FIRES
The Experts On Fire Safety

TEST REPORT FIRES-FR-057-09-AUNE

Cable bearing system BAKS with TECHNOKABEL cables and dowels DROMET

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FIRES
The Experts on Fire Safety

SNAS
Reg. No. 041/S-159

Testing laboratory No. 041/S-159 accredited by
Slovak national accreditation service

TEST REPORT

Test report number: **FIRES-FR-057-09-AUNE**
Tested property: Function in fire
Test method: DIN 4102 – 12:1998-11

Date of issue: **09. 06. 2009**

Name of the product: Cable bearing system BAKS with TECHNOKABEL cables and dowels DROMET

Manufacturer: **BAKS Kazimierz Sielski,** ul. Jagodne 5,
05-480 Karczew, Poland - producer of construction
TECHNOKABEL S.A., Nasielska 55,
04-343 Warszawa, Poland – producer of cables
DROMET Sp.J., ul. 3 maja 4,
96-313 Jaktorów, Chylice Kolonia, Poland – producer of dowels

Sponsor: **BAKS Kazimierz Sielski,** ul. Jagodne 5, 05-480 Karczew, Poland
TECHNOKABEL S.A., Nasielska 55, 04-343 Warszawa, Poland
DROMET Sp.J., ul. 3 maja 4, 96-313 Jaktorów, Chylice Kolonia, Poland

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Task No.: PR-09-0051
Specimen received: 30. 03. 2009
Date of the fire test: 02. 04. 2009
Technician responsible for the technical side of this report: Miroslav Hudák

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1. INTRODUCTION

This test report contains the results of the test carried out at the testing laboratory of FIRES s.r.o. in Batizovce. The purpose of the test was product classification. The test specimen was cable bearing system BAKS with power and communication non-halogen TECHNOKABEL cables with circuit integrity maintenance and dowels DROMET. Persons witnessing the test:

Representatives of the sponsor: Mr. Kliczek (BAKS)
Mr. Matysiak (BAKS)
Mr. Kwiatkowski (TECHNOKABEL)
Mr. Stradomski (TECHNOKABEL)
Mr. Boguta (DROMET)

Test directed by: Mr. Marek Gorlický
Test carried out by: Mr. Miroslav Hudák
Operator: Mr. Alexander Reľovský

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Fires s.r.o. Batizovce is full member of EGOLF also, more information www.egolf.org.uk.

2. MEASURING EQUIPMENT

Identification number	Measuring equipment	Note
F 90 002	Horizontal test furnace for fire testing	-
F 69 005	PLC system for data acquisition and control TECOMAT NS 950	-
F 40 008	Software Control Web 2000	
F 40 009	Control and communication software to PLC TECOMAT NS 950	
F 40 010	Visual and calculating software to PLC TECOMAT NS 950	-
F 40 011	Driver Tecomat – CW 2000 (software)	-
F 71 008, F 71 009	Transducer of differential pressure (from -50 to +150) Pa	pressure inside the test furnace
F 08 521, F 08 522, F 08 523, F 08 52 4 F 08 525, F 08 526, F 08 527, F 08 528	Plate thermometers	temperature inside the test furnace, according to EN 1363-1 a DIN 4102-2
F 08 701	Sheathed thermocouple type K ϕ 3 mm	ambient temperature
F 69 009	PLC system for data acquisition and climate control TECOMAT TC 604	climatic conditions
F 60 001 – F 60 009	Temperature and relative air humidity sensors	climatic conditions
F 54 057	Racking meter	-
F 57 007	Digital stop-watch	-
F 96 015	Test signal panel	-

3. PREPARATION OF THE SPECIMEN

Testing laboratory didn't take off individual components of the specimen. Components take-off and its delivering to the testing laboratory were carried out by the test sponsor. Assembling of the supporting system into the test furnace was carried out by workers of the test sponsor. Mounting of cables and weights into the supporting system was carried out by workers businesses BAKS, TECHNOKABEL and DROMET.

4. PREPARATION OF THE TEST

4.1 DESCRIPTION OF THE SPECIMEN STRUCTURE

Test specimen comprised from cable bearing systems BAKS with accessories – trays, ladders, clips UDF, UEF, UKO1, UKO2 and power and communication non-halogen cables business TECHNOKABEL S. A. and dowels DROMET.

Cables:	(N)HXH 4x1,5 RE FE180 PH30/E30	(6 x)
	(N)HXH 4x50 RM FE180 PH30/E30	(6 x)
	(N)HXCH 4x1,5/1,5 RE FE180 PH30/E30	(6 x)
	(N)HXCH 4x50/25 RM FE180 PH30/E30	(6 x)
	(N)HXH 4x1,5 RE FE180 PH90/E90	(8 x)
	(N)HXH 4x50 RM FE180 PH90/E90	(8 x)
	(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	(8 x)
	(N)HXCH 4x50/25 RM FE180 PH90/E90	(8 x)
	NHXH-J 4x1,5 RE FE180 PH90/E90	(5 x)
	NHXH-J 4x50 RM FE180 PH90/E90	(5 x)
	NHXCH 4x1,5/1,5 RE FE180 PH90/E90	(2 x)
	NHXCH 4x50/25 RM FE180 PH90/E90	(2 x)
	HTKSH 1x2x0,8 FE180 PH90/E30-E90	(2 x)
	HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	(2 x)
	HDGszo 3x1,5 FE180 PH90/E30-E90	(12 x)
	HDGsekwzo 3x1,5 FE180 PH90/E30-E90	(6 x)
	HLGs 2x1,0 FE180 PH90/E30-E90	(10 x)
	HLGsekw 2x1,0 FE180 PH90/E30-E90	(8 x)

Supporting system BAKS: ceiling installation and four suspension tracks was used for specimen test.

Ceiling installation: was made by cable clips (type UEF) which were fixed to ceiling by dowels (type SRO M6x30, producer DROMET Sp. J. S.W.H. Drazikowscy, Jaktorów, Poland) in spacing of 600 mm, cable clips (type UDF) which were fixed to ceiling by dowels (type PSR M6x65, producer DROMET) in spacing of 600 mm and ceiling ledges (type SDOC 1000) which were fixed to ceiling by dowels (type PSRn M8x75, producer DROMET) in spacing of 600 mm. Cables were fixed to ledges by clips (type UKO1 and UKO2) in spacing of 600 mm. Cable clips were depending on the diameter of cables.

Suspension track No. 1: was made of three consoles combined of three horizontal supports (type CWOP40H40/05) and two threaded bar (type PGM10/1x800) with washers and nuts M10 and two hangers (type USOV) which were fixed to ceiling by dowels (type PSRn M10x85, producer DROMET) in spacing of 1200 mm.

Trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm) were fixed at upper and under horizontal supports and jointed together by two junctions (type LPOPH60N) and by sheet (type BLO 400N) with screws M6 (type SGN M6x12). Trays were fixed to supports by screws M6 (type SGN M6x12).

Ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were fixed at central horizontal supports and jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14). Ladders were fixed to supports by clips (type ZMO) with screws M8 (type SGN M8x14). Cables were fixed to trays by clips UDF and ladders by clips UKO1.

Suspension track No. 2: was made of three consoles combined of three horizontal supports (type CWOP40H40/05) and two threaded bar (type PGM10/1x800) with washers and nuts M10 which were fixed to ceiling by dowels (type TRS M10x40, producer DROMET) in spacing of 1200 mm.

Trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm) were fixed at upper horizontal supports and jointed together by two junctions (type LPOPH60N) and by sheet (type BLO 400N) with screws M6 (type SGN M6x12). Trays were fixed to supports by screws M6 (type SGN M6x12).

Ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were fixed at central and under horizontal supports and jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14). Ladders were fixed to supports by clips (type ZMO) with screws M8 (type SGN M8x14). Cables were fixed to trays by clips UDF and ladders by clips UKO1.

Suspension track No. 3: was made of three consoles combined of two horizontal supports (type CWOP40H40/05) and two threaded bar (type PGM10/1x800) with washers and nuts M10 which were fixed to ceiling by dowels (type TRS M10x40, producer DROMET) in spacing of 1200 mm.

Trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm) were fixed at upper horizontal supports and jointed together by two junctions (type LPOPH60N) and by sheet (type BLO 400N) with screws M6 (type SGN M6x12). Trays were fixed to supports by screws M6 (type SGN M6x12).

Ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were fixed at under horizontal supports and jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14). Ladders were fixed to supports by clips (type ZMO) with screws M8 (type SGN M8x14). Cables were fixed to trays by clips UDF and ladders by clips UKO1.

Suspension track No. 4: was made by three hangers (type WPCO 800) which were fixed to ceiling by two dowels (type PSRn M8x75, producer DROMET) in spacing of 1200 mm. Two booms (type WMCO 400) were fixed by screws (type SM M10x20) at each hanger. Holders (type UPWO) were fixed at the end of booms. Booms were fixed through these holders by threaded bar (type PGM10/1x800) with washers and nuts M10 to ceiling holder (type USOV) which was fixed to ceiling by dowel (type PSRn M8x75, producer DROMET).

Trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm) were fixed at upper horizontal supports and jointed together by two junctions (type LPOPH60N) and by sheet (type BLO 400N) with screws M6 (type SGN M6x12). Trays were fixed to supports by screws M6 (type SGN M6x12).

Ladders (type DUOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were fixed at under 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). Cables were fixed to trays by clips UDF and ladders by clips UKO1.

Trays were loaded with 10 kg/m and ladders were loaded with 20 kg/m.

Two pairs of jointed threaded bars PGM6, PGM8 and PGM10 were also tested with maximal loading during the test.

Two threaded bars (type PGM6/1) were jointed together by kingsize nut (type NP M6x28) and were fixed to ceiling by dowels (type TRS M6x25, producer DROMET) and loaded with 25 kg.

Two threaded bars (type PGM8/1) were jointed together by kingsize nut (type NP M8x28) and were fixed to ceiling by dowels (type TRS M8x30, producer DROMET) and loaded with 40 kg.

Two threaded bars (type PGM10/1) were jointed together by kingsize nut (type NP M10x30) and were fixed to ceiling by dowels (type TRS M10x40, producer DROMET) and loaded with 50 kg.

Types of individual components are from catalogue BAKS.

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 this 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. Parameters which were checked are quoted in paragraph 4.3 SPECIMEN INSPECTION.

4.2 DESCRIPTION OF THE SPECIMEN FIXATION

The test specimen was fixed on the ceiling of the test furnace which was created from concrete panels made of common shocked concrete of class B 20, 150 mm thick.
The type of specimen fixation into the test furnace is visible in drawing documentation and it was selected by the sponsor.

4.3 SPECIMEN INSPECTION

Before and after the fire testing, conformity of the test specimen with drawing was checked. The specimen corresponded to the drawing which create appendix of this report.
Specimen inspection consisted of visual review of the test specimen as well as size verification (number and cross sections of conductors, thickness, measurements of cables and trays).

4.4 CLIMATIC CONDITIONING

Test specimens were stored in the climatic hall and conditioned according to EN 1363-1 under the following climatic conditions:

Relative air humidity [%]		**Ambient air temperature [°C]**	
mean	standard deviation	mean	standard deviation
46,9	2,1	23,2	0,4

The equilibrium state of test specimen humidity was not determined. The test specimen did not comprise hygroscopic material.

5. CARRYING OUT THE TEST

5.1 TEST CONDITIONS

Conditions in the test furnace (temperature, pressure, content O_2 content) as well as conditions in the testing room (ambient temperature) corresponded to EN 1363-1 and DIN 4102-2 during the whole test. Detailed information is shown in appendices of this report or in quality records of the testing laboratory.

Values characterising environment in the testing room directly before the test:

Date of fire test	**Relative air humidity [%]**	**Ambient air temperature [°C]**
02. 04. 2009	42,3	12,2

5.2 TEST RESULTS

The measured values are shown in tables that form an integral part of this test report.

5.3 EVALUATION OF THE TEST

SPECIMENS	Time to first failure/interruption of conductor
Specimen 1: cable (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 2: cable (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 3: cable (N)HXCH 4x50/25 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 4: cable (N)HXCH 4x50/25 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 5: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 6: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 7: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 8: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 9: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 10: cables (N)HXH 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 11: cable (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 12: cable (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 13: cable (N)HXCH 4x50/25 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 14: cable (N)HXCH 4x50/25 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 15: cable (N)HXH 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 16: cable (N)HXH 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 17: cable (N)HXH 4x50 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 18: cable (N)HXH 4x50 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 19: cable (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**
Specimen 21: cable (N)HXH 4x50 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 22: cable (N)HXH 4x50 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 23: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 24: cables (N)HXH 4x50 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 25: cables NHXH-J 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 26: cables NHXH-J 4x50 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 27: cables (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 28: cables (N)HXH 4x1,5 RE FE180 PH30/E30	**77 minutes**
Specimen 29: cables (N)HXCH 4x50/25 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 30: cables (N)HXH 4x50 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 31: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	**62 minutes**
Specimen 32: cables (N)HXH 4x1,5 RE FE180 PH90/E90	**44 minutes**
Specimen 33: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 34: cables (N)HXH 4x50 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 35: cable (N)HXH 4x1,5 RE FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 36: cable (N)HXH 4x1,5 RE FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 37: cable (N)HXH 4x50 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 38: cable (N)HXH 4x50 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 39: cable (N)HXH 4x1,5 RE FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 40: cable (N)HXH 4x1,5 RE FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 41: cable (N)HXH 4x50 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 42: cable (N)HXH 4x50 RM FE180 PH30/E30	**90 minutes no failure/interruption**
Specimen 43: cable NHXCH 4x1,5/1,5 RE FE180 PH90/E90	**49 minutes**
Specimen 44: cable NHXCH 4x1,5/1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 45: cable NHXCH 4x50/25 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 46: cable NHXCH 4x50/25 RM FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 47: cable NHXH-J 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 48: cable NHXH-J 4x1,5 RE FE180 PH90/E90	**90 minutes no failure/interruption**
Specimen 49: cable NHXH-J 4x50 RM FE180 PH90/E90	**61 minutes**
Specimen 50: cable NHXH-J 4x50 RM FE180 PH90/E90	**65 minutes**

SPECIMENS	Time to first failure/interruption of conductor
Specimen 52A: cable HLGsekw 2x1,0 FE180 PH90/E30-E90	**34 minutes**
Specimen 52B: cable HLGsekw 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 53A: cable HLGs 2x1,0 FE180 PH90/E30-E90	**53 minutes**
Specimen 53B: cable HLGs 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 54A: cable HLGs 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 54B: cable HLGs 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 55A: cable HLGsekw 2x1,0 FE180 PH90/E30-E90	**39 minutes**
Specimen 55B: cable HLGsekw 2x1,0 FE180 PH90/E30-E90	**54 minutes**
Specimen 56A: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 56B: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**64 minutes**
Specimen 57A: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 57B: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 58A: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 58B: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 59A: cable HLGsekw 2x1,0 FE180 PH90/E30-E90	**66 minutes**
Specimen 59B: cable HLGsekw 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 60A: cable HDGsekwzo 3x1,5 FE180 PH90/E30-E90	**78 minutes**
Specimen 60B: cable HDGsekwzo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 61A: cable HLGs 2x1,0 FE180 PH90/E30-E90	**79 minutes**
Specimen 61B: cable HLGs 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 62A: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 62B: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 64A: cable HLGs 2x1,0 FE180 PH90/E30-E90	**28 minutes**
Specimen 64B: cable HLGs 2x1,0 FE180 PH90/E30-E90	**30 minutes**
Specimen 65A: cable HDGsekwzo 3x1,5 FE180 PH90/E30-E90	**37 minutes**
Specimen 65B: cable HDGsekwzo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 66A: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**50 minutes**
Specimen 66B: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**50 minutes**
Specimen 67A: cable HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 67B: cable HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 68A: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 68B: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	**67 minutes**
Specimen 69A: cable HDGsekwzo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 69B: cable HDGsekwzo 3x1,5 FE180 PH90/E30-E90	**76 minutes**
Specimen 70A: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 70B: cable HDGszo 3x1,5 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 71A: cable HLGsekw 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 71B: cable HLGsekw 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 72A: cable HLGs 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**
Specimen 72B: cable HLGs 2x1,0 FE180 PH90/E30-E90	**90 minutes no failure/interruption**

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

Specimens S1 – S50 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Specimens S52 – S72 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.

6. CLOSING

- This report details the method of construction, the test conditions and results obtained when the specific element of construction described herein was following the procedure outlined in EN 1363-1 and DIN 4102 – 12:1998-11. Any significant deviation with respect to size, constructional details, loads, stresses, edges or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.
- Because of the nature of the fire resistance testing and consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.
- The test results refer only to the tested subjects. This test report is not an approval of the tested product by the test laboratory or the accreditation body overseeing the laboratory's activities. The test was carried out on testing equipment that is the property of FIRES Ltd. Without the written permission of the test laboratory this test report may be copied and/or distributed only as the whole. Any modifications of the test report can be made only by the fire resistance test laboratory FIRES Ltd. Batizovce.

Report checked by: Ing. Štefan Rástocký

Issued by: **Responsible for the technical side of this report:**

Ing. Štefan Rástocký
leader of the testing laboratory

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-1-

Miroslav Hudák
technician of the testing laboratory

7. NORMATIVE REFERENCES

DIN 4102 – 2:1977-09	Fire behaviour of building materials and elements - requirements and testing
DIN 4102 – 12:1998-11	Fire resistance of electric cable systems required to maintain circuit integrity
STN EN 1363-1:2001	Fire resistance tests – Part 1: General requirements

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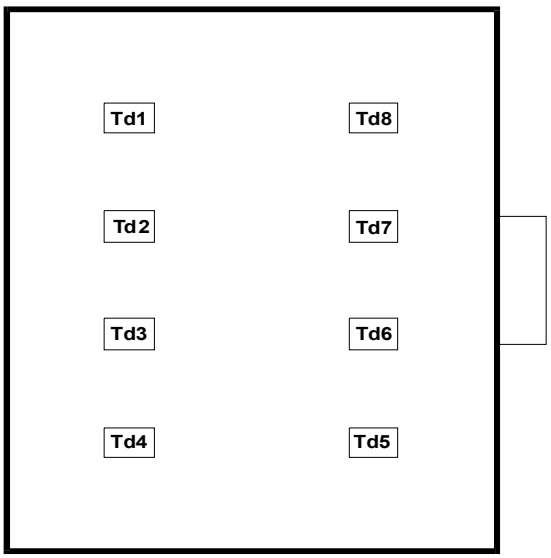
Measured values inside the test furnace

