FIRE RESISTANCE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION FIRES-JR-024-08-NURE

Cable bearing system BAKS

FIRES 004/S2-19/10/2007-E-el

FIRE RESISTANCE EXPERT JUDGEMENT REPORT WITH CLASSIFICATION

Product name: *Cable bearing system BAKS*

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1. Introduction

This expert judgement report with classification defines the resistance to fire classification assigned to element Cable bearing system BAKS in accordance with the classes given in DIN 4102 – 12: 1998-11.

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 relevant extended application standard. This expert judgement express 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, is defined as a bearing system according to DIN 4102 – 12: 1998-11.

2.2 Product description

Product comprised from cable bearing systems BAKS with accessories – cable trays, cable ladders, basket cable trays, ceiling ledges SDOC with clips UKO1, clips UEF, UDF and power and communication non-halogen cables business TECHNOKABEL.

Cables:	(N)HXH 4x1,5 RE FE180 PH30/E30-E60	(2 x)
	(N)HXH 4x50 RM FE180 PH30/E30-E60	(6 x)
	(N)HXCH 4x1,5/1,5 RE FE180 PH30/E30-E60	(2 x)
	(N)HXCH 4x50/25 RM FE180 PH30/E30-E60	(6 x)
	(N)HXH 4x1,5 RE FE180 PH90/E90	(10 x)
	(N)HXH 4x50 RM FE180 PH90/E90	(2 x)
	(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	(6 x)
	(N)HXCH 4x50/25 RM FE180 PH90/E90	(2 x)
	HTKSH 1x2x0,8 FE180 PH90/E30-E90	(12 x)
	HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	(6 x)

Ceiling installation: was made by ceiling ledges (type SDOC 600) and cable clips (type UEF, UDF). Ceiling ledges were fixed to ceiling by three dowels (type PRSO M8x75) in spacing of 600 mm. Cables were fixed to ledges by clips (type UKO1) in spacing of 600 mm. Cable clips (type UEF, UDF) depending on the diameter of cable were fixed to ceiling by dowels (type SRO M6x30) in spacing of 600 mm.
Suspension track No. 1: was made of three consoles combined of two horizontal supports (type CWOP40H40/05) and two threaded bar M10x600 with washers and nuts M10 and two hangers (type USOV) which were fixed to ceiling by dowels (type PRSO M8x75) in spacing of 1200 mm. Basket cable trays (type KDSO400H60) were fixed to horizontal supports. Load-bearing system was loaded with 20 kg/m.
Suspension track No. 2: was made of three consoles combined of horizontal support (type CWOP40H40/05) and two threaded bar M8x300 with washers and nuts M8 and two hangers (type ZK8) which were fixed to steel profiles I 80. These profiles were fixed to ceiling by four dowels (type PRSO M8x75) in spacing of 1200 mm. Basket cable trays (type KDSO400H60) were fixed to horizontal supports. Load-bearing system was loaded with 10 kg/m.
Suspension track No. 3: was made of four consoles (type WKSO60) which were fixed to ceiling by dowels (type SRO M6x30) in spacing of 1200 mm. Basket cable trays (type KDSO60H60) were fixed to consoles. Load-bearing system was loaded with 1,5 kg/m.
Suspension track No. 4: was made by three hangers (type WPCO 800) which were fixed to ceiling by four dowels (type PSRO M10x80) in spacing of 1500 mm. Four booms (type WMCO 400) were fixed by screws (type SM M10 x 70) at each hanger. Holders (type UPWO) were fixed at the end of booms. Booms were fixed through these holders by threaded bar M10 with washers and nuts M10 to ceiling holder (type USOV) which was fixed to ceiling by dowel (type PSRO M10x80).
Trays (type KCOP 400H60/3) were fixed at upper booms and jointed together by two junctions (type LPOPH60N) and by sheet (type BLO400N) with screws M6 (type SGN M6x12). Trays were fixed to booms by screws M6 (type SGN M6x12). Trays were loaded with 10 kg/m.

Ladders (type DGOP 400H60N) were fixed at bottom booms and jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14). Ladders were fixed to booms by clips (type ZMO) with screws M8 (type SGN M8x14). Ladders were loaded with 20 kg/m.
Types of individual components are from catalogue BAKS 8/2006.

Cable penetration through the wall of test furnace was sealed by mineral wool Rockwool.
Loading with steel chain were used as the equivalent load.

More detailed information about specimen construction is shown in the drawings which form the appendix of test report. Drawings were delivered by the sponsor of the test.

All the information about technical specifications of used materials and semi-products, information about their type sign and their producers were delivered by sponsor. This information was not subject of the specimen inspection.

