negative effect on circuit integrity;
- § 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;
- § although testing is only carried out on cables arranged horizontally, test results also apply to cables arranged either diagonally or vertically (e.g. 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;
- § test results of function in fire test of cables at nonstandard 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 in cable trays or ladders are applicable also for cable trays and ladders with particular construction with smaller width as tested with particular 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.);

- § maximal length of increasing routing shall be 3500 mm with consistent horizontal placing of cable with minimal length of 300 mm (apart from cable bending) and with maximal spacing of clips of 300 mm, eventually the cables are stabilized by cable transmissions at floor or ceiling with particular fire resistance;
- § 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;
- § results of testing single cables on the ceiling apply also to cables mounted horizontally on walls;
- § 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).

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 provided that the product, field of application and standards and regulations are not changed.

Approved:

Ing. Štefan Rástocký
leader of the testing laboratory

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-1-

Signed:

Miroslav Hudák
technician of the testing laboratory