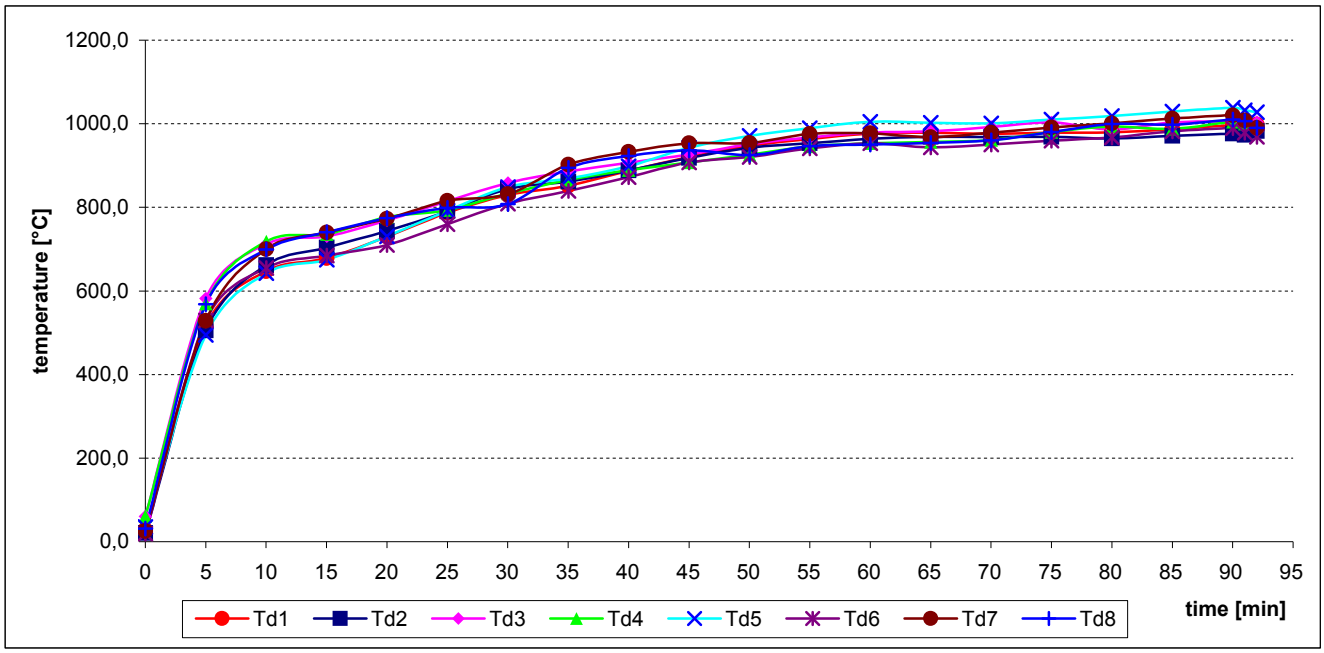
Time t [min]	Temperature [°C]											Deviation d_e [%]	Pressure p [Pa]
	Td1	Td2	Td3	Td4	Td5	Td6	Td7	Td8	Tave	Tn	To		
0	28,3	20,8	60,5	61,3	35,5	19,5	25,5	31,6	35,4	20,0	12,3	0,0	7,0
5	516,4	505,7	581,8	569,8	494,8	529,0	528,6	568,4	536,8	576,4	12,3	-14,6	12,1
10	647,3	661,7	712,2	718,4	642,6	654,9	700,1	698,8	679,5	678,4	12,4	-6,5	11,6
15	678,3	703,5	730,5	735,6	674,7	684,3	740,0	740,4	710,9	738,6	12,4	-4,8	13,7
20	729,9	743,8	768,7	776,4	730,9	710,1	772,4	774,1	750,8	781,4	12,4	-4,5	12,3
25	787,1	790,5	814,6	793,6	792,0	759,8	815,7	798,4	794,0	814,6	12,4	-4,1	14,8
30	829,5	844,2	858,2	833,0	848,6	808,5	831,7	808,1	832,7	841,8	11,8	-3,7	14,8
35	851,8	861,3	885,7	865,0	869,5	839,2	902,0	894,3	871,1	864,8	11,8	-3,1	15,4
40	887,4	888,1	907,0	889,2	898,4	872,0	932,8	922,4	899,7	884,7	12,0	-2,4	16,0
45	920,5	917,9	926,5	907,3	942,5	907,2	953,5	936,2	926,5	902,3	12,1	-1,8	15,6
50	947,1	942,4	950,8	926,0	971,3	920,8	954,3	924,9	942,2	918,1	12,0	-1,3	16,0
55	963,0	953,1	967,1	945,6	989,4	941,5	975,6	946,4	960,2	932,3	11,9	-0,8	13,0
60	976,5	963,8	978,5	953,5	1005,0	953,7	977,1	950,3	969,8	945,3	11,9	-0,5	12,0
65	979,0	968,7	982,1	956,3	1002,2	943,7	967,8	954,0	969,2	957,3	11,9	-0,2	12,4
70	975,3	967,6	992,3	960,7	1001,0	950,5	978,9	960,0	973,3	968,4	11,8	-0,1	14,1
75	979,0	968,5	1003,0	980,4	1010,1	959,6	990,8	980,2	984,0	978,7	11,7	-0,1	13,6
80	979,6	964,9	986,5	993,1	1018,2	967,4	1001,0	999,5	988,8	988,4	11,7	-0,1	13,0
85	987,0	971,3	1003,0	987,9	1029,0	981,9	1012,0	998,1	996,3	997,4	11,7	-0,1	12,1
90	996,4	976,7	1005,0	1005,0	1038,6	989,1	1020,0	1010,0	1005,1	1005,9	11,6	-0,1	13,6
91	993,3	973,2	1000,0	1000,0	1032,4	978,4	1008,0	1006,0	998,9	1007,6	11,6	-0,1	13,3
92	997,9	982,6	1004,0	996,3	1027,4	968,5	990,4	990,2	994,7	1009,2	11,6	-0,1	11,9

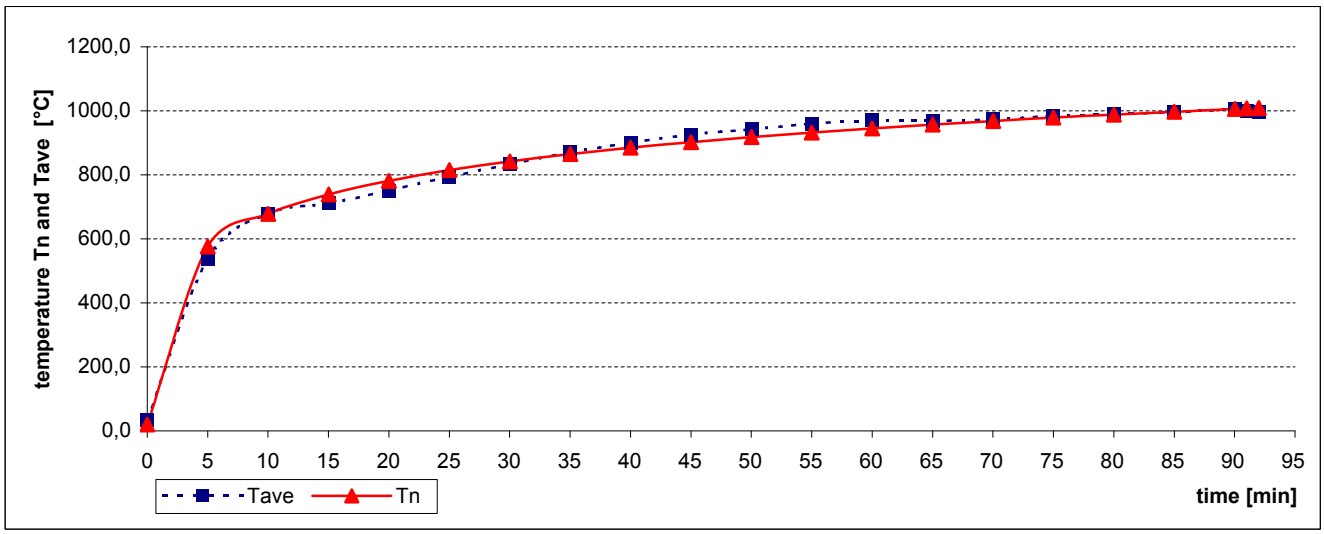
Tave Average temperature in the test furnace calculated from plate thermometers
Tn Standard temperature in the test furnace laid down to test guideline
To Ambient temperature
d_e Deviation of the average temperature from the standard temperature calculated according to test guideline
p Pressure inside the test furnace measured under the ceiling of the test furnace

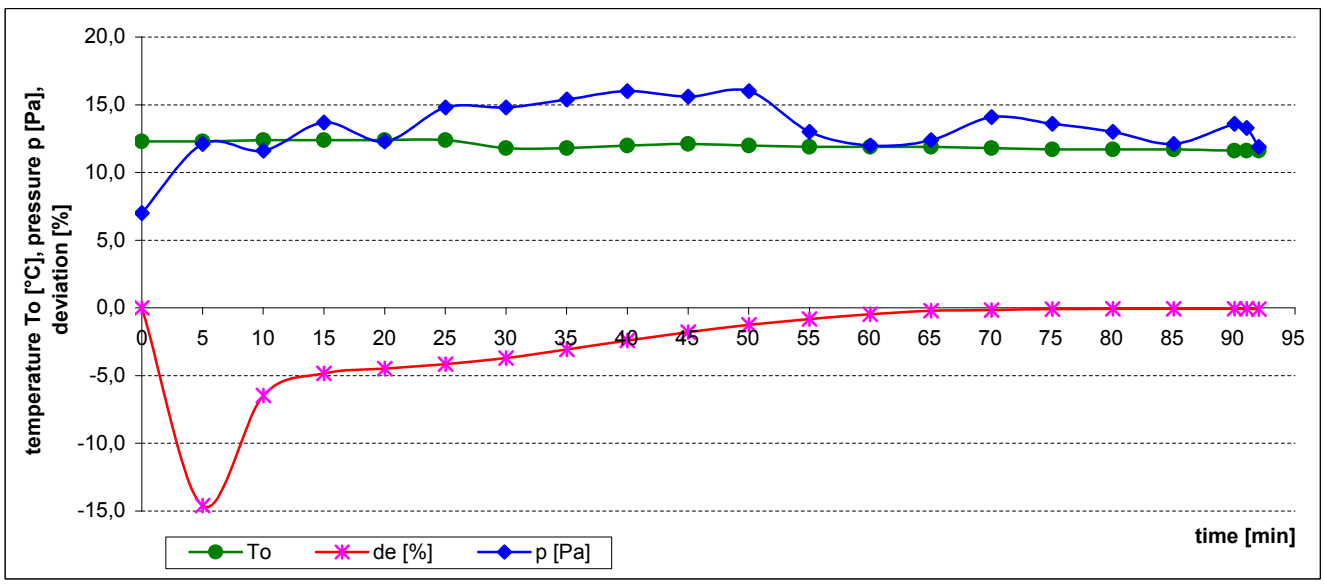
Layout of measuring points in the test furnace:



Measured values inside the test furnace / graph







Measured time of tested specimens from S1 to S8

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S1	1-L1	no failure / interruption
	2-L2	no failure / interruption
	3-L3	no failure / interruption
	4-PEN	no failure / interruption
S2	5-L1	no failure / interruption
	6-L2	no failure / interruption
	7-L3	no failure / interruption
	8-PEN	no failure / interruption
S3	9-L1	no failure / interruption
	10-L2	no failure / interruption
	11-L3	no failure / interruption
	12-PEN	no failure / interruption
S4	13-L1	no failure / interruption
	14-L2	no failure / interruption
	15-L3	no failure / interruption
	16-PEN	no failure / interruption
S5	17-L1	no failure / interruption
	18-L2	no failure / interruption
	19-L3	no failure / interruption
	20-PEN	no failure / interruption
S6	21-L1	no failure / interruption
	22-L2	no failure / interruption
	23-L3	no failure / interruption
	24-PEN	no failure / interruption
S7	25-L1	no failure / interruption
	26-L2	no failure / interruption
	27-L3	no failure / interruption
	28-PEN	no failure / interruption
S8	29-L1	no failure / interruption
	30-L2	no failure / interruption
	31-L3	no failure / interruption
	32-PEN	no failure / interruption

Specimens 1, 2: cables (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30
Specimens 3, 4: cables (N)HXCH 4x50/25 RM FE180 PH30/E30
Specimen 5: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimen 6: cables (N)HXCH 4x50/25 RM FE180 PH90/E90
Specimen 7: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimen 8: cables (N)HXCH 4x50/25 RM FE180 PH90/E90

Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S9 to S16

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S9	33-L1	no failure / interruption
	34-L2	no failure / interruption
	35-L3	no failure / interruption
	36-PEN	no failure / interruption
S10	37-L1	no failure / interruption
	38-L2	no failure / interruption
	39-L3	no failure / interruption
	40-PEN	no failure / interruption
S11	41-L1	no failure / interruption
	42-L2	no failure / interruption
	43-L3	no failure / interruption
	44-PEN	no failure / interruption
S12	45-L1	no failure / interruption
	46-L2	no failure / interruption
	47-L3	no failure / interruption
	48-PEN	no failure / interruption
S13	49-L1	no failure / interruption
	50-L2	no failure / interruption
	51-L3	no failure / interruption
	52-PEN	no failure / interruption
S14	53-L1	no failure / interruption
	54-L2	no failure / interruption
	55-L3	no failure / interruption
	56-PEN	no failure / interruption
S15	57-L1	no failure / interruption
	58-L2	no failure / interruption
	59-L3	no failure / interruption
	60-PEN	no failure / interruption
S16	61-L1	no failure / interruption
	62-L2	no failure / interruption
	63-L3	no failure / interruption
	64-PEN	no failure / interruption

Specimen 9: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimen 10: cables (N)HXH 4x1,5 RE FE180 PH90/E90
Specimens 11, 12: cables (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30
Specimens 13, 14: cables (N)HXCH 4x50/25 RM FE180 PH30/E30
Specimens 15, 16: cables (N)HXH 4x1,5 RE FE180 PH90/E90

Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S17 to S24

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S17	65-L1	no failure / interruption
	66-L2	no failure / interruption
	67-L3	no failure / interruption
	68-PEN	no failure / interruption
S18	69-L1	no failure / interruption
	70-L2	no failure / interruption
	71-L3	no failure / interruption
	72-PEN	no failure / interruption
S19	73-L1	no failure / interruption
	74-L2	no failure / interruption
	75-L3	no failure / interruption
	76-PEN	no failure / interruption
S20	77-L1	no failure / interruption
	78-L2	no failure / interruption
	79-L3	no failure / interruption
	80-PEN	no failure / interruption
S21	81-L1	no failure / interruption
	82-L2	no failure / interruption
	83-L3	no failure / interruption
	84-PEN	no failure / interruption
S22	85-L1	no failure / interruption
	86-L2	no failure / interruption
	87-L3	no failure / interruption
	88-PEN	no failure / interruption
S23	89-L1	no failure / interruption
	90-L2	no failure / interruption
	91-L3	no failure / interruption
	92-PEN	no failure / interruption
S24	93-L1	no failure / interruption
	94-L2	no failure / interruption
	95-L3	no failure / interruption
	96-PEN	no failure / interruption

Specimens 17, 18: cables (N)HXH 4x50 RM FE180 PH90/E90
Specimens 19, 20: cables (N)HXH 4x1,5 RE FE180 PH90/E90
Specimens 21, 22: cables (N)HXH 4x50 RM FE180 PH90/E90
Specimen 23: cables (N)HXCH 4x50/25 RM FE180 PH90/E90
Specimen 24: cables (N)HXH 4x50 RM FE180 PH90/E90

Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S25 to S32

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S25	97-L1	no failure / interruption
	98-L2	no failure / interruption
	99-L3	no failure / interruption
	100-PEN	no failure / interruption
S26	101-L1	no failure / interruption
	102-L2	no failure / interruption
	103-L3	no failure / interruption
	104-PEN	no failure / interruption
S27	105-L1	no failure / interruption
	106-L2	no failure / interruption
	107-L3	no failure / interruption
	108-PEN	no failure / interruption
S28	109-L1	x
	110-L2	x
	111-L3	77:58
	112-PEN	x
S29	113-L1	no failure / interruption
	114-L2	no failure / interruption
	115-	no failure / interruption
	116-PEN	no failure / interruption
S30	117-L1	no failure / interruption
	118-L2	no failure / interruption
	119-L3	no failure / interruption
	120-PEN	no failure / interruption
S31	121-L1	62:45
	122-L2	62:45
	123-L3	x
	124-PEN	x
S32	125-L1	44:09
	126-L2	44:09
	127-L3	x
	128-PEN	x

Specimen 25: cables NHXH-J 4x1,5 RE FE180 PH90/E90
Specimen 26: cables NHXH-J 4x50 RM FE180 PH90/E90
Specimen 27: cables (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30
Specimen 28: cables (N)HXH 4x1,5 RE FE180 PH30/E30
Specimen 29: cables (N)HXCH 4x50/25 RM FE180 PH30/E30
Specimen 30: cables (N)HXH 4x50 RM FE180 PH30/E30
Specimen 31: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimen 32: cables (N)HXH 4x1,5 RE FE180 PH90/E90

x conductor was turned off manually after permanent interruption / failure of other conductors in the cable

Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W. Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S33 to S41

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S33	129-L1	no failure / interruption
	130-L2	no failure / interruption
	131-L3	no failure / interruption
	132-PEN	no failure / interruption
S34	133-L1	no failure / interruption
	134-L2	no failure / interruption
	135-L3	no failure / interruption
	136-PEN	no failure / interruption
S35	137-L1	no failure / interruption
	138-L2	no failure / interruption
	139-L3	no failure / interruption
	140-PEN	no failure / interruption
S36	141-L1	no failure / interruption
	142-L2	no failure / interruption
	143-L3	no failure / interruption
	144-PEN	no failure / interruption
S37	145-L1	no failure / interruption
	146-L2	no failure / interruption
	147-L3	no failure / interruption
	148-PEN	no failure / interruption
S38	149-L1	no failure / interruption
	150-L2	no failure / interruption
	151-L3	no failure / interruption
	152-PEN	no failure / interruption
S39	153-L1	no failure / interruption
	154-L2	no failure / interruption
	155-L3	no failure / interruption
	156-PEN	no failure / interruption
S40	157-L1	no failure / interruption
	158-L2	no failure / interruption
	159-L3	no failure / interruption
	160-PEN	no failure / interruption
S41	161-L1	no failure / interruption
	162-L2	no failure / interruption
	163-L3	no failure / interruption
	164-PEN	no failure / interruption

Specimen 33: cables (N)HXCH 4x50/25 RM FE180 PH90/E90
Specimen 34: cables (N)HXH 4x50 RM FE180 PH90/E90
Specimens 35, 36: cables (N)HXH 4x1,5 RE FE180 PH30/E30
Specimens 37, 38: cables (N)HXH 4x50 RM FE180 PH30/E30
Specimens 39, 40: cables (N)HXH 4x1,5 RE FE180 PH30/E30
Specimen 41: cable (N)HXH 4x50 RM FE180 PH30/E30

Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W. Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S42 to S50

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S42	165-L1	no failure / interruption
	166-L2	no failure / interruption
	167-L3	no failure / interruption
	168-PEN	no failure / interruption
S43	169-L1	49:45
	170-L2	x
	171-L3	x
	172-PEN	x
S44	173-L1	no failure / interruption
	174-L2	no failure / interruption
	175-L3	no failure / interruption
	176-PEN	no failure / interruption
S45	177-L1	no failure / interruption
	178-L2	no failure / interruption
	179-L3	no failure / interruption
	180-PEN	no failure / interruption
S46	181-L1	no failure / interruption
	182-L2	no failure / interruption
	183-L3	no failure / interruption
	184-PEN	no failure / interruption
S47	185-L1	no failure / interruption
	186-L2	no failure / interruption
	187-L3	no failure / interruption
	188-PEN	no failure / interruption
S48	189-L1	no failure / interruption
	190-L2	no failure / interruption
	191-L3	no failure / interruption
	192-PEN	no failure / interruption
S49	193-L1	x
	194-L2	61:30
	195-L3	x
	196-PEN	x
S50	197-L1	x
	198-L2	x
	199-L3	65:38
	200-PEN	x

Specimen 42: cable (N)HXH 4x50 RM FE180 PH30/E30
Specimens 43, 44: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimens 45, 46: cables NHXCH 4x50/25 RM FE180 PH90/E90
Specimens 47, 48: cables NHXH-J 4x1,5 RE FE180 PH90/E90
Specimens 49, 50: cables NHXH-J 4x50 RM FE180 PH90/E90

x conductor was turned off manually after permanent interruption / failure of other conductors in the cable

Power cables were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W. Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S52 to S59

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S52A	209-L	34:54
	210-PEN	x
S52B	211-L	no failure / interruption
	212-PEN	no failure / interruption
S53A	213-L	x
	214-PEN	53:50
S53B	215-L	no failure / interruption
	216-PEN	no failure / interruption
S54A	217-L	no failure / interruption
	218-PEN	no failure / interruption
S54B	219-L	no failure / interruption
	220-PEN	no failure / interruption
S55A	221-L	39:40
	222-PEN	x
S55B	223-L	54:31
	224-PEN	x
S56A	225-L	no failure / interruption
	226-PEN	no failure / interruption
S56B	227-L	64:08
	228-PEN	x
S57A	229-L	no failure / interruption
	230-PEN	no failure / interruption
S57B	231-L	no failure / interruption
	232-PEN	no failure / interruption
S58A	233-L	no failure / interruption
	234-PEN	no failure / interruption
S58B	235-L	no failure / interruption
	236-PEN	no failure / interruption
S59A	237-L	66:14
	238-PEN	x
S59B	239-L	no failure / interruption
	240-PEN	no failure / interruption

Specimens 52: cables HLGsekw 2x1,0 FE180 PH90/E30-E90
Specimens 53: cables HLGs 2x1,0 FE180 PH90/E30-E90
Specimens 54: cables HLGs 2x1,0 FE180 PH90/E30-E90
Specimens 55: cables HLGsekw 2x1,0 FE180 PH90/E30-E90
Specimens 56: cables HDGszo 3x1,5 FE180 PH90/E30-E90
Specimens 57: cables HDGszo 3x1,5 FE180 PH90/E30-E90
Specimens 58: cables HDGszo 3x1,5 FE180 PH90/E30-E90
Specimens 59: cables HLGsekw 2x1,0 FE180 PH90/E30-E90

x conductor was turned off manually after permanent interruption / failure of other conductors in the cable

Signal cables were tested by three-phase voltage supply 1 x 110V with LED diods 3V / 0,03W. Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S60 to S67