3. Test reports or extended application reports in support of classification

3.1 Test reports and extended application reports

No.	Name of laboratory	Name of sponsor	Test report No.	Date of the test	Test method
[1]	*Fires s.r.o., Batizovce, SR*	*BAKS Kazimierz Sielski Karczew, PL*	*FIRES-FR-235-07-AUNE*	*20. 12. 2007*	*DIN 4102 – 12: 1998-11*

3.2 Test results

Specimens	Time to first failure/interruption of conductor
Specimen 1: cable (N)HXCH 4x50/25 RM FE180 PH90/E90	**81 minutes**
Specimen 2: cable (N)HXCH 4x50/25 RM FE180 PH90/E90	**88 minutes**
Specimen 3: cable (N)HXCH 4x50/25 RM FE180 PH30/E30-E60	**62 minutes**
Specimen 4: cable (N)HXCH 4x50/25 RM FE180 PH30/E30-E60	**51 minutes**
Specimen 5: cable (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 6: cable (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	**79 minutes**
Specimen 7: cable (N)HXH 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 8: cable (N)HXH 4x50 RM FE180 PH30/E30-E60	**7 minutes**
Specimen 9: cable (N)HXH 4x50 RM FE180 PH30/E30-E60	**77 minutes**
Specimens 10,11: cables (N)HXH 4x50 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimens 12,13: cables (N)HXH 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 14: cable (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30-E60	**78 minutes**
Specimen 15: cable (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30-E60	**67 minutes**
Specimen 16: cable (N)HXH 4x1,5 RE FE180 PH30/E30-E60	**81 minutes**
Specimen 17: cable (N)HXH 4x1,5 RE FE180 PH30/E30-E60	**73 minutes**
Specimens 18,19: cables (N)HXH 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 20: cable (N)HXH 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimens 21, 22: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimens 23, 24: cables (N)HXCH 4x50/25 RM FE180 PH30/E30-E60	**90 minutes no failure/interruption**
Specimens 25, 26: cables (N)HXH 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimens 27, 28: cables (N)HXH 4x50 RM FE180 PH30/E30-E60	**90 minutes no failure/interruption**
Specimens 29, 30: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 31: cable (N)HXCH 4x50/25 RM FE180 PH30/E30-E60	**64 minutes**
Specimen 32: cable (N)HXCH 4x50/25 RM FE180 PH30/E30-E60	**55 minutes**
Specimens 33, 34: cables (N)HXH 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 35: cable (N)HXH 4x50 RM FE180 PH30/E30-E60	**17 minutes**
Specimen 36: cable (N)HXH 4x50 RM FE180 PH30/E30-E60	**62 minutes**
Specimens 53A,B: HTKSH 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimens 54A,B: HTKSH 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 55A: HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	**38 minutes**
Specimen 55B: HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	**41 minutes**

Specimens	Time to first failure/interruption of conductor
Specimen 59A: HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	**65 minutes**
Specimen 59B: HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	**75 minutes**
Specimen 63A: HTKSH 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 63B: HTKSH 1x2x0,8 FE180 PH90/E30-E90	**48 minutes**
Specimen 64B: HTKSH 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimens 70A,B: HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 71A: HTKSH 1x2x0,8 FE180 PH90/E30-E90	**81 minutes**
Specimen 71B: HTKSH 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 74A,B: HTKSH 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**

The fire test was discontinued in 93rd minute at the request of sponsor.

Specimens S1 – S36 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.

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

Cables are classified according to the classes:

Cable	Type of cable, single cross-sections and number of conductors	Arrangement	Classification for type of cable (by cross-sections and number of conductors)	Classification for cable
(N)HXH PH30/ E30-E60	(N)HXH 4x1,5 RE FE180 PH30/E30-E60	Basket cable tray KDSO400H60 (BAKS) Suspension track No.2	**E 60**	**-**
	(N)HXH 4x50 RM FE180 PH30/E30-E60	Tray (BAKS) Suspension track No.4	**E 90**	**-**
(N)HXCH PH30/ E30-E60	(N)HXCH 4x1,5/1,5 RE FE180 PH30/E30-E60	Basket cable tray KDSO400H60 (BAKS) Suspension track No.2	**E 60**	**-**
	(N)HXCH 4x50/25 RM FE180 PH30/E30-E60	Basket cable tray KDSO400H60 (BAKS) Suspension track No.1	**E 30**	**-**
	(N)HXCH 4x50/25 RM FE180 PH30/E30-E60	Tray (BAKS) Suspension track No.4	**E 90**	**-**
	(N)HXCH 4x50/25 RM FE180 PH30/E30-E60	Ladder (BAKS) Suspension track No.4	**E 30**	**-**
(N)HXH PH90/E90	(N)HXH 4x1,5 RE FE180 PH90/E90	Basket cable tray KDSO400H60 (BAKS) Suspension track No.1	**E 90**	**E 90**
	(N)HXH 4x50 RM FE180 PH90/E90		**E 90**	
	(N)HXH 4x1,5 RE FE180 PH90/E90	Basket cable tray KDSO60H60 (BAKS) Suspension track No.3	**E 90**	**-**
	(N)HXH 4x1,5 RE FE180 PH90/E90	Tray (BAKS) Suspension track No.4	**E 90**	**-**
	(N)HXH 4x1,5 RE FE180 PH90/E90	Ladder (BAKS) Suspension track No.4	**E 90**	**-**
(N)HXCH PH90/E90	(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	Basket cable tray KDSO400H60 (BAKS) Suspension track No.1	**E 60**	**E 60**
	(N)HXCH 4x50/25 RM FE180 PH90/E90		**E 60**	
	(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	Tray (BAKS) Suspension track No.4	**E 90**	**-**
	(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	Ladder (BAKS) Suspension track No.4	**E 90**	**-**