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S60A	241-L	78:01
	242-PEN	x
S60B	243-L	no failure / interruption
	244-PEN	no failure / interruption
S61A	245-L	x
	246-PEN	79:47
S61B	247-L	no failure / interruption
	248-PEN	no failure / interruption
S62A	249-L	no failure / interruption
	250-PEN	no failure / interruption
S62B	251-L	no failure / interruption
	252-PEN	no failure / interruption
S64A	257-L	x
	258-PEN	28:36
S64B	259-L	x
	260-PEN	30:15
S65A	261-L	37:42
	262-PEN	x
S65B	263-L	no failure / interruption
	264-PEN	no failure / interruption
S66A	265-L	50:50
	266-PEN	x
S66B	267-L	50:34
	268-PEN	x
S67A	269-L	no failure / interruption
	270-PEN	no failure / interruption
S67B	271-L	no failure / interruption
	272-PEN	no failure / interruption

Specimens 60: cables HDGsekwzo 3x1,5 FE180 PH90/E30-E90
Specimens 61: cables HLGs 2x1,0 FE180 PH90/E30-E90
Specimens 62: cables HDGszo 3x1,5 FE180 PH90/E30-E90
Specimens 64: cables HLGs 2x1,0 FE180 PH90/E30-E90
Specimens 65: cables HDGsekwzo 3x1,5 FE180 PH90/E30-E90
Specimens 66: cables HDGszo 3x1,5 FE180 PH90/E30-E90
Specimens 67: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90

x conductor was turned off manually after permanent interruption / failure of other conductors in the cable

Signal cables were tested by three-phase voltage supply 1 x 110V with LED diods 3V / 0,03W. Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S68 to S72

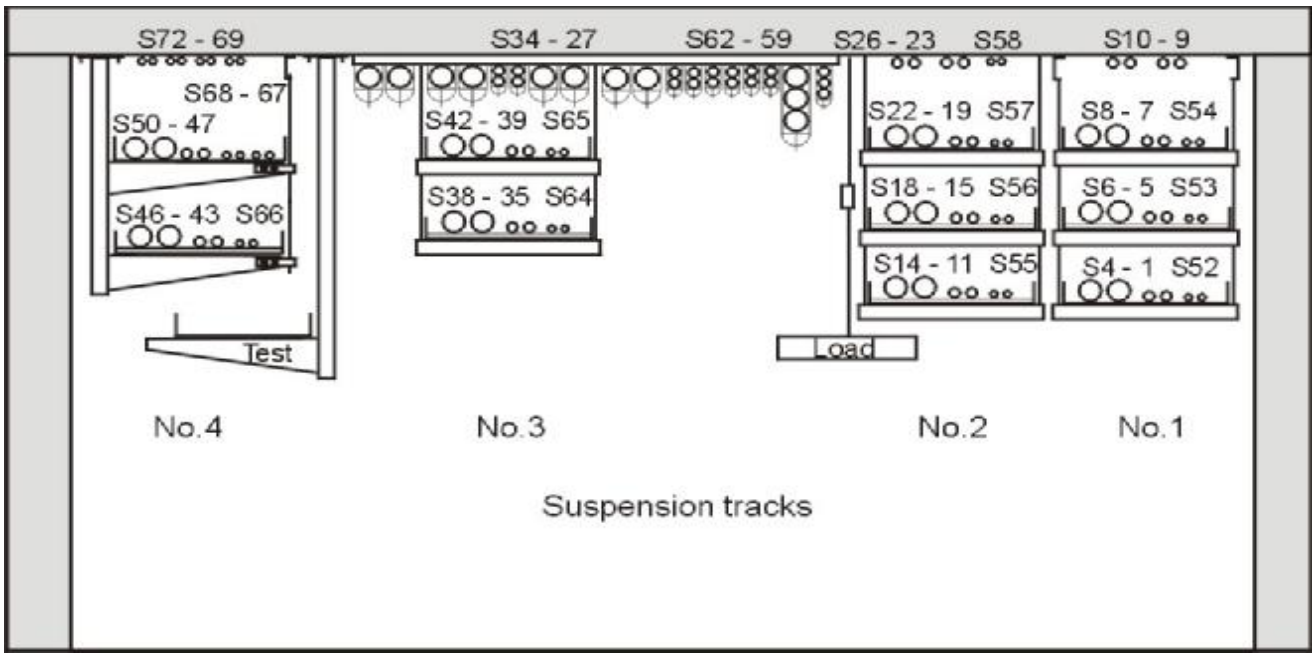
Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S68A	273-L	no failure / interruption
	274-PEN	no failure / interruption
S68B	275-L	67:42
	276-PEN	x
S69A	277-L	no failure / interruption
	278-PEN	no failure / interruption
S69B	279-L	76:39
	280-PEN	x
S70A	281-L	no failure / interruption
	282-PEN	no failure / interruption
S70B	283-L	no failure / interruption
	284-PEN	no failure / interruption
S71A	285-L	no failure / interruption
	286-PEN	no failure / interruption
S71B	287-L	no failure / interruption
	288-PEN	no failure / interruption
S72A	289-L	no failure / interruption
	290-PEN	no failure / interruption
S72B	291-L	no failure / interruption
	292-PEN	no failure / interruption

Specimens 68: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimens 69: cables HDGsekwzo 3x1,5 FE180 PH90/E30-E90
Specimens 70: cables HDGszo 3x1,5 FE180 PH90/E30-E90
Specimens 71: cables HLGsekw 2x1,0 FE180 PH90/E30-E90
Specimens 72: cables HLGs 2x1,0 FE180 PH90/E30-E90

x conductor was turned off manually after permanent interruption / failure of other conductors in the cable

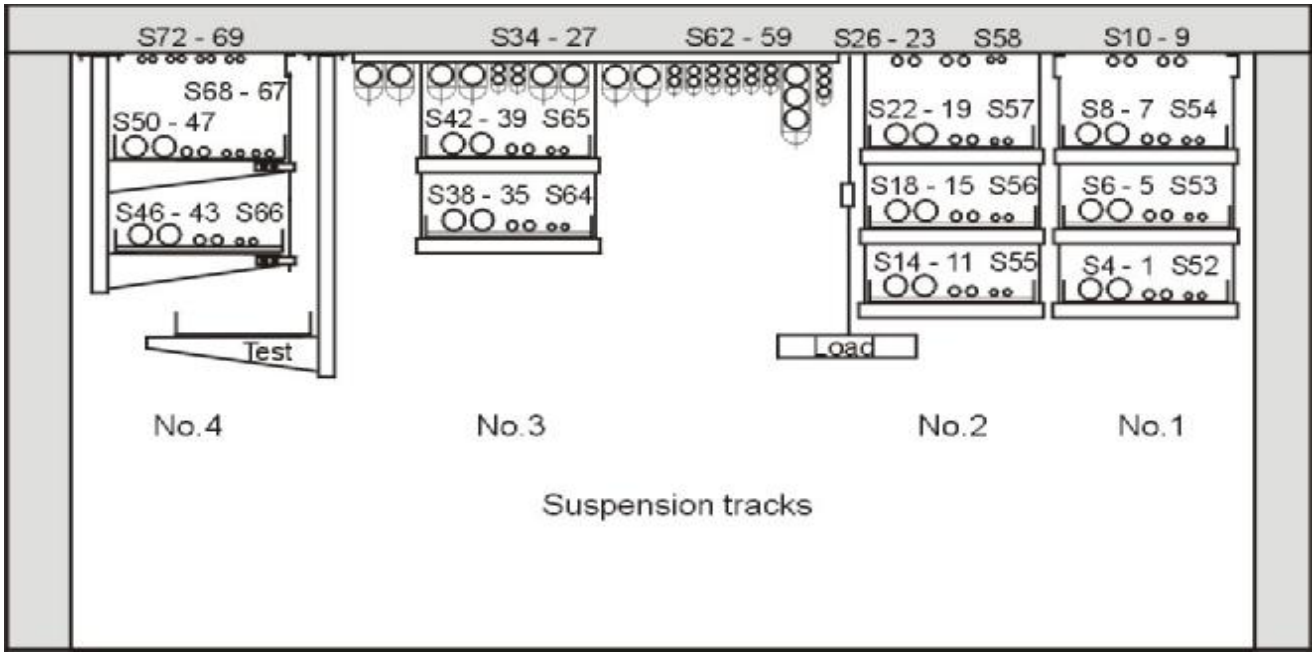
Signal cables were tested by three-phase voltage supply 1 x 110V with LED diods 3V / 0,03W. Circuit breakers with rating 3 A were used.

Layout of cables in the test furnace



Specimens 1, 2: cables (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30	Specimens placed in the trays KCOP 400H60/3N (BAKS). Suspension track No.1
Specimens 3, 4: cables (N)HXCH 4x50/25 RM FE180 PH30/E30	
Specimens 52: cables HLGsekw 2x1,0 FE180 PH90/E30-E90	
Specimen 5: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.1
Specimen 6: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	
Specimens 53: cables HLGs 2x1,0 FE180 PH90/E30-E90	
Specimen 7: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	Specimens placed in the trays KCOP 400H60/3N (BAKS). Suspension track No.1
Specimen 8: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	
Specimens 54: cables HLGs 2x1,0 FE180 PH90/E30-E90	
Specimen 9: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	Specimens placed in ceiling clips UDF (BAKS) in spacing of 600 mm.
Specimen 10: cables (N)HXH 4x1,5 RE FE180 PH90/E90	
Specimens 11, 12: cables (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.2
Specimens 13, 14: cables (N)HXCH 4x50/25 RM FE180 PH30/E30	
Specimens 55: cables HLGsekw 2x1,0 FE180 PH90/E30-E90	
Specimens 15, 16: cables (N)HXH 4x1,5 RE FE180 PH90/E90	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.2
Specimens 17, 18: cables (N)HXH 4x50 RM FE180 PH90/E90	
Specimens 56: cables HDGszo 3x1,5 FE180 PH90/E30-E90	
Specimens 19, 20: cables (N)HXH 4x1,5 RE FE180 PH90/E90	Specimens placed in the trays KCOP 400H60/3N (BAKS). Suspension track No.2
Specimens 21, 22: cables (N)HXH 4x50 RM FE180 PH90/E90	
Specimens 57: cables HDGszo 3x1,5 FE180 PH90/E30-E90	
Specimen 23: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	Specimens placed in ceiling clips UDF (BAKS) in spacing of 600 mm.
Specimen 24: cables (N)HXH 4x50 RM FE180 PH90/E90	
Specimens 58: cables HDGszo 3x1,5 FE180 PH90/E30-E90	
Specimen 25: cables NHXH-J 4x1,5 RE FE180 PH90/E90	Specimens placed in ceiling profile ledges SDOC 1000 with clips UKO2 (BAKS) in spacing of 600 mm.
Specimen 26: cables NHXH-J 4x50 RM FE180 PH90/E90	
Specimen 27: cables (N)HXCH 4x1,5/1,5 RE FE180 PH30/E30	Specimens placed in ceiling profile ledges SDOC 1000 with clips UKO1 (BAKS) in spacing of 600 mm.
Specimen 28: cables (N)HXH 4x1,5 RE FE180 PH30/E30	
Specimen 29: cables (N)HXCH 4x50/25 RM FE180 PH30/E30	
Specimen 30: cables (N)HXH 4x50 RM FE180 PH30/E30	
Specimen 31: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	
Specimen 32: cables (N)HXH 4x1,5 RE FE180 PH90/E90	
Specimen 33: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	
Specimen 34: cables (N)HXH 4x50 RM FE180 PH90/E90	
Specimens 59: cables HLGsekw 2x1,0 FE180 PH90/E30-E90	
Specimens 60: cables HDGsekwzo 3x1,5 FE180 PH90/E30-E90	
Specimens 61: cables HLGs 2x1,0 FE180 PH90/E30-E90	
Specimens 62: cables HDGszo 3x1,5 FE180 PH90/E30-E90	

Layout of cables in the test furnace



Specimens 35, 36: cables (N)HXH 4x1,5 RE FE180 PH30/E30	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.3
Specimens 37, 38: cables (N)HXH 4x50 RM FE180 PH30/E30	
Specimens 64: cables HLGs 2x1,0 FE180 PH90/E30-E90	
Specimens 39, 40: cables (N)HXH 4x1,5 RE FE180 PH30/E30	Specimens placed in the trays KCOP 400H60/3N (BAKS). Suspension track No.3
Specimens 41, 42: cables (N)HXH 4x50 RM FE180 PH30/E30	
Specimens 65: cables HDGsekwzo 3x1,5 FE180 PH90/E30-E90	
Specimens 43, 44: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90	Specimens placed on the ladders DUOP 400H60/3N (BAKS). Suspension track No.4
Specimens 45, 46: cables NHXCH 4x50/25 RM FE180 PH90/E90	
Specimens 66: cables HDGszo 3x1,5 FE180 PH90/E30-E90	
Specimens 47, 48: cables NHXH-J 4x1,5 RE FE180 PH90/E90	Specimens placed in the trays KCOP 400H60/3N (BAKS). Suspension track No.4
Specimens 49, 50: cables NHXH-J 4x50 RM FE180 PH90/E90	
Specimens 67: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	
Specimens 68: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	
Specimens 69: cables HDGsekwzo 3x1,5 FE180 PH90/E30-E90	Specimens placed in ceiling clips UEF (BAKS) in spacing of 600 mm.
Specimens 70: cables HDGszo 3x1,5 FE180 PH90/E30-E90	
Specimens 71: cables HLGsekw 2x1,0 FE180 PH90/E30-E90	
Specimens 72: cables HLGs 2x1,0 FE180 PH90/E30-E90	

Photos taken before the test

Photos taken after the termination of the test

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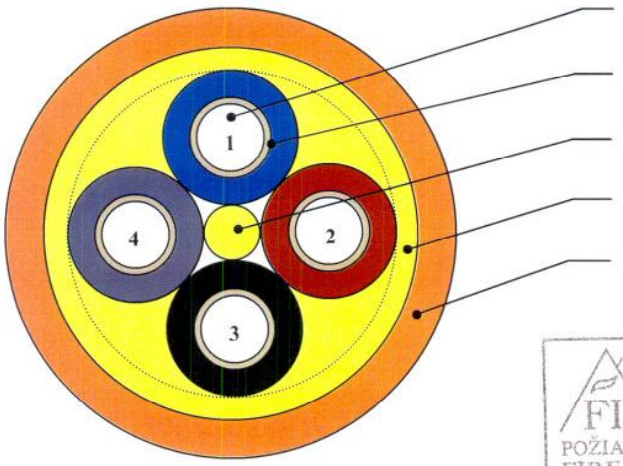
(N)HXH FE180 PH30/E30 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



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Dátum/Date 02.09.2009

Podpis/Signature

Dokument č./Document No. FIRES-FR-054-09-ANNEX

Príloha č./Appendix No. 16

APPLICATIONS

(N)HXH FE180 PH30/E30 0,6/1 kV 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 fire fighting. 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.

CONSTRUCTION

conductor	–	bare copper, solid or stranded, according to PN-EN 60228, EN 60228
insulation	–	double insulation ,cross-linked silicone rubber - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 –HM4, (oxygen index bigger than 35%).

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(N)HXH FE180 PH30/E30 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 30 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
no	mm^2
1	16 ÷ 400
2 - 5	1 ÷ 240
7 – 19	1; 1.5; 2.5 i 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -15 to +90°C
during installation	from -5 to +70°C
Minimum bending radius	12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24, PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266 PN-HD 604 S1

* Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	1 x 16 RE	10	154	238
	1 x 25 RM	12	240	337
	1 x 35 RM	13	336	428
	1 x 50 RM	14	480	551
	1 x 70 RM	16	672	751
	1 x 95 RM	18	912	1049
	1 x 120 RM	19	1152	1299
	1 x 150 RM	21	1440	1617
	1 x 185 RM	23	1776	1950
	1 x 240 RM	27	2304	2597
	2 x 1,5 RE	14	29	252
	2 x 2,5 RE	14	48	299
	2 x 4,0 RE	15	77	356
	2 x 6,0 RE	16	115	423
	2 x 10 RE	18	192	556
	2 x 16 RE	20	307	741
	2 x 25 RM	24	480	879
	3 x 1,5 RE	14	43	299
	3 x 2,5 RE	15	72	337
	3 x 4,0 RE	16	115	413
	3 x 6,0 RE	17	173	499
	3 x 10 RE	19	288	656

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 16 RE	22	461	931
	3 x 25 RM	25	720	1321
				0
	4 x 1,5 RE	15	58	266
	4 x 2,5 RE	16	96	304
	4 x 4,0 RE	17	154	390
	4 x 6,0 RE	18	230	499
	4 x 10 RE	20	384	698
	4 x 16 RM	23	614	1083
	4 x 25 RM	27	960	1539
	4 x 35 RM	29	1344	1948
	4 x 50 RM	32	1920	2607
	5 x 1,5 RE	17	72	309
	5 x 2,5 RE	18	120	385
	5 x 4,0 RE	19	192	485
	5 x 6,0 RE	20	288	618
	5 x 10 RE	22	480	855
	5 x 16 RE	26	768	1292
	5 x 25 RM	30	1200	1900
	5 x 35 RM	32	1680	2423
	5 x 50 RM	37	2400	3381
	7 x 1,5 RE	18	101	356

RE - single wire round conductor;
RM - multiwire round conductor

Other cross-sections and conductor counts available on request.

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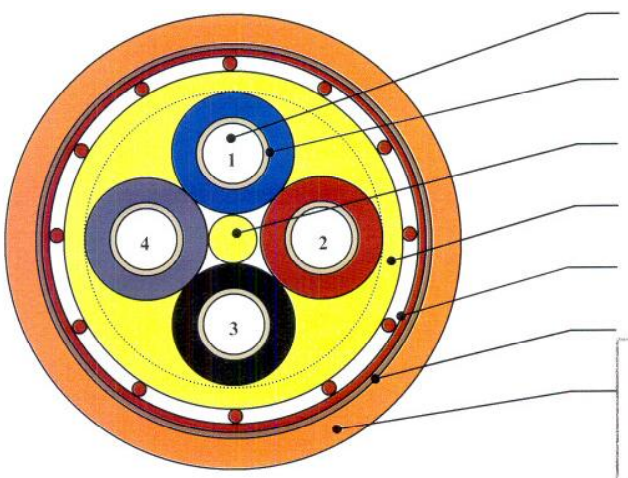
(N)HXCH FE180 PH30/E30 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



conductor
insulation
filler
inner sheath
concentric conductor
separator
sheath

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Dátum/Date 04.04.2009
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Dokument č./Document No. FIRES-FR-054-09-ANNEX

Príloha č./Appendix No. 18

APPLICATIONS

(N)HXCH FE180 PH30/E30 0,6/1 kV 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 fire fighting. 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.

CONSTRUCTION

conductor	–	bare copper, solid or stranded, according to PN-EN 60228, EN 60228,
insulation	–	double insulation ,cross-linked silicone rubber - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
concentric conductor	–	concentric conductor made of bare copper wires and a copper tape binder wrapped over the inner sheath,
separator	–	polyester tape,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 – HM4, (oxygen index bigger than 35%).

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(N)HXCH FE180 PH30/E30 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 30 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
no	mm^2
1	16 ÷ 400
2 - 5	1 ÷ 240
7 – 19	1; 1.5; 2.5 i 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -15 to +90°C
during installation	from -5 to +70°C
Minimum bending radius	12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity*	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266 PN-HD 604 S1

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 1,5RE/1,5	16	66	266
	3 x 2,5 RE/2,5	17	104	352
	3 x 4,0 RE/4,0	18	161	454
	3 x 6,0 RE/6,0	20	240	513
	3 x 10 RE/10	23	408	798
	3 x 16 RE/16	26	643	1159
	3 x 25 RM/16	30	902	1473
	3 x 35 RM/16	33	1190	1862
	3 x 50 RM/25	37	1723	2508
	4 x 1,5RE/1,5	15	81	320
	4 x 2,5 RE/2,5	19	128	475
	4 x 4,0 RE/4,0	20	200	570

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	4 x 6,0 RE/6,0	22	297	732
	4 x 10 RE/10	25	504	1083
	4 x 16 RE/16	26	796	1273
	4 x 25 RM/16	32	1146	1995
	4 x 35 RE/16	35	1528	2480
	4 x 50 RM/25	35	2205	2950
	7 x 1,5RE/2,5	20	133	456
	7 x 2,5 RE/2,5	21	200	561
	12 x 1,5RE/2,5	25	205	698
	12 x 2,5 RE/4,0	27	334	903

RE - single wire round conductor;
RM - multiwire round conductor

Other cross-sections and conductor counts available on request.

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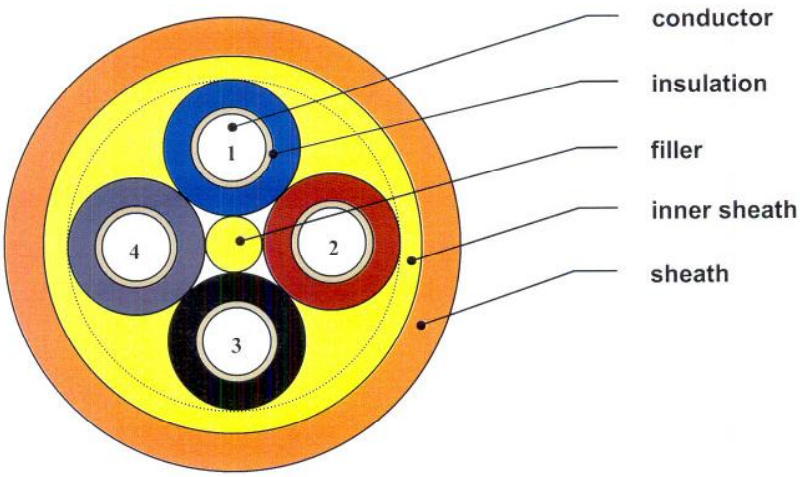
(N)HXH FE180 PH90/E90 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

(N)HXH FE180 PH90/E90 0,6/1 kV 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 fire fighting. 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.

CONSTRUCTION

conductor	–	bare copper, solid or stranded, according to PN-EN 60228, EN 60228,
insulation	–	double insulation ,cross-linked silicone rubber - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 –HM4, (oxygen index bigger than 35%).

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Prílohy č./Appendix No. 20

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(N)HXH FE180 PH90/E90 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
no	mm^2
1	16 ÷ 400
2 - 5	1 ÷ 240
7 – 19	1; 1.5; 2.5 i 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -15 to +90°C
during installation	from -5 to +70°C
Minimum bending radius	12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

* Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	1 x 16 RE	10	154	250
	1 x 25 RM	12	240	355
	1 x 35 RM	13	336	450
	1 x 50 RM	14	480	580
	1 x 70 RM	16	672	790
	1 x 95 RM	18	912	1070
	1 x 120 RM	19	1152	1325
	1 x 150 RM	21	1440	1650
	1 x 185 RM	23	1776	1990
	1 x 240 RM	27	2304	2650
	2 x 1,5 RE	14	29	265
	2 x 2,5 RE	14	48	315
	2 x 4,0 RE	15	77	375
	2 x 6,0 RE	16	115	445
	2 x 10 RE	18	192	585
	2 x 16 RE	20	307	780
	2 x 25 RM	24	480	925
	3 x 1,5 RE	14	43	315
	3 x 2,5 RE	15	72	355
	3 x 4,0 RE	16	115	435
	3 x 6,0 RE	17	173	525
	3 x 10 RE	19	288	690

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 16 RE	22	461	980
	3 x 25 RM	25	720	1390
	4 x 1,5 RE	15	58	280
	4 x 2,5 RE	16	96	320
	4 x 4,0 RE	17	154	410
	4 x 6,0 RE	18	230	525
	4 x 10 RE	20	384	735
	4 x 16 RM	23	614	1140
	4 x 25 RM	27	960	1620
	4 x 35 RM	29	1344	2050
	4 x 50 RM	32	1920	2660
	5 x 1,5 RE	17	72	325
	5 x 2,5 RE	18	120	405
	5 x 4,0 RE	19	192	510
	5 x 6,0 RE	20	288	650
	5 x 10 RE	22	480	900
	5 x 16 RE	26	768	1360
	5 x 25 RM	30	1200	2000
	5 x 35 RM	32	1680	2550
	5 x 50 RM	37	2400	3450
	7 x 1,5 RE	18	101	375

RE - single wire round conductor;
RM - multiwire round conductor
Other cross-sections and conductor counts available on request.

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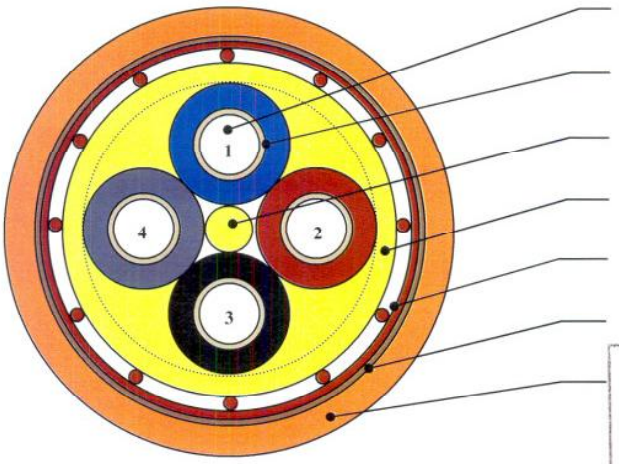
(N)HXCH FE180 PH90/E90 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



conductor
insulation
filler
inner sheath
concentric conductor
separator
sheath

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Dátum/Date 04.09.2009
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Dokument č. Document No. FIRES-FR-054-09-ANNEX

Príloha č./Appendix No. 22

APPLICATIONS

(N)HXCH FE180 PH90/E90 0,6/1 kV 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 fire fighting. 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.

CONSTRUCTION

conductor	–	bare copper, solid or stranded according to PN-EN 60228, EN 60228,
insulation	–	double insulation ,cross-linked silicone rubber - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
concentric conductor	–	concentric conductor made of bare copper wires and a copper tape binder wrapped over the inner sheath,
separator	–	polyester tape,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 – HM4, (oxygen index bigger than 35%).

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CE RoHS

ISO 9001:2000

(N)HXCH FE180 PH90/E90 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
no	mm^2
1	16 ÷ 400
2 - 5	1 ÷ 240
7 – 19	1; 1.5; 2.5 i 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -15 to +90°C
during installation	from -5 to +70°C
Minimum bending radius	12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24, PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266 PN-HD 604 S1

* Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 1,5RE/1,5	16	66	280
	3 x 2,5 RE/2,5	17	104	370
	3 x 4,0 RE/4,0	18	161	478
	3 x 6,0 RE/6,0	20	240	540
	3 x 10 RE/10	23	408	840
	3 x 16 RE/16	26	643	1220
	3 x 25 RM/16	30	902	1550
	3 x 35 RM/16	33	1190	1960
	3 x 50 RM/25	37	1723	2640
	4 x 1,5RE/1,5	17	81	350
	4 x 2,5 RE/2,5	19	128	500
	4 x 4,0 RE/4,0	20	200	600

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	4 x 6,0 RE/6,0	22	297	770
	4 x 10 RE/10	25	504	1140
	4 x 16 RE/16	26	796	1340
	4 x 25 RM/16	32	1146	2100
	4 x 35 RE/16	35	1528	2610
	4 x 50 RM/25	36	2205	2995
	7 x 1,5RE/2,5	20	133	480
	7 x 2,5 RE/2,5	21	200	590
	12 x 1,5RE/2,5	25	205	735
	12 x 2,5 RE/4,0	27	334	950

RE - single wire round conductor;
RM - multiwire round conductor

Other cross-sections and conductor counts available on request.

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Dátum/Date 02.09.2009

Podpis/Signature

Dokument č./Document No. FIRES-FR-054-09-AWE

Príloha č./Appendix No. 23

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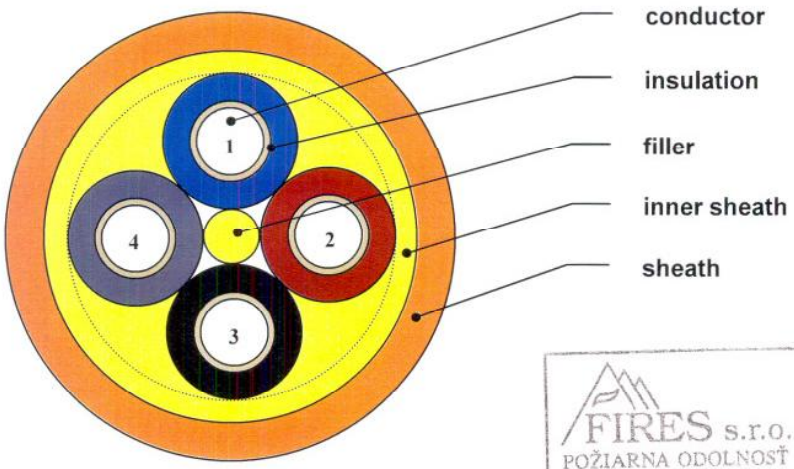
NHXH FE180 PH90/E90 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



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FIRE RESISTANCE

Dátum/Date 04.09.2009

Podpis/Signature

Dokument č./Document No. FIRES-FR-058-09-ANNE

Príloha č./Appendix No. 24

APPLICATIONS

NHXH FE180 PH90/E90 0,6/1 kV 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 fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are certified by Scientific and Research Development Centre for Fire Protection (Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej) at Józefów – **Certificate of Conformity No. 2412/2007**.

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor	–	bare copper, solid or stranded, according to PN-EN 60228, EN 60228,
insulation	–	mica tape and halogen free cross-linked compound insulation - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 –HM4, (oxygen index bigger than 35%).

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ISO 9001:2000

NHXH FE180 PH90/E90 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
no	mm^2
1	16 ÷ 400
2 - 5	1 ÷ 240
7 – 19	1; 1.5; 2.5 i 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -15 to +90°C
during installation	from -5 to +70°C
Minimum bending radius	12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

* Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	1 x 6,0 RE	8,4	58	125
	1 x 10 RE	9,4	96	170
	1 x 16 RE	10,4	154	250
	1 x 25 RM	12,4	240	355
	1 x 35 RM	13,4	336	450
	1 x 50 RM	14,5	480	580
	1 x 70 RM	16,4	672	790
	1 x 95 RM	18,1	912	1040
	1 x 120 RM	19,7	1152	1275
	1 x 150 RM	21,7	1440	1600
	1 x 185 RM	23,6	1776	1970
	1 x 240 RM	27,0	2304	2500
	2 x 1,5 RE	14,0	29	265
	2 x 2,5 RE	14,8	48	315
	2 x 4,0 RE	15,7	77	375
	2 x 6,0 RE	16,7	115	445
	2 x 10 RE	18,4	192	585
	2 x 16 RE	20,4	307	780
	2 x 25 RM	24,0	480	925
	3 x 1,5 RE	14,9	43	315
	3 x 2,5 RE	15,5	72	355
	3 x 4,0 RE	16,5	115	435
	3 x 6,0 RE	17,6	173	525

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 10 RE	19,3	288	690
	3 x 16 RE	22,0	461	980
	3 x 25 RM	25,5	720	1390
	4 x 1,5 RE	15,7	58	350
	4 x 2,5 RE	16,7	96	420
	4 x 4,0 RE	17,8	154	510
	4 x 6,0 RE	19,0	230	625
	4 x 10 RE	20,9	384	835
	4 x 16 RM	23,7	614	1140
	4 x 25 RM	27,8	960	1720
	4 x 35 RM	29,5	1344	2050
	4 x 50 RM	32,7	1920	2660
	5 x 1,5 RE	17,2	72	425
	5 x 2,5 RE	18,2	120	505
	5 x 4,0 RE	19,3	192	610
	5 x 6,0 RE	20,7	288	750
	5 x 10 RE	22,7	480	1000
	5 x 16 RE	26,3	768	1460
	5 x 25 RM	30,6	1200	2100
	5 x 35 RM	32,9	1680	2550
	5 x 50 RM	37,7	2400	3550
	7 x 1,5 RE	18,1	101	475

RE - single wire round conductor;
RM - multiwire round conductor

Other cross-sections and conductor counts available on request.

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NHXCH FE180 PH90/E90 0,6/1 kV

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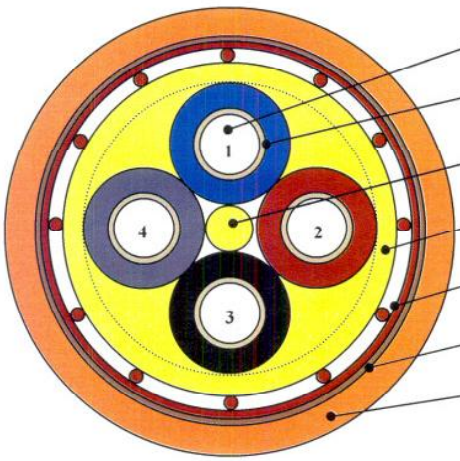

conductor
insulation
filler
inner sheath
concentric conductor
separator
sheath

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POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

Dátum/Date 01.04.2009

Podpis/Signature

Dokument č./Document No. FIRES-FR-054-09-ANNE

Príloha č./Appendix No. 26

APPLICATIONS

NHXCH FE180 PH90/E90 0,6/1 kV 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 fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

The cables are certified by Scientific and Research Development Centre for Fire Protection (Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej) at Józefów – **Certificate of Conformity No. 2412/2007**.

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor	–	bare copper, solid or stranded according to PN-EN 60228, EN 60228,
insulation	–	mica tape and halogen free cross-linked compound insulation - colours in accordance with PN-HD 308,
filler	–	filler made of halogen free compound,
inner sheath	–	inner sheath made of halogen free compound,
concentric conductor	–	concentric conductor made of bare copper wires and a copper tape binder wrapped over the inner sheath,
separator	–	polyester tape,
sheath	–	orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 – HM4, (oxygen index bigger than 35%).

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NHXCH FE180 PH90/E90 0,6/1 kV

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor cross-section	
Number of conductors	Nominal conductor cross-section
no	mm^2
1	16 ÷ 400
2 - 5	1 ÷ 240
7 – 19	1; 1.5; 2.5 i 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV
Voltage test	4.0 kV rms
Insulation resistivity at 90°C, minimum	1 x 10^{11} Ω·cm
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from -15 to +90°C
during installation	from -5 to +70°C
Minimum bending radius	12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24, PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266 PN-HD 604 S1

* Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 1,5RE/1,5	16,6	43,2	360
	3 x 2,5 RE/2,5	17,7	72	430
	3 x 4,0 RE/4,0	18,8	115	520
	3 x 6,0 RE/6,0	20,8	173	660
	3 x 10 RE/10	23,8	288	940
	3 x 16 RE/16	26,2	461	1340
	3 x 25 RM/16	30,4	720	1750
	3 x 35 RM/16	33,0	1190	2160
	3 x 50 RM/25	37,0	1723	2840
	4 x 1,5RE/1,5	16,8	81	390
	4 x 2,5 RE/2,5	19,0	96	500
	4 x 4,0 RE/4,0	20,1	154	600

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	4 x 6,0 RE/6,0	22,3	230	770
	4 x 10 RE/10	25,1	384	1140
	4 x 16 RE/16	26,2	614	1340
	4 x 25 RM/16	32,8	960	2100
	4 x 35 RE/16	35,6	1498	2610
	4 x 50 RM/25	35,4	2160	2950
	7 x 1,5RE/2,5	20,7	101	580
	7 x 2,5 RE/2,5	21,9	168	690
	12 x 1,5RE/2,5	25,9	101	935
	12 x 2,5 RE/4,0	27,9	168	1150

RE - single wire round conductor;
RM - multiwire round conductor

Other cross-sections and conductor counts available on request.

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FIRE RESISTANCE

Dátum/Date 04.09.2009
Podpis/Signature

Dokument č./Document No. FIRES-FR-054-09-ANNEX

Príloha č./Appendix No. 2

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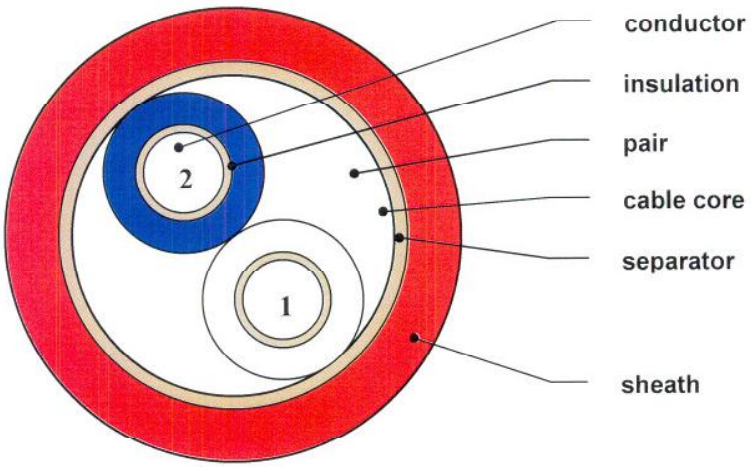
HTKSH FE180 PH90/E30-E90

FIRE RESISTANT HALOGEN FREE CABLES



APPLICATIONS

HTKSH FE180 PH90/E30-E90 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 fire fighting (e.g. emergency lighting). 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 installations.

CONSTRUCTION

conductor	–	bare copper, solid,
insulation	–	mica tape and halogen free compound insulation - colours in accordance with PN-92/T-90321 standard,
pair	–	insulated conductors twisted into pairs,
cable core	–	pairs laid-up into a cable core,
separator	–	polyester tape,
sheath	–	red, cable sheath made of halogen free compound according to EN 50290-2-27 and VDE 0250-214 – HM2, (oxygen index bigger than 35%).

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HTKSH FE180 PH90/E30-E90

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor diameter		mm	0.8	1.0	1.4	1.8	2.3	2.8
Conductor cross-section		mm^2	0.5	0.75	1.5	2.5	4	6
DC loop resistance at 20°C, maximum		Ω/km	75	48	24.5	14.9	9.3	6.3
Capacitance between conductors at 1 kHz	maximum	nF/km	120	120	120	120	120	120
	average		60	70	70	70	100	100

Operating voltage	240 V
Voltage test	1.5 kV rms
Insulation resistance, minimum	100 MΩ·km
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from - 30 to + 80°C
during installation	from - 5 to + 70°C
Minimum bending radius	10 x cable diameter
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2
Circuit integrity *	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	WT-TK-43 PN-92/T-90320 PN-92/T-90321

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Cable type	Number of pairs (x 2) x conductor diameter	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm	mm	kg/km	kg/km
HTKSH FE180 PH90/E30-E90	1 x 2 x 0.8	6.5	10	61

Other diameters and conductor counts available on request.

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FIRE RESISTANCE

Dátum/Date 02.04.2009

Podpis/Signature

Dokument č./Document No. FIRES-FR-054-04-PAVE

Príloha č./Appendix No. 29

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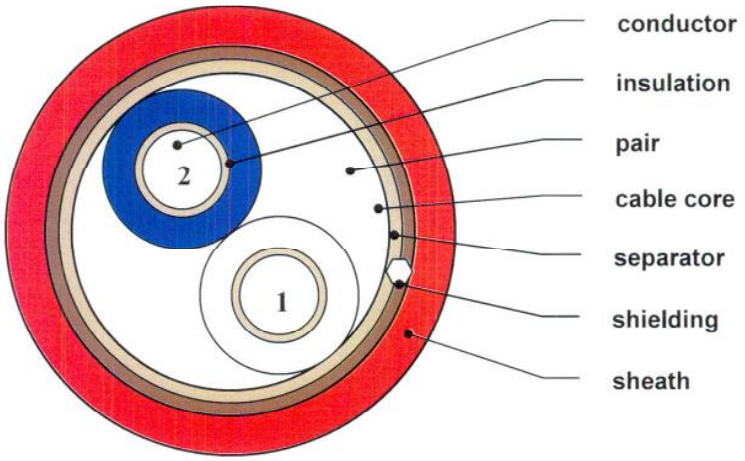
HTKSHekw FE180 PH90/E30-E90

FIRE RESISTANT HALOGEN FREE CABLES



APPLICATIONS

HTKSHekw FE180 PH90/E30-E90 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 fire fighting (e.g. emergency lighting). The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

Cable circuits are protected by an overall electrostatic shield against external electric field interferences.

The cables are suitable for indoor installations.

CONSTRUCTION

conductor	–	bare copper, solid,
insulation	–	mica tape and halogen free compound insulation - colours in accordance with PN-92/T-90321 standard,
pair	–	insulated conductors twisted into pairs,
cable core	–	pairs laid-up into a cable core,
separator	–	polyester tape,
shielding	–	overall electrostatic shield incorporating a plastic laminated metal foil and a tinned copper drain wire Ø 0.8 mm,
sheath	–	red, cable sheath made of halogen free compound according to EN 50290-2-27 and VDE 0250-214 – HM2, (oxygen index bigger than 35%).