Cable	Type of cable, single cross-sections and number of conductors	Arrangement	Classification for type of cable (by cross-sections and number of conductors)	Classification for cable nx2x0,8 n≥1
HTKSH PH90/ E30-E90	HTKSH 1x2x0,8 FE180 PH90/E30-E90	Basket cable tray KDSO400H60 (BAKS) Suspension track No.2	**E 90**	**E 90**
	HTKSH 1x2x0,8 FE180 PH90/E30-E90	Tray (BAKS) Suspension track No.4	**E 60**	**E 60**
	HTKSH 1x2x0,8 FE180 PH90/E30-E90	Ladder (BAKS) Suspension track No.4	**E 90**	**E 90**
	HTKSH 1x2x0,8 FE180 PH90/E30-E90	Clips UEF (BAKS) in spacing of 600 mm	**E 90**	**E 90**
	HTKSH 1x2x0,8 FE180 PH90/E30-E90	Clips UDF (BAKS) in spacing of 600 mm	**E 90**	**E 90**
	HTKSH 1x2x0,8 FE180 PH90/E30-E90	Clips UKO (BAKS) in spacing of 600 mm	**E 30**	**E 30**
HTKSHekw PH90/ E30-E90	HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	Basket cable tray KDSO400H60 (BAKS) Suspension track No.2	**E 30**	**E 30**
	HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	Basket cable tray KDSO60H60 (BAKS) Suspension track No.3	**E 60**	**E 60**
	HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	Tray (BAKS) Suspension track No.4	**E 90**	**E 90**

The element, Cable bearing system BAKS is classified according to the classes.

Cable bearing system BAKS – tested ceiling clips UKO in spacing of 600 mm for power and communication non-halogen cables with minimal circuit integrity maintenance 30 minutes according to DIN 4102-12:

Fire resistance classification: E 30

Cable bearing system BAKS – tested basket cable trays KDSO400H60 (loaded 10 kg/m) with consoles in spacing of 1200 mm for power and communication non-halogens cables with minimal circuit integrity maintenance 60 minutes according to DIN 4102-12:

Fire resistance classification: E 60

Cable bearing system BAKS – tested basket cable trays KDSO60H60 (loaded 1,5 kg/m), KDSO400H60 (loaded 20 kg/m) with consoles in spacing of 1200 mm, trays KCOP 400H60/3 (loaded 10 kg/m) and ladders DGOP 400H60N (loaded 20 kg/m) with consoles in spacing of 1500 mm for power and communication non-halogen cables with minimal circuit integrity maintenance 90 minutes according to DIN 4102-12:

Fire resistance classification: E 90

4.3 Field of application

This classification is valid *according standard* DIN 4102 – 12:1998-11 for the following end use applications:

- **§ test results are applicable only for tested supporting systems (straight trays, straight ladders, straight basket cable trays without bending apart from KDSO60H60);**
- § test results acquired for cables fixed individually at the ceiling with usage of the individual clips and individual clips with longitudinal supports are applicable for vertical systems (e. g. slope) while the cable system is supported in transition places (e.g. where system traverses from the horizontal to the vertical arrangement) in case that cables are not slide and whirl in corners;
- § 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 clamps of 300 mm;
- § test results cables in the tray are also applicable to supporting constructions fixed in the wall, while this construction was tested at the maximal loading according to the standard;
- § test results are applicable only for systems without connection elements (e.g. junction box, branch bar);

5. Limitations

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

The classification is valid until 31. 03. 2013 provided that the product, field of application and standards and regulations are not changed.

SIGNED **APPROVED**

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technician of testing laboratory

Ing. Štefan Rástocký
head of testing laboratory