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TECHNOKABEL®

ISO 9001:2000

HTKSHekw FE180 PH90/E30-E90

CHARACTERISTICS

The cables maintain their functions for 90 minutes, meeting requirements of DIN 4102-12 and PN-EN 50200 standards

Conductor diameter		mm	0.8	1.0	1.4	1.8	2.3	2.8
Conductor cross-section		mm^2	0.5	0.75	1.5	2.5	4	6
DC loop resistance at 20°C, maximum		Ω/km	75	48	24.5	14.9	9.3	6.3
Capacitance between conductors at 1 kHz	maximum	nF/km	200	200	200	200	200	200
	average		90	130	130	130	150	150

Operating voltage	240 V
Voltage test	1.5 kV rms
Insulation resistance, minimum	100 MΩ·km
Inductance, approximate	0.7 mH/km
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2	
pH, approximate	6.8
conductivity, approximate	0.4 µS/mm
Smoke density per PN-EN 50268-2-3, IEC 61034-2	
light transmittance, minimum	94%

Operating temperature range	
during operation	from - 30 to + 80°C
during installation	from - 5 to + 70°C
Minimum bending radius	10 x cable diameter
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2
Circuit integrity *	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	WT-TK-43 PN-92/T-90320 PN-92/T-90321

*Circuit integrity is dependent on installation method.

CE = the cable meets requirements of the low voltage directive 2006/95/WE

Cable type	Number of pairs (x 2) x conductor diameter	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm	mm	kg/km	kg/km
HTKSHekw FE180 PH90/E30-E90	1 x 2 x 0.8	7.4	15	66

Other diameters and conductor counts available on request.

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FIRE RESISTANCE

Dátum/Date 04.05.2009

Podpis/Signature

Dokument č. / Document No. FIRES-FR-054-09-AUNE

Príloha č./Appendix No. 31

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CE RoHS ISO 9001:2000

HDGs(żo) FE180 PH90/E30-E90, HDGsekw(żo) FE180 PH90/E30-E90
HLGs(żo) FE180 PH90/E30-E90, HLGsekw(żo) FE180 PH90/E30-E90

PRZEWODY ELEKTROENERGETYCZNE OGNIOODPORNE, BEZHALOGENOWE

ZASTOSOWANIE

Przewody elektroenergetyczne ognioodporne i bezhalogenowe typu **HDGs(żo) FE180 PH90/E30-E90 300/500 V, HLGs(żo) FE180 PH90/E30-E90 300/500 V** i ekranowane typu **HDGsekw(żo) FE180 PH90/E30-E90 300/500 V, HLGsekw(żo) FE180 PH90/E30-E90 300/500 V**, przeznaczone są do zasilania instalacji w obiektach o podwyższonych wymaganiach przeciwpożarowych. tj. zapewnienie dopływu energii elektrycznej do urządzeń, których działanie jest niezbędne podczas pożaru oraz jego gaszenia. Kable nie rozprzestrzeniają płomienia, emisja dymu jest bardzo niska, a emitowane gazy są nietoksyczne i niekorozyjne. Przewody zaleca się stosować w instalacjach oświetlenia awaryjnego, systemach oddymiana oraz mogą być stosowane w systemach alarmowych, sygnalizacyjnych, kontrolnych, DSO i innych urządzeniach przeciwpożarowych, których działanie przewidziane jest w warunkach pożaru.

W przypadku kabli ekranowanych **(ekw)** wspólny ekran statyczny chroni kabel przed zakłóceniami indukowanymi przez zewnętrzne pola elektryczne.

Kable bezhalogenowe używane są tam, gdzie potrzebne jest większe bezpieczeństwo ludzi i kosztownych urządzeń elektronicznych na wypadek pożaru.

W przypadku pożaru, **kable te zapewniają podtrzymanie funkcji kabla** (tj. zapewnienie transmisji danych oraz dopływu energii elektrycznej do urządzeń, które muszą funkcjonować w warunkach pożaru oraz podczas jego gaszenia np. instalacje oświetlenia awaryjnego). Kable nie rozprzestrzeniają płomienia, emisja dymu jest bardzo niska, a emitowane gazy są nietoksyczne i niekorozyjne.

BUDOWA

- żyły jednodrutowe **(D)** lub wielodrutowe **(L)** z miękkich drutów miedzianych gołych lub ocynowanych, klasy 1,2 lub 5 wg PN-EN 60228,
- izolacja żył wykonana ze specjalnej usieciowanej gumy silikonowej,
- kolory izolacji żył wg normy PN-HD 308 S2,

Liczba żył	Barwy izolacji żył w przewodzie	
	z żyłą ochronną (żo)	bez żyły ochronnej
2	-	niebieska i brązowa
3	zielono-zółta, niebieska, brązowy	brązowa, czarna i szara
4	zielono-zółta, niebieska, brązowa, czarna	czarna, niebieska i brązowa
5	zielono-zółta, niebieska, brązowa, czarna, szara	czarna, niebieska, brązowa, czarna i czarna
powyżej 5 żył	żyły numerowane	

- żyły izolowane skręcone razem w warstwy o przeciwnych kierunkach skrętu,
- ośrodek kabla owinięty taśmą poliestrową dla przewodów HDGsekw i HLGsekw,
- ekran statyczny dla przewodów HDGsekw i HLGsekw z laminowanej tworzywem folii aluminiowej, z ocynowaną żyłą uziemiającą,
- powłoka kabla wykonana z tworzywa bezhalogenowego, w kolorze czerwonym.

TECHNOKABEL®

CE RoHS ISO 9001:2000

HDGs(żo) FE180 PH90/E30-E90, HDGsekw(żo) FE180 PH90/E30-E90
HLGs(żo) FE180 PH90/E30-E90, HLGsekw(żo) FE180 PH90/E30-E90

DANE TECHNICZNE

Kable zapewniają podtrzymanie funkcji elektrycznych instalacji przez 90 minut przy napięciu znamionowym:
- **300/500 V wg PN-EN 50200 lub EN 50362,**
- **110 V wg DIN 4102-12**

Średnica żyły (klasa 1 lub 2), około	mm	1,0	1,1	1,4	1,8	2,3	2,8
Przekrój żyły (klasa 5)	mm^2	0,75	1	1,5	2,5	4	6
Maksymalna rezystancja żył w temp. 20℃	Ω/km	26,0	19,5	13,3	7,98	4,95	3,30
Pojemność pomiędzy żyłami przy 1 kHz, – maksymalna	nF/km	120	120	120	120	120	120
– średnia		70	70	80	80	100	100

Napięcie pracy U_o/U	300/500 V
Próba napięciowa	2 kV sk
Minimalna rezystancja izolacji w temp. 20℃	100 MΩ·km
Indukcyjność, około	0,7 mH/km
Maksymalna dopuszczalna temperatura przy żyle	
w warunkach pracy	+ 85℃
przy zwarciu (max.5 s)	+ 250℃
Zakres temperatur pracy	
podczas pracy	od - 25 do + 85℃
podczas układania	od -10 do + 50℃
Minimalny promień gięcia	
kable jednożyłowe	10 x średnica kabla
kable wielożyłowe	6 x średnica kabla

Korozyjność wydziel. gazów	PN-EN 50267-2-3, IEC 60754-2
pH, min.	4,3
konduktywność, max.	10 µS/cm
Gęstość dymu	PN-EN 61034-2
przepuszczalność światła, min.	70 %
Palność kabla	nie rozprzestrzeniający płomienia
Próby palności	PN-EN 50266-2-2, IEC 60332-3-22 (cat.A)
Podtrzymanie funkcji:	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 lub EN 50362
Trwałość izolacji FE180	IEC 60331-21; IEC 60331-11
Wykonanie wg normy	WT-TK-46

Instalacja kabla - powinna być przeprowadzona na certyfikowanym systemie prowadzenia kabli. Zalecamy stosowanie tylko certyfikowanych systemów nośnych wg normy DIN 4102 cześć 12. Obecnie posiadamy badania przeprowadzone na systemach firm BAKS.
Odstępy pomiędzy podporami dla koryt i drabinek nie mogą być większe niż 1500 mm
Odstępy pomiędzy instalowanymi uchwytami i obejmami co 300 lub 600 mm.

CE = przewód spełnia wymagania dyrektywy niskonapięciowej 2006/95/WE

Symbol wyrobu	Liczba x średnica żył	Średnica zewnętrzna (około)	Indeks miedziowy	Masa kabla (około)
	mm	mm	kg/km	kg/km
HDGs	2 x 0,75	6,4	14,4	50
HDGs	2 x 1	6,6	19,2	55
HDGs	2 x 1,5	7,5	28,8	75
HDGs	2 x 2,5	8,9	48	105
HDGs	2 x 4	9,8	77	140
HDGs	2 x 6	11,6	115	200
HDGs	3 x 0,75	7,1	21,6	68
HDGs	3 x 1	7,2	28,8	70
HDGs	3 x 1,5	8,2	43,2	95
HDGs	3 x 2,5	9,7	72	140
HDGs	3 x 4	10,9	115	200
HDGs	3 x 6	12,8	173	280
HDGs	4 x 0,75	6,4	28,8	60
HDGs	4 x 1	7,6	38,4	90
HDGs	4 x 1,5	8,9	58	125

Symbol wyrobu	Liczba x średnica żył	Średnica zewnętrzna (około)	Indeks miedziowy	Masa kabla (około)
	mm	mm	kg/km	kg/km
HDGs	4 x 2,5	10,4	96	185
HDGs	4 x 4	11,5	154	250
HDGs	4 x 6	13,7	230	360
HDGs	5 x 0,75	6,5	36	68
HDGs	5 x 1	8,5	48	110
HDGs	5 x 1,5	9,9	72	155
HDGs	5 x 2,5	11,4	120	220
HDGs	5 x 4	12,6	192	305
HDGs	5 x 6	15,1	288	450
HLGs	2 x 1	6,8	19,2	55
HLGsekw	2 x 1	7,0	19,2	65
HDGsekw	2 x 1	6,8	19,2	55

Na zamówienie klienta wykonujemy przewody o innych średnicach i innej liczbie żył.

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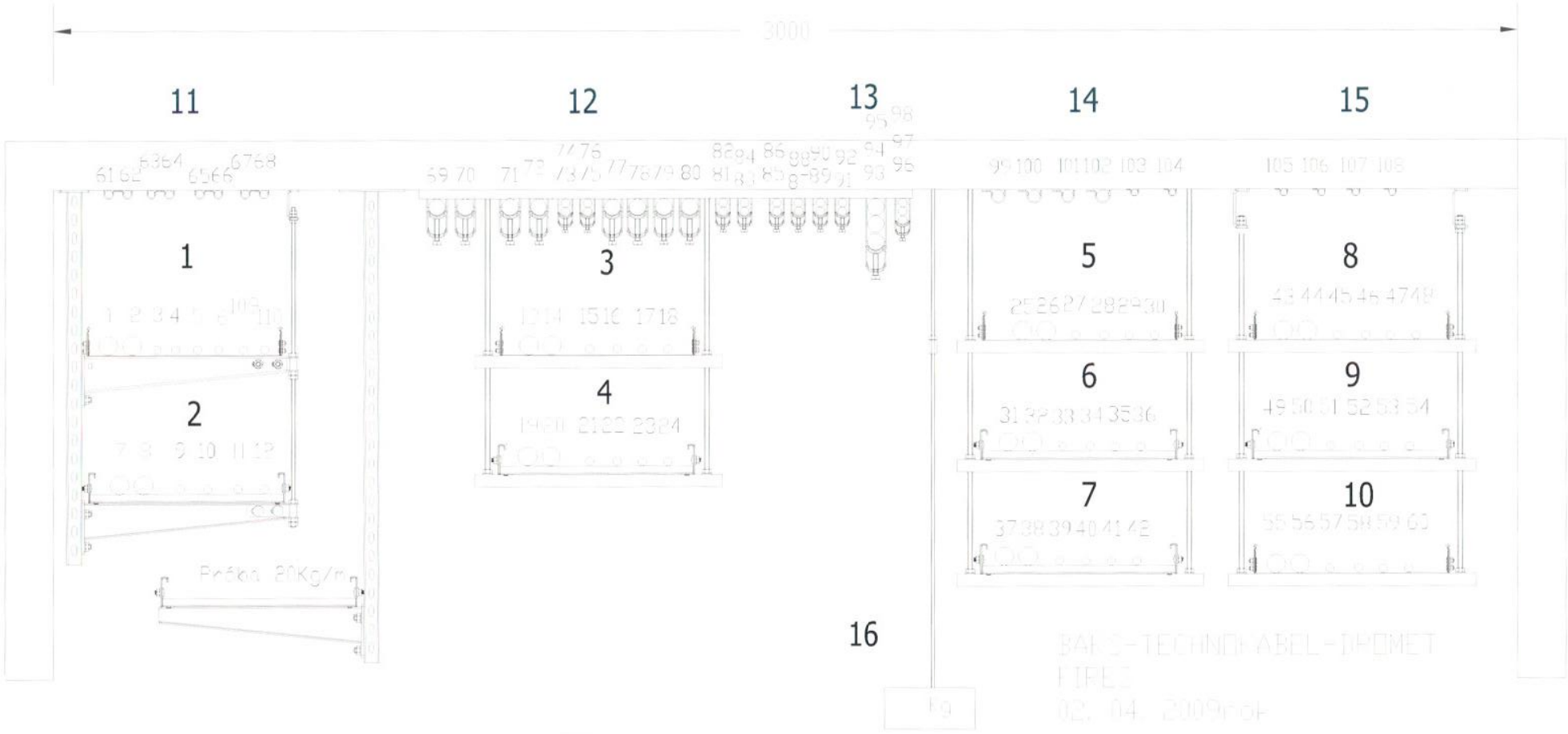

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Profesjonalne Systemy Trass Kablowych

Badanie trasy kablowej BAKS - TECHNOKABEL - DROMET
Badanie w FIRES Słowacja Data 30.03-02.04.2009

Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
1			NHXH-J 4x50 RM FE180 PH90/E90	1	Korytko kablowe KCOP 400H60/... B-400 1.2 m /10kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wysięgnik WMCO400 , pręt gwintowany PGM10/..., do betonu za pomocą stalowego łącznika rozporowego PSRn M10x85 firmy Dromet.
2			NHXH-J 4x50 RM FE180 PH90/E90		
3			NHXH-J 4x1,5 RE FE180 PH90/E90		
4			NHXH-J 4x1,5 RE FE180 PH90/E90		
5			HTKSH FE180 PH90/E30-E90 1x2x0,8		
6			HTKSH FE180 PH90/E30-E90 1x2x0,8		
109			HTKSHekw FE180 PH90/E30-E90 1x2x0,8		
110			HTKSHekw FE180 PH90/E30-E90 1x2x0,8		
7			NHXCH 4x50/25 RM FE180 PH90/E90	2	Drabinka kablowa DUOP 400H60/... B-400/ 1.2 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wysięgnik WMCO400 , pręt gwintowany PGM10/..., do betonu za pomocą stalowego łącznika rozporowego PSRn M10x85 firmy Dromet.
8			NHXCH 4x50/25 RM FE180 PH90/E90		
9			NHXCH 4x1,5/1,5 RE FE180 PH90/E90		
10			NHXCH 4x1,5/1,5 RE FE180 PH90/E90		
11			HDGszo 3x1,5 RE FE180 PH90/E30-E90		
12			HDGszo 3x1,5 RE FE180 PH90/E30-E90		
13			(N)HXH 4x50 RM FE180 PH30/E30	3	Korytko kablowe KCOP 400H60/... B-400 1.2 m /10kg/m / grubość blachy 1,5 mm Mocowanie : pręt gwintowany PGM10/.., ceownik CWOP 40H40/05, do betonu za pomocą tulei rozporowej TRS M10x40 firmy Dromet.
14			(N)HXH 4x50 RM FE180 PH30/E30		
15			(N)HXH 4x1,5 RE FE180 PH30/E30		
16			(N)HXH 4x1,5 RE FE180 PH30/E30		
17			HDGsekwżo 3x1,5 RE FE180 PH90/E30-E90		
18			HDGsekwżo 3x1,5 RE FE180 PH90/E30-E90		
19			(N)HXH 4x50 RM FE180 PH30/E30	4	Drabinka kablowa DGOP 400H60/... B-400/ 1.2 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : pręt gwintowany PGM10/.., ceownik CWOP 40H40/05, do betonu za pomocą tulei rozporowej TRS M10x40 firmy Dromet.
20			(N)HXH 4x50 RM FE180 PH30/E30		
21			(N)HXH 4x1,5 RE FE180 PH30/E30		
22			(N)HXH 4x1,5 RE FE180 PH30/E30		
23			HLGs 2x1,0 FE180 PH90/E30-E90		
24			HLGs 2x1,0 FE180 PH90/E30-E90		
25			(N)HXH 4x50 RM FE180 PH90/E90	5	Korytko kablowe KCOP 400H60/... B-400 1.2 m /10kg/m / grubość blachy 1,5 mm Mocowanie : pręt gwintowany PGM10/.., ceownik CWOP 40H40/05, do betonu za pomocą tulei rozporowej TRS M10x40 firmy Dromet.
26			(N)HXH 4x50 RM FE180 PH90/E90		
27			(N)HXH 4x1,5 RE FE180 PH90/E90		
28			(N)HXH 4x1,5 RE FE180 PH90/E90		
29			HDGszo 3x1,5 RE FE180 PH90/E30-E90		
30			HDGszo 3x1,5 RE FE180 PH90/E30-E90		
31			(N)HXH 4x50 RM FE180 PH90/E90	6	Drabinka kablowa DGOP 400H60/... B-400/ 1.2 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : pręt gwintowany PGM10/.., ceownik CWOP 40H40/05, do betonu za pomocą tulei rozporowej TRS M10x40 firmy Dromet.
32			(N)HXH 4x50 RM FE180 PH90/E90		
33			(N)HXH 4x1,5 RE FE180 PH90/E90		
34			(N)HXH 4x1,5 RE FE180 PH90/E90		
35			HDGszo 3x1,5 RE FE180 PH90/E30-E90		
36			HDGszo 3x1,5 RE FE180 PH90/E30-E90		
37			(N)HXCH 4x50/25 RM FE180 PH30/E30	7	Drabinka kablowa DGOP 400H60/... B-400/ 1.2 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : pręt gwintowany PGM10/.., ceownik CWOP 40H40/05, do betonu za pomocą tulei rozporowej TRS M10x40 firmy Dromet.
38			(N)HXCH 4x50/25 RM FE180 PH30/E30		
39			(N)HXCH 4x1,5/1,5 RE FE180 PH30/E30		
40			(N)HXCH 4x1,5/1,5 RE FE180 PH30/E30		

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Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
41			HLGsekw 2x1,0 FE180 PH90/E30-E90		
42			HLGsekw 2x1,0 FE180 PH90/E30-E90		
43			(N)HXCH 4x50/25 RM FE180 PH90/E90	8	Korytko kablowe KCOP 400H60/... B-400 1.2 m /10kg/m / grubość blachy 1,5 mm Mocowanie : pręt gwintowany PGM10/.., ceownik CWOP 40H40/05, uchwyt USOV do betonu za pomocą stalowego łącznika rozporowego PSRn M10x85 firmy Dromet.
44			(N)HXCH 4x50/25 RM FE180 PH90/E90		
45			(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90		
46			(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90		
47			HLGs 2x1,0 FE180 PH90/E30-E90		
48			HLGs 2x1,0 FE180 PH90/E30-E90		
49			(N)HXCH 4x50/25 RM FE180 PH90/E90	9	Drabinka kablowa DGOP 400H60/... B-400/ 1.2 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : pręt gwintowany PGM10/.., ceownik CWOP 40H40/05, uchwyt USOV do betonu za pomocą stalowego łącznika rozporowego PSRn M10x85 firmy Dromet.
50			(N)HXCH 4x50/25 RM FE180 PH90/E90		
51			(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90		
52			(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90		
53			HLGs 2x1,0 FE180 PH90/E30-E90		
54			HLGs 2x1,0 FE180 PH90/E30-E90		
55			(N)HXCH 4x50/25 RM FE180 PH30/E30	10	Korytko kablowe KCOP 400H60/... B-400 1.2 m /10kg/m / grubość blachy 1,5 mm Mocowanie : pręt gwintowany PGM10/.., ceownik CWOP 40H40/05, uchwyt USOV do betonu za pomocą stalowego łącznika rozporowego PSRn M10x85 firmy Dromet.
56			(N)HXCH 4x50/25 RM FE180 PH30/E30		
57			(N)HXCH 4x1,5/1,5 RE FE180 PH30/E30		
58			(N)HXCH 4x1,5/1,5 RE FE180 PH30/E30		
59			HLGsekw 2x1,0 FE180 PH90/E30-E90		
60			HLGsekw 2x1,0 FE180 PH90/E30-E90		
61			HLGs 2x1,0 FE180 PH90/E30-E90	11	Uchwyty kablowe UEF. Mocowanie do betonu co 600mm za pomocą kołka SRO M6x30
62			HLGs 2x1,0 FE180 PH90/E30-E90		
63			HLGsekw 2x1,0 FE180 PH90/E30-E90		
64			HLGsekw 2x1,0 FE180 PH90/E30-E90		
65			HDGszo 3x1,5 RE FE180 PH90/E30-E90		
66			HDGszo 3x1,5 RE FE180 PH90/E30-E90		
67			HDGsekwżo 3x1,5 RE FE180 PH90/E30-E90		
68			HDGsekwżo 3x1,5 RE FE180 PH90/E30-E90		
69			(N)HXH 4x50 RM FE180 PH90/E90	12	Uchwyt kablowy UKO1 + Szczebel SDOC 1000 Mocowanie do betonu co 600 mm za pomocą stalowego łącznika rozporowego PSRn M8x75 firmy Dromet
70			(N)HXH 4x50 RM FE180 PH90/E90		
71			(N)HXCH 4x50/25 RM FE180 PH90/E90		
72			(N)HXCH 4x50/25 RM FE180 PH90/E90		
73			(N)HXH 4x1,5 RE FE180 PH90/E90		
74			(N)HXH 4x1,5 RE FE180 PH90/E90		
75			(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90		
76			(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90		
77			(N)HXH 4x50 RM FE180 PH30/E30		
78			(N)HXH 4x50 RM FE180 PH30/E30		
79			(N)HXCH 4x50/25 RM FE180 PH30/E30		
80			(N)HXCH 4x50/25 RM FE180 PH30/E30		
81			(N)HXH 4x1,5 RE FE180 PH30/E30		
82			(N)HXH 4x1,5 RE FE180 PH30/E30		
83			(N)HXCH 4x1,5/1,5 RE FE180 PH30/E30		
84			(N)HXCH 4x1,5/1,5 RE FE180 PH30/E30		
85			HDGszo 3x1,5 RE FE180 PH90/E30-E90		

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FIRE RESISTANCE

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Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie	
86			HDGszo 3x1,5 RE FE180 PH90/E30-E90			
87			HLGs 2x1,0 FE180 PH90/E30-E90			
88			HLGs 2x1,0 FE180 PH90/E30-E90			
89			HDGsekwżo 3x1,5 RE FE180 PH90/E30-E90			
90			HDGsekwżo 3x1,5 RE FE180 PH90/E30-E90			
91			HLGsekw 2x1,0 FE180 PH90/E30-E90			
92			HLGsekw 2x1,0 FE180 PH90/E30-E90			
93			NHXH -J 4x50 RM FE180 PH90/E90	13	Uchwyt kablowy UKO2 + Szczebel SDOC 1000 Mocowanie do betonu co 600 mm za pomocą stalowego łącznika rozporowego PSRn M8x75 firmy Dromet	
94			NHXH -J 4x50 RM FE180 PH90/E90			
95			NHXH -J 4x50 RM FE180 PH90/E90			
96			NHXH -J 4x1,5 RE FE180 PH90/E90			
97			NHXH -J 4x1,5 RE FE180 PH90/E90			
98			NHXH -J 4x1,5 RE FE180 PH90/E90			
99			(N)HXH 4x50 RM FE180 PH90/E90	14	Uchwyty kablowe UDF Mocowanie do betonu co 600 mm za pomocą stalowego łącznika rozporowego PSR M6x65 firmy Dromet	
100			(N)HXH 4x50 RM FE180 PH90/E90			
101			(N)HXCH 4x50/25 RM FE180 PH90/E90			
102			(N)HXCH 4x50/25 RM FE180 PH90/E90			
103			HDGszo 3x1,5 RE FE180 PH90/E30-E90			
104			HDGszo 3x1,5 RE FE180 PH90/E30-E90			
105			(N)HXH 4x1,5 RE FE180 PH90/E90	15	Uchwyty kablowe UDF Mocowanie do betonu co 600 mm za pomocą stalowego łącznika rozporowego PSR M6x65 firmy Dromet	
106			(N)HXH 4x1,5 RE FE180 PH90/E90			
107			(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90			
108			(N)HXCH 4x1,5/1,5 RE FE180 PH90/E90			
111			PG M10/... + NP M10x30 + TRS M10x40	16	Mocowanie : 2 pręty gwintowane PG M ... połączone nakrętką przedłużaną NP M... mocowane do betonu za pomocą tulei rozporowej TRS M... firmy Dromet	obciążenie 50 kg
112			PG M10/... + NP M10x30 + TRS M10x40			obciążenie 50 kg
113			PG M8/... + NP M8x28 + TRS M8x30			obciążenie 40 kg
114			PG M8/... + NP M8x28 + TRS M8x30			obciążenie 40 kg
115			PG M6/... + NP M6x28 + TRS M6x25			obciążenie 25 kg
116			PG M6/... + NP M6x28 + TRS M6x25			obciążenie 25 kg

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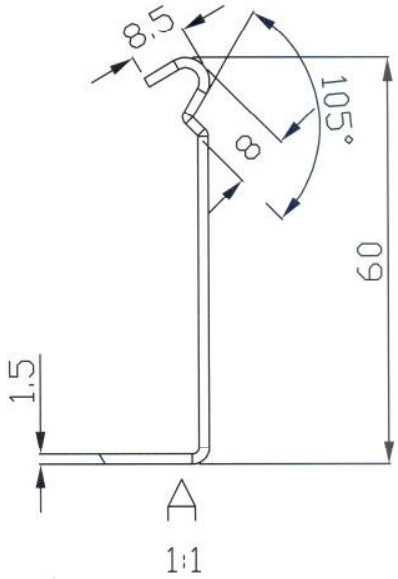
Zestawienie kabli Technokabel:

Lp	Symbol kaba		Średnica kabla	Ciężar kabla	Ilość
1	(N)HXH	FE 180 PH30/E30 4x 1,5 RE	14 mm	0,28 kg/m	6
2	(N)HXH	FE 180 PH30/E30 4x 50 RM	33 mm	2,60 kg/m	6
3	(N)HXCH	FE 180 PH30/E30 4x 1,5/1,5 RE	15 mm	0,32 kg/m	6
4	(N)HXCH	FE 180 PH30/E30 4x 50/25 RM	35 mm	2,95 kg/m	6
5	(N)HXH	FE 180 PH90/E90 4x 1,5 RE	15 mm	0,31 kg/m	8
6	(N)HXH	FE 180 PH90/E90 4x 50 RM	34 mm	2,70 kg/m	8
7	(N)HXCH	FE 180 PH90/E90 4x 1,5/1,5 RE	17 mm	0,35 kg/m	8
8	(N)HXCH	FE 180 PH90/E90 4x 50/25 RM	36 mm	3,00 kg/m	8
9	NHXH-J	FE 180 PH90/E90 4x 1,5 RE	16 mm	0,35 kg/m	5
10	NHXH-J	FE 180 PH90/E90 4x 50 RM	33 mm	2,70 kg/m	5
11	NHXCH	FE 180 PH90/E90 4x 1,5/1,5 RE	17 mm	0,39 kg/m	2
12	NHXCH	FE 180 PH90/E90 4x 50/25 RM	36 mm	2,95 kg/m	2
13	HDGszo	FE180 PH90/E30-E90 3x1,5 RE	8 mm	0,1 kg/m	12
14	HDGsekwżo	FE180 PH90/E30-E90 3x1,5 RE	8 mm	0,1 kg/m	6
15	HLGs	FE180 PH90/E30-E90 2x1,0 mm^2	7 mm	0,1 kg/m	8
16	HLGsekw	FE180 PH90/E30-E90 2x1,0 mm^2	7 mm	0,1 kg/m	10
17	HTKSH	FE180 PH90/E30-E90 1x2x0,8 mm	7 mm	0,1 kg/m	2
18	HTKSHekw	FE180 PH90/E30-E90 1x2x0,8 mm	7 mm	0,1 kg/m	2

Pozycja 1, 2, stal ocynkowana metodą ogniową PN -EN 1461:2000
Pozycja 3 stal ocynkowana metodą Sendzimira - próba
Pozycja 4, 5, 6, 7, 10, 11, 12, 14 i 15 stal ocynkowana metodą Sendzimira PN -EN 10327

A	Typ	Nr.kat
100	KCOP100H60/3N	862010
200	KCOP200H60/3N	862020
300	KCOP300H60/3N	862030
400	KCOP400H60/3N	862040



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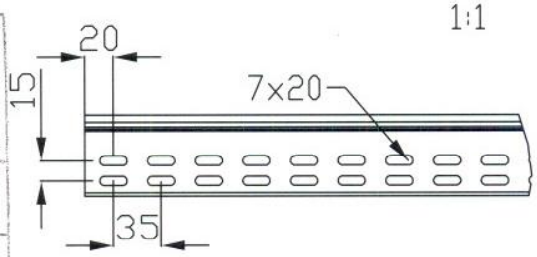
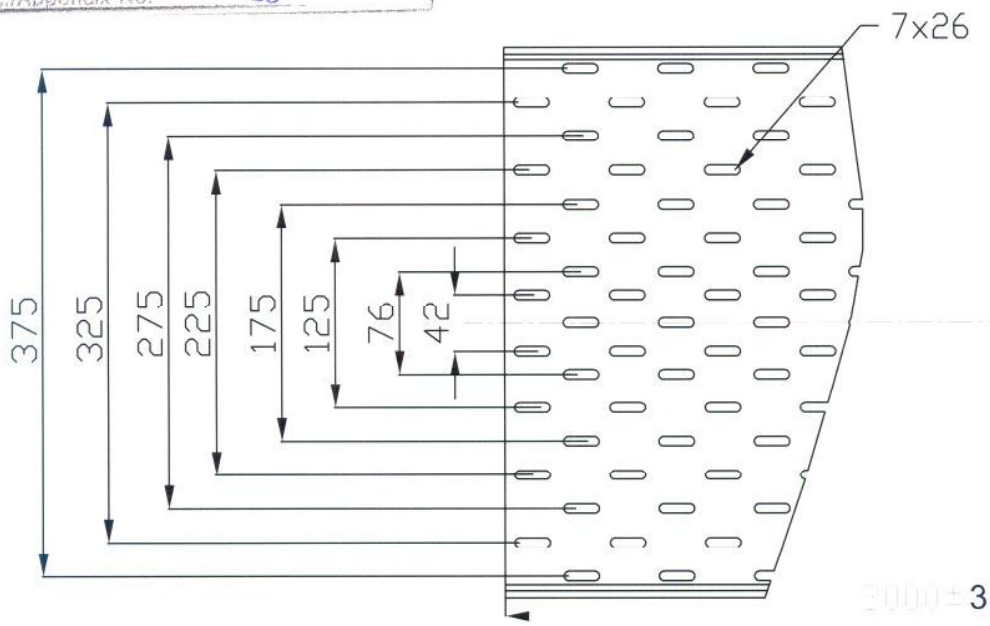
FIRE RESISTANCE

Dátum/Date 02.04.2009
Podpis/Signature

Dokument č. / Document No. FIRES-FR-059-09-ARWE

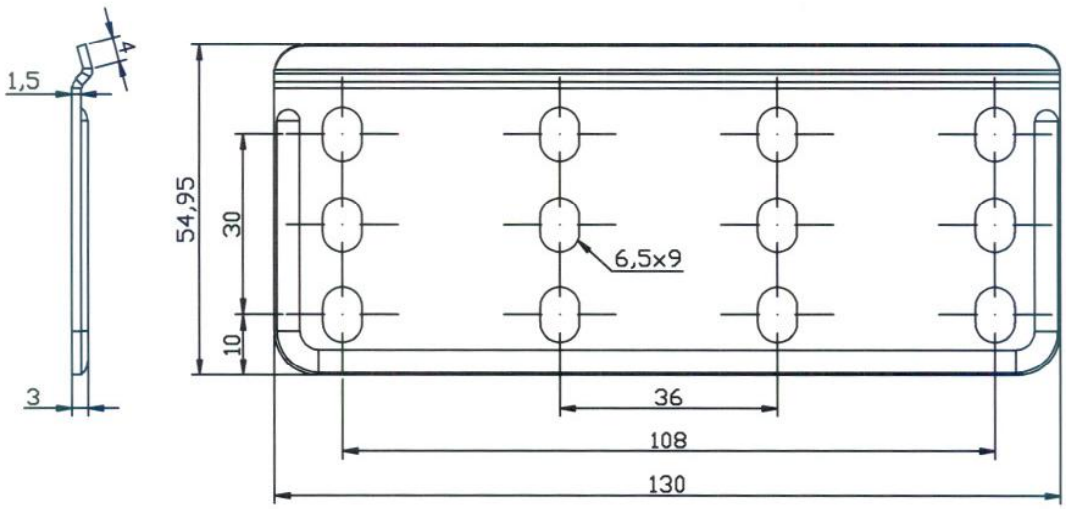
Príloha č./Appendix No. 38





3000±3

	Odchyłka wymiarów) nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	Format A4
				Nr normy	PN-EN 10142 + A1 : 1997			Arkusz
				półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko	J.GROCHOWSKI	Podpis	Data	20.10.05	Nazwa rysunku	KCOP400H60/3N	
Rysował		J.Grochowski			20.10.05			
Sprawdził		T.WLODARCZYK			20.10.05			
Zatwierdził		J.KLICZEK			20.10.05	Nr programu maszynowego		Nr zmiany
	Profesjonalne Systemy Tras Kablowych					Nr rysunku	862040	



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FIRE RESISTANCE

Dátum/Date 02.04.2009

Podpis/Signature

Dokument č. / Document No. FIRES-FR-054-09-ANNE

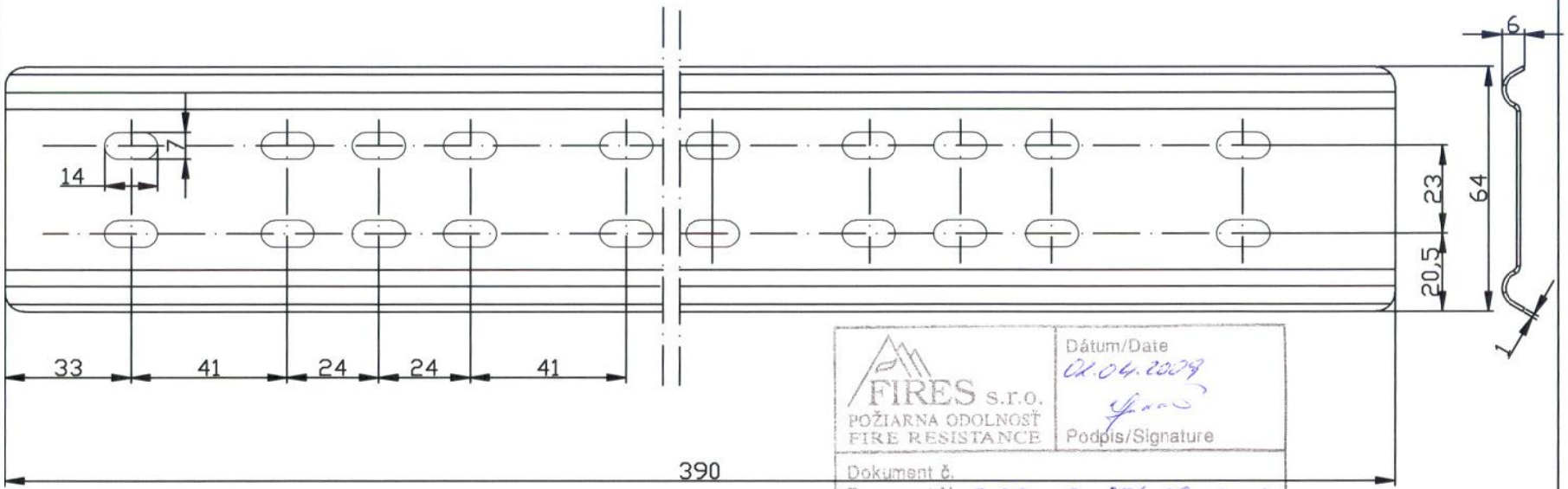
Príloha č./Appendix No. 39

Odchyłka wymiarów nietolerowanych	Materiał: Gatunek	Blacha stal.cynk.met.Sędziszów	Masa [kg]	Podziałka	Format A4
	Nr normy	PN-EN 10327:2005	0,09	1:1	Arkusz
	półfabrykat (nr normy)				Arkuszy

	Nazwisko	Podpis	Data	Nazwa rysunku
Projektował	J.GROCHOWSKI		20.10.05	LPOPH60N
Rysował	J.Grochowski		20.10.05	
Sprawdził	T.WLODARCZYK		20.10.05	
Zatwierdził	J.KLICZEK		20.10.05	Nr zmiany

Profesjonalne Systemy Tras Kablowych

Nr rysunku 860700



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FIRE RESISTANCE

Dátum/Date 02.04.2009
Podpis/Signature

Dokument č.
Document No. FIRES-FR-054-09-PAVUC

Príloha č./Appendix No. 40

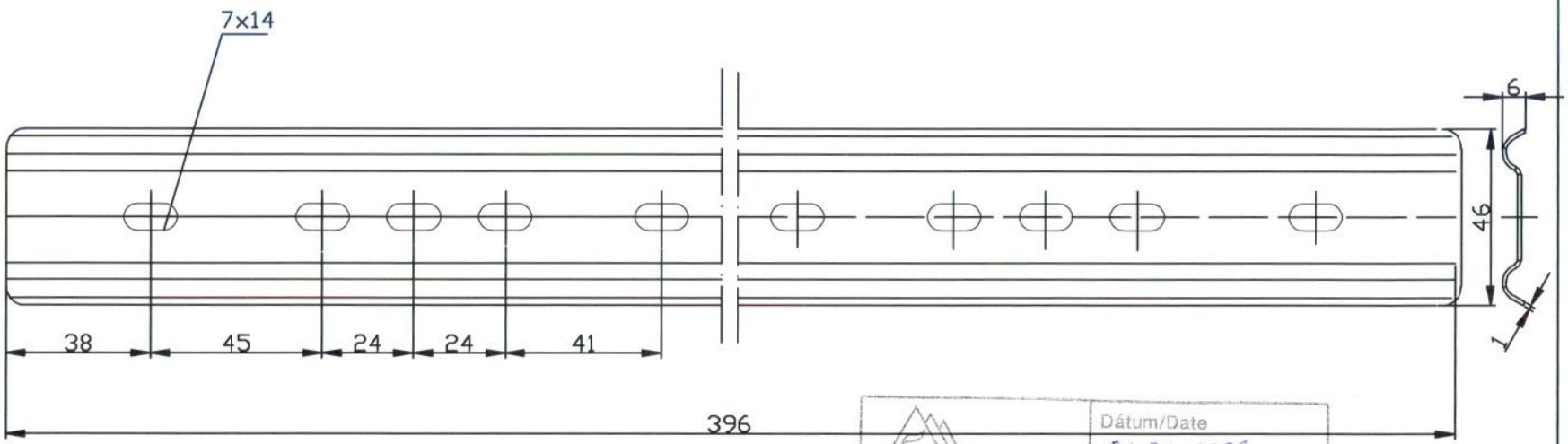
Odchyłka wymiarów nietolerowanych		Materiał	Gatunek	Blacha stal.cynk.met.Sędzimira	Masa [kg]	Podziałka	Format A3
			Nr normy	PN-EN 10327:2005	0,24	1:1	Arkusz
			półfabrykat (nr normy)				Arkuszy

	Nazwisko	Podpis	Data	Nazwa rysunku
Projektował	J.GROCHOWSKI		20.10.05	BL0400N
Rysował	J.Grochowski		20.10.05	
Sprawdził	T.WŁODARCZYK		20.10.05	
Zatwierdził	J.KLICZEK		20.10.05	Blacha łącznikowa

Profesjonalne Systemy
Tras Kablowych

Nr rysunku 862440

Nr zmiany



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FIRE RESISTANCE

Dátum/Date 02.04.2009
Podpis/Signature

Dokument č./Document No. FIRES-FR-054-09-PAVE

Príloha č./Appendix No. 41

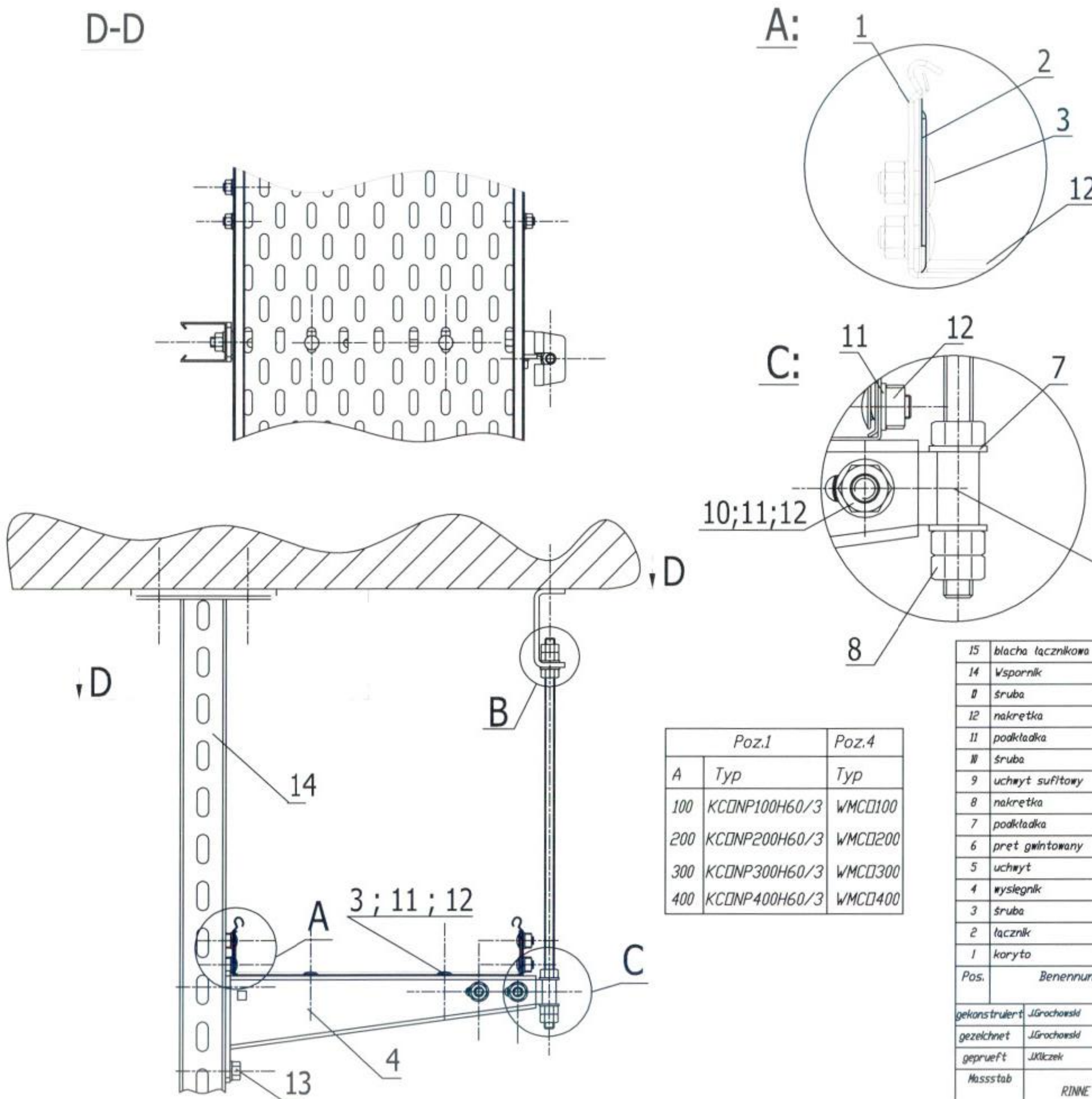
Dachyłka wymiarów nietolerowanych		Materiał	Gatunek	Blacha stal.cynk.met.Sędzimira	Masa [kg]	Podziałka	Format A3
			Nr normy	PN-EN 10327:2005	0,16	1:1	Arkusz
			półfabrykat (nr normy)				Arkuszy

	Nazwisko	Podpis	Data	Nazwa rysunku
Projektował	J.GROCHOWSKI		20.10.05	BZK0400N
Rysował	J.Grochowski		20.10.05	
Sprawdził	T.WŁODARCZYK		20.10.05	
Zatwierdził	J.KLICZEK		20.10.05	Blacha zakończeniowa

Nr zmiany

Profesjonalne Systemy
Tras Kablowych

Nr rysunku 862540



Poz.1		Poz.4
A	Typ	Typ
100	KC□NP100H60/3	WMC□100
200	KC□NP200H60/3	WMC□200
300	KC□NP300H60/3	WMC□300
400	KC□NP400H60/3	WMC□400

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Dátum/Date 02.04.2009

Podpis/Signature

Dokument č./Document No. FIRES-FR-057-09-AUVE

Príloha č./Appendix No. 52

Pos.	Benennung	Zeichnung-Nr	Material	Stck.	Katalogs Nr.
15	blacha łącznikowa	BL□N400		1	862440
14	Wspornik	WPC□		1	800830
13	śruba	SM M10x30		2	650843
12	nakretka	NS M8		16	650144
11	podkładka	PP 8		16	650444
10	śruba	SGM8x16		2	650443
9	uchwyt sufitowy	US□V		1	803700
8	nakretka	NS M10		8	650244
7	podkładka	PP 10		8	650544
6	pret gwintowany	PGM10_1		1	651001
5	uchwyt	UPW□		1	803300
4	wysięgnik	WMC□400	PN-EN ISO 1461:2000	1	800340
3	śruba	SGN M6x12		14	650641
2	łącznik	LP□NPH60		2	860700
1	koryto	KC□NP400H60/3	PN-EN 10142+A1:1997	1	862040

gekonstruiert	J.Grochowski	02.11.06
gezeichnet	J.Grochowski	02.11.06
geprueft	J.Kliczek	02.11.06

Massstab 1:5

RINNE KC□NP300H60/2 + AUSLEGER

fire

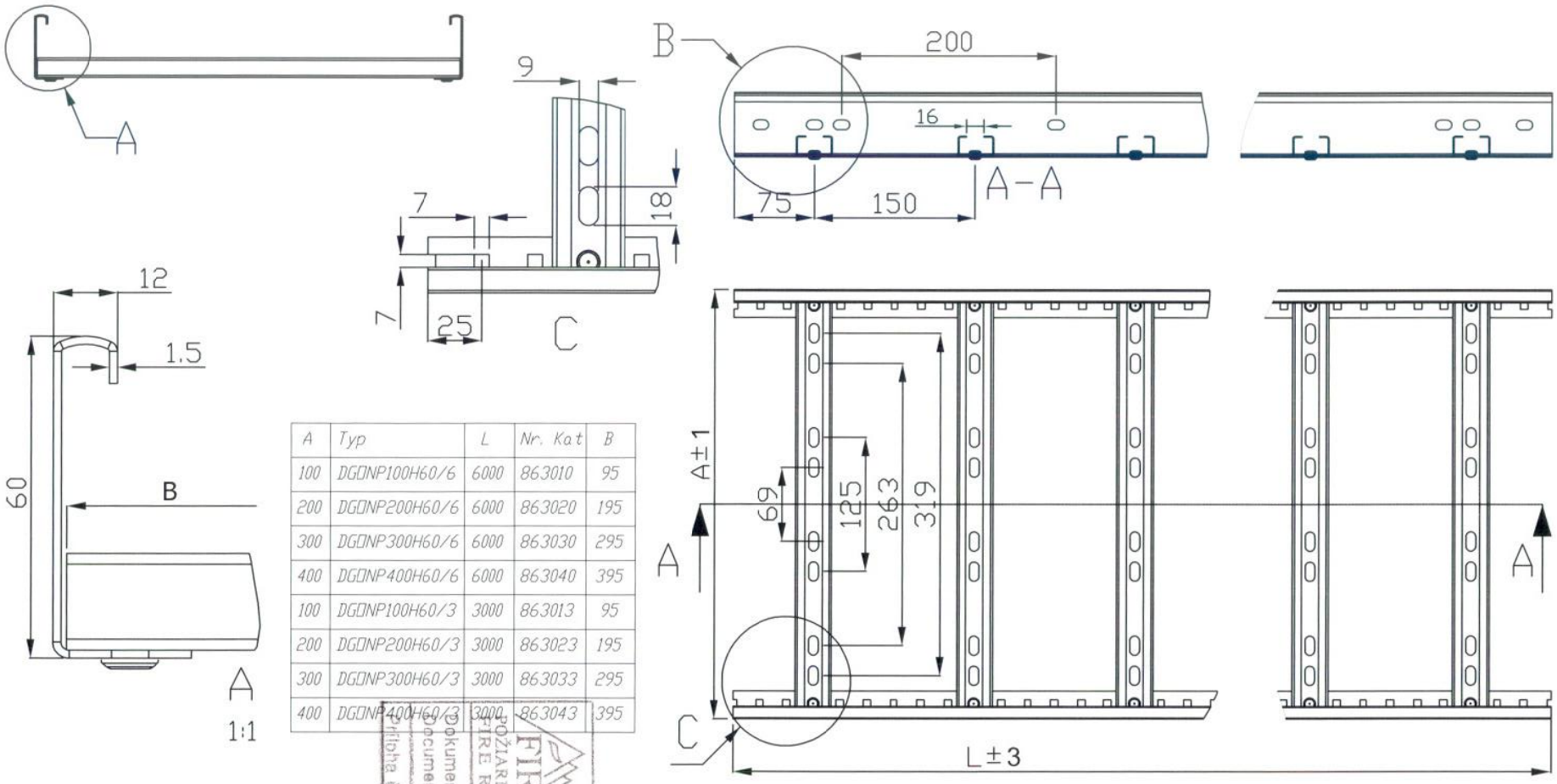
BAKS
DZIAŁ KONSTRUKCYJNY
ul. Jagodne 5 05-480
Karczew

Blatt 1 von 1

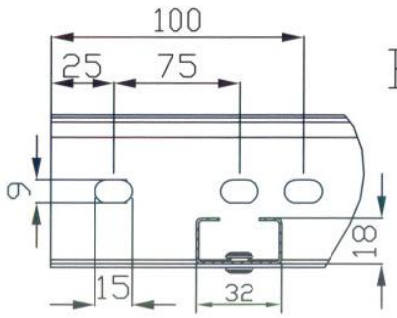
Grosse A3

Name: Feuerbestandig System

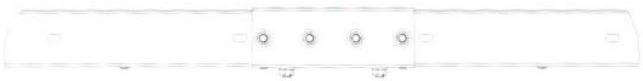
Vorhaben/Forschen

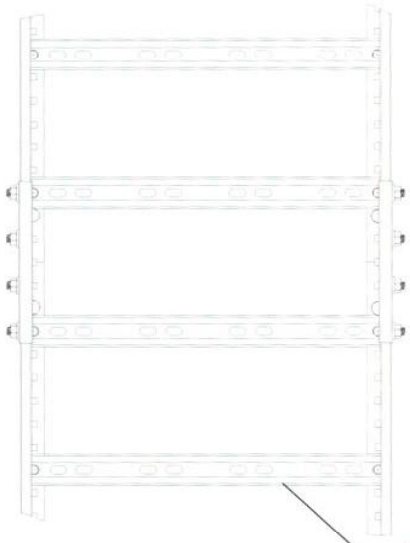


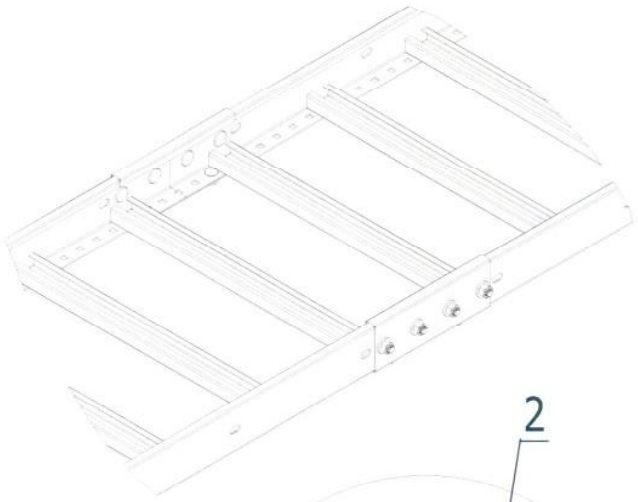
A	Typ	L	Nr. Kat	B
100	DGONP100H60/6	6000	863010	95
200	DGONP200H60/6	6000	863020	195
300	DGONP300H60/6	6000	863030	295
400	DGONP400H60/6	6000	863040	395
100	DGONP100H60/3	3000	863013	95
200	DGONP200H60/3	3000	863023	195
300	DGONP300H60/3	3000	863033	295
400	DGONP400H60/3	3000	863043	395

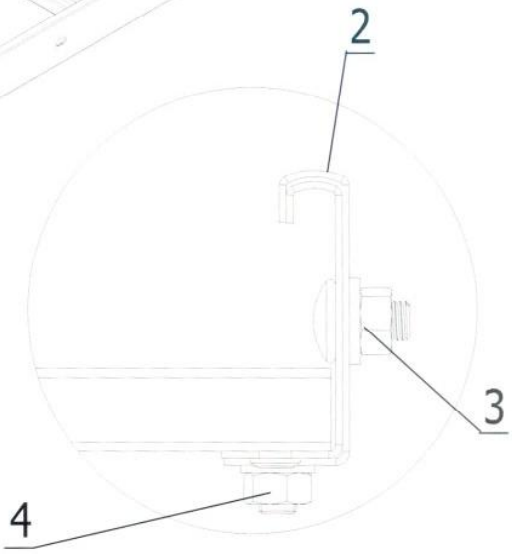


Odchyłka wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	Format A4
			Nr normy				Arkusz
			półfabrykat (nr normy)				Arkuszy
Projektował	J.GRODCHOWSKI	Podpis	Data	20.10.05	Nazwa rysunku		
Rysował	J.Grochowski			20.10.05	DGONP400H60/3		
Sprawdził	T.WŁODARCZYK			20.10.05			
Zatwierdził	J.KLICZEK			20.10.05	Nr programu		Nr zmiany
BAKS Resjonalne Systemy Tras Kablowych					Nazwa programu ---		









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FIRE RESISTANCE

Dátum/Date 01.04.2009

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Dokument č. / Document No. FIRES-FR-054-09-ADVE

Príloha č./Appendix No. 99

Pos.	Benennung	Zeichnung-Nr	Material	Stck.	Katalogs Nr.
4	śruba	SGN M6x12		4	650442
3	śruba	SGN M8x14		8	650142
2	łącznik	LDDNCH60		2	863000
1	DRABINKA	DGDNP400H60		1	863043

Drabiny kablowe metalowe

Materiał

Gatunek

Nr normy PN-EN 10327:2005

Masa (kg)

Podziałka 1:50

Format A4

Arkusz 1

Arkuszy 1

Projektował

Rysował

Sprawdził

Zatwierdził

Wykonał Jaroszewski

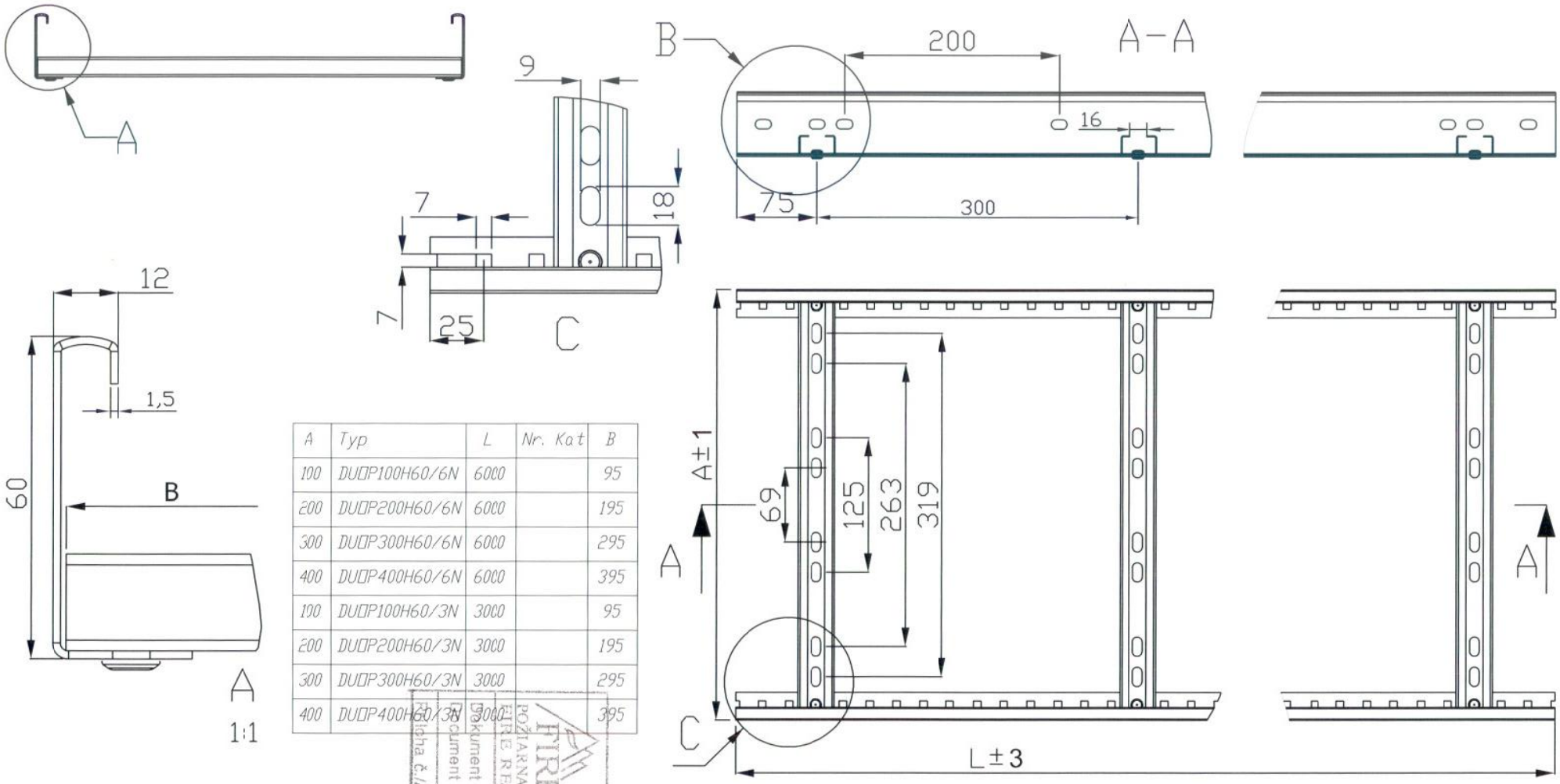
Data 21 Nov 08

Nr rysunku

Nr poprzedniego rysunku

Nr zmiany

Profesjonalne Systemy Tras Kablowych



A	Typ	L	Nr. Kat	B
100	DU□P100H60/6N	6000		95
200	DU□P200H60/6N	6000		195
300	DU□P300H60/6N	6000		295
400	DU□P400H60/6N	6000		395
100	DU□P100H60/3N	3000		95
200	DU□P200H60/3N	3000		195
300	DU□P300H60/3N	3000		295
400	DU□P400H60/3N	3000		395

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Dátum/Date 08.04.2009

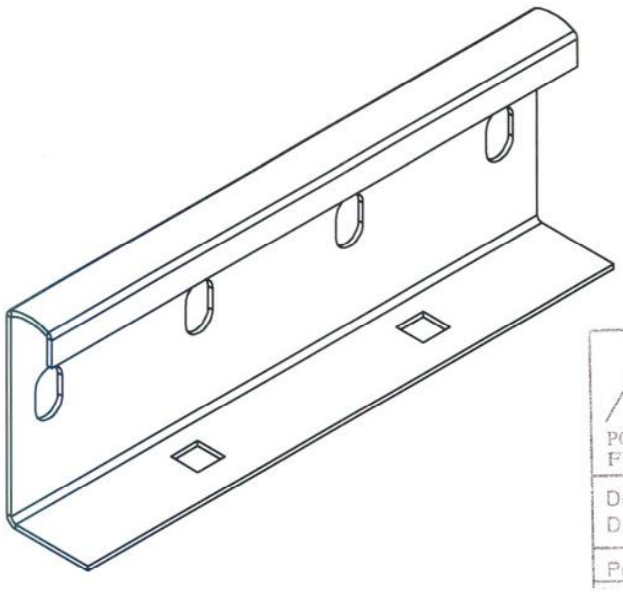
Podpis/Signature

Dokument č./Document No. FIRES-FR-054-03-ANE

Příloha č./Appendix No. 45

Odchyłka wymiarów nietolerowanych			Materiał	Gatunek		Masa [kg]	Podziałka	Format A4
				Nr normy				Arkusz
				półfabrykat (nr normy)				Arkuszy
Projektował	J.GRODHOWSKI			20.10.05	Nazwa rysunku			
Rysował	J.Grochowski			20.10.05	DU□P400H60/3N			
Sprawdził	T.WŁODARCZYK			20.10.05				
Zatwierdził	J.KLICZEK			20.10.05	Nr programu			Nr zmiany
Nazwisko		Podpis	Data		Nr szyny/wg			

BAKS Profesjonalne Systemy Tras Kablowych



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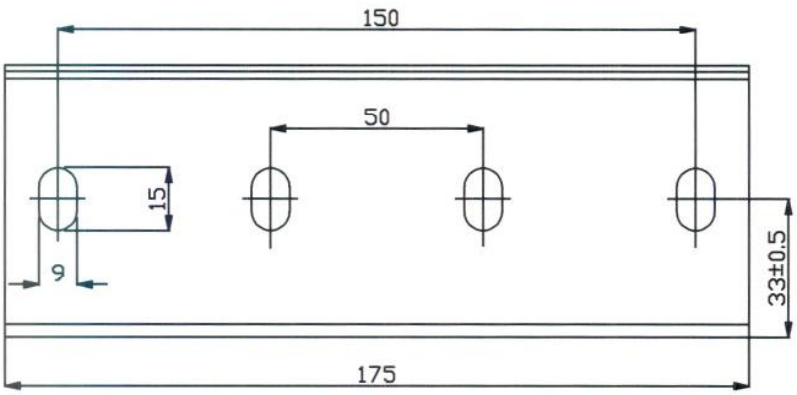
FIRE RESISTANCE

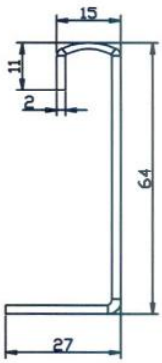
Dátum/Date 02.09.2009

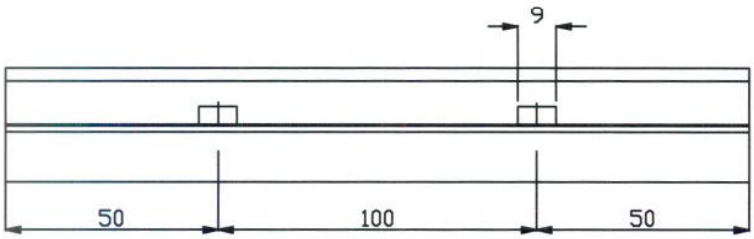
Podpis/Signature

Dokument č. / Document No. FIRES-FR-05.9-09-ANNEX

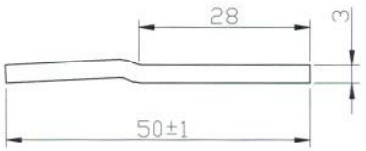
Príloha č./Appendix No. 56

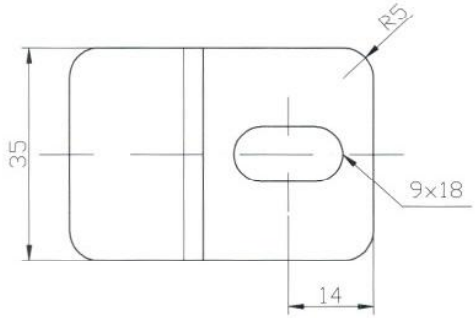






	Dachyłka wymiarów nietolerowanych		Materiał	Gatunek	Blach.stal.cynk.net.Sendzimira	Masa [kg]	Podziałka	Format A4
				Nr normy	PN-EN 10327:2005			Arkusz
				półfabrykat (nr normy)				Arkuszy
Projektował	J.GROCHOWSKI			20.10.05	Nazwa rysunku	LDCH60N		
Rysował	J.Grochowski			20.10.05				
Sprawdził	T.WŁODARCZYK			20.10.05				
Zatwierdził	J.KLICZEK			20.10.05				Nr zmiany
Nazwisko		Podpis	Data					
Profesjonalne Systemy Tras Kablowych					Nr rysunku 863000			





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POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

Dátum/Date 01.04.2009

Podpis/Signature

Dokument č./Document No. FIRES-FR-054.09-ANNEX

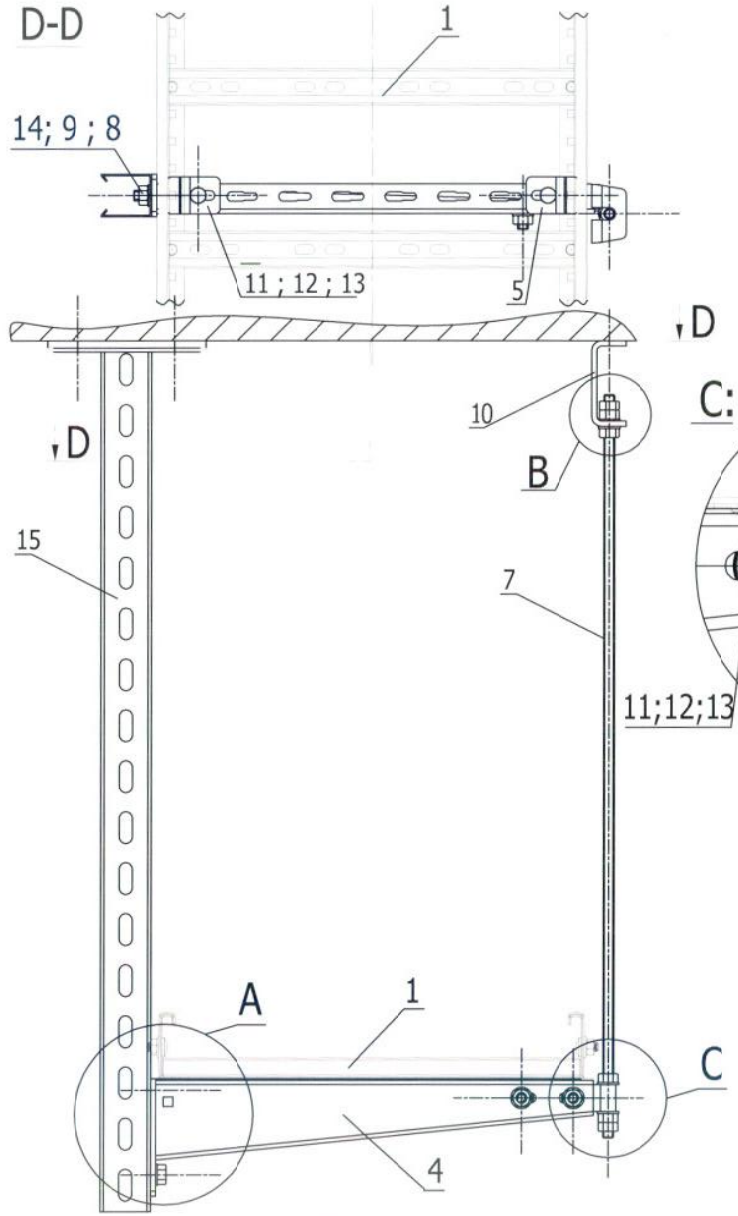
Príloha č./Appendix No. 42

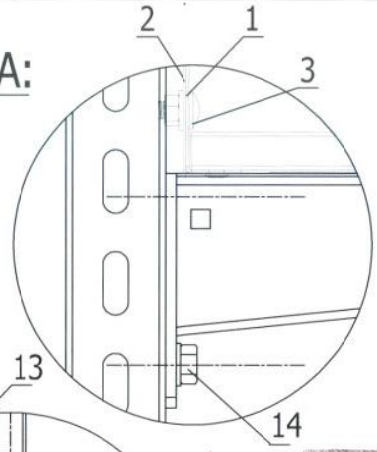
	Dachytka wyrlarów nietolerowanych	±0,5	Materiał	Gatunek	-----	Masa [kg]	Podziałka	Format A4
				Nr normy	PN-EN 10327:2005	0,04	1:1	Arkusz --
				półfabrykat (nr normy)	-----			Arkuszy --

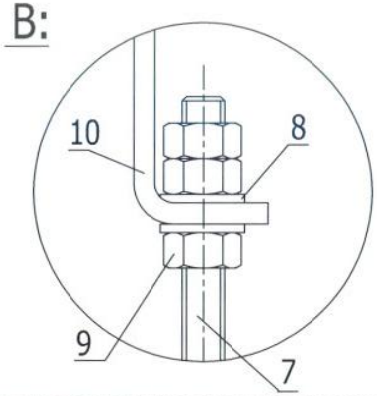
	Nazwisko	Podpis	Data	
Projektował	Tomasz Grudniewski		29.12.04	Nazwa rysunku ZMO
Rysował	Jakub Rudak		20.02.08	
Sprawdził	Jacek Kliczek		20.02.08	
Zatwierdził	Jacek Kliczek		20.02.08	Nr zmiany

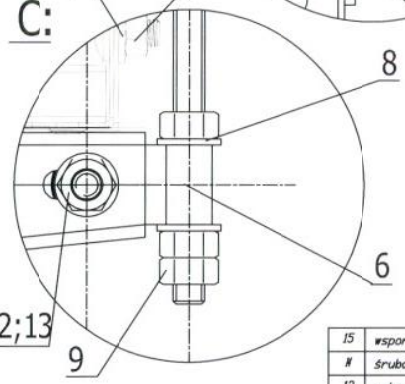
Profesjonalne Systemy Tras Kablowych

Nr rysunku 802900









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POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

Dátum/Date 04.09.2009

Podpis/Signature

Dokument č./Document No. FIRES-FR-054-CA-AJWE

Príloha č./Appendix No. 48

Pos.	Benennung	Zeichnung-Nr	Material	Stck.	Katalogs Nr.
15	wspornik	WPCD		1	800840
14	śruba	SM M10x30		2	650843
13	nakrętka	NS M8		8	650144
12	podkładka	PP 8		8	650444
11	śruba	SGM8x16		4	650443
10	uchwyt sufitowy	USDV		1	803700
9	nakrętka	NS M10		8	650244
8	podkładka	PP 10		8	650544
7	Pręt gwintowany	PGM10_1		1	651001
6	uchwyt	UPWD		1	803300
5	zacisk mocujący	ZMD		2	802900
4	wysięgnik	WMCD400	PN-EN ISO 1461:2000	1	800340
3	śruba	SG M8x14		4	650142
2	łącznik	LDDINCH60	PN-EN 10142:1997	2	863000
1	drabinka	DGDINP400H60		1	863043

gekonstruiert	J.Grochowski	02.11.06	
gezeichnet	J.Grochowski	02.11.06	
geprueft	J.Kliczek	02.11.06	

Massstab 1:5

LEITER DKP400H60/2 + AUSLEGER WMC

fire

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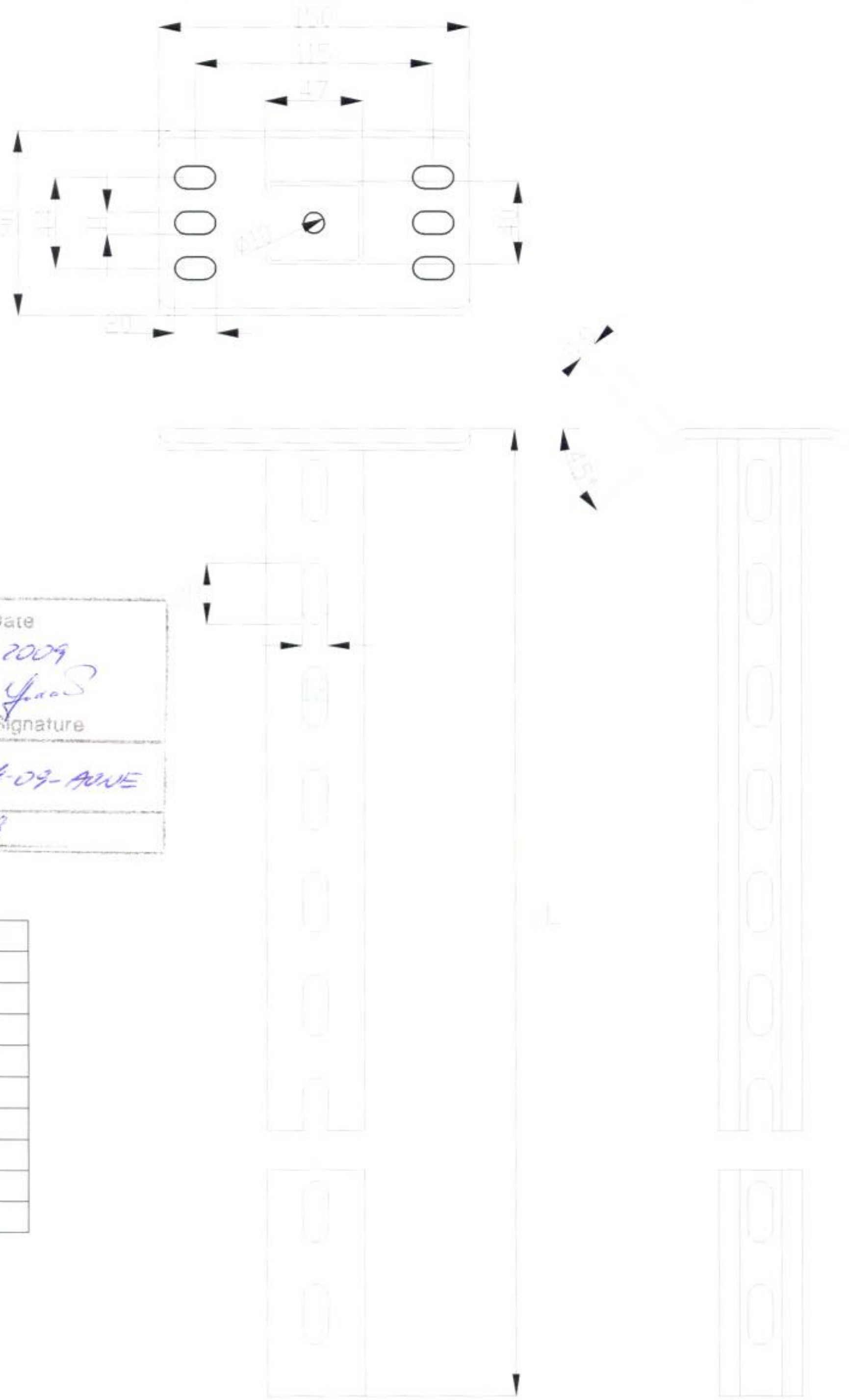
Karczew

Blatt 1 von 1

Grasse A3

Name
Feuerbestandig System

Vorhabern forschen



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Podpis/Signature

Dokument č.
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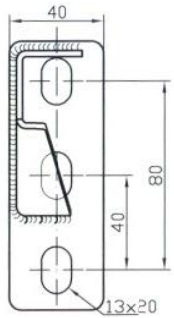
Príloha č./Appendix No. 49

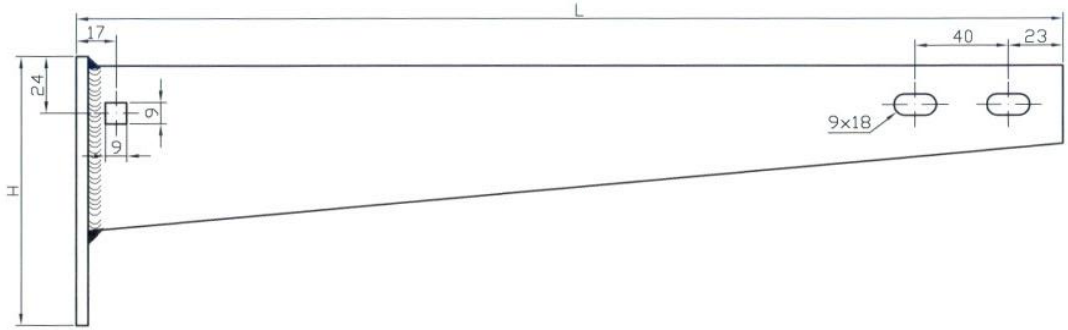
L	Typ	Nr.kat
200	WPCD200	800820
300	WPCD300	800830
400	WPCD400	800840
500	WPCD500	800850
600	WPCD600	800860
700	WPCD700	800870
800	WPCD800	[illegible]
900	WPCD900	[illegible]
1000	WPCD1000	[illegible]

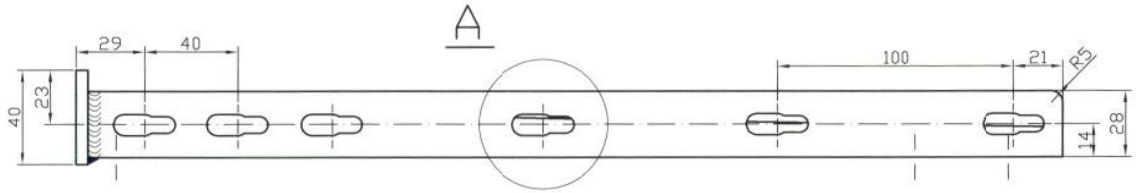
Masa (kg): ---
Podziałka: 1:3
Format: A4
Arkusz: 1
Arkuszy: 1

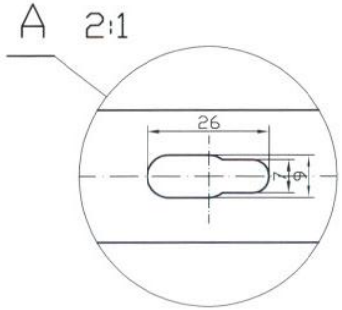
Nazwa rysunku: WPCO

Profesjonalne Systemy Tras Kablowych









4	Wysięgnik	WMCO 400	800340	114,0	420	0,83
3	Wysięgnik	WMCO 300	800330	114,0	320	0,43
2	Wysięgnik	WMCO 200	800320	85,0	220	0,36
1	Wysięgnik	WMCO 100	800310	85,0	120	0,22
LP	Nazwa wyrobu	Symbol	Nr Katalogowy	L [mm]	H [mm]	Masa [kg]

Dachyfka wymiarów nietolerowanych ±0,5

Materiał: Gatunek ----- | Nr normy PN-EN 10327:2005 | półfabrykat (nr normy) -----

Masa [kg] ----

Podziałka 1:1

Format A3 | Arkusz -- | Arkuszy --

	Nazwisko	Podpis	Data
Projektował	Tomasz Grudniewski		29.12.04
Rysował	Jakub Rudak		20.02.08
Sprawdził	Jacek Kliczek		20.02.08
Zatwierdził	Jacek Kliczek		20.02.08

Nazwa rysunku: WMCO...

Nr zmiany

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Nr rysunku: 802900

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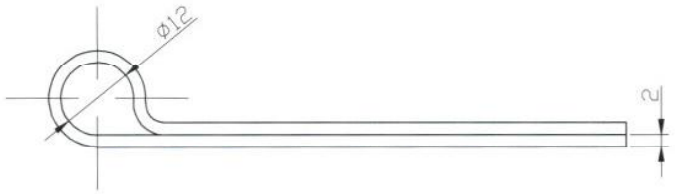
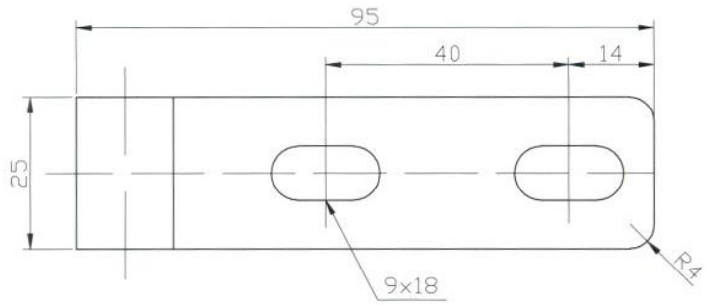
Dokument č. Document No. FIRES-FR-054-09-PAVLÉ

Príloha č./Appendix No. 50





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Dokument č.
Document No. FIRES-FR-054-09-ANX

Príloha č./Appendix No. 51

	Dachytka wymiarów nietolerowanych	±0,5	Materiał	Gatunek	-----	Masa [kg]	Podziałka	Format A4
				Nr normy	PN-EN 10327:2005	---	1:1	Arkusz --
				półfabrykat (nr normy)	-----			Arkuszy --

	Nazwisko	Podpis	Data	Nazwa rysunku
Projektował	Jacek Grochowski		12.02.04	UPWO
Rysował	Jakub Rudak		20.02.08	
Sprawdził	Jacek Kliczek		20.02.08	
Zatwierdził	Jacek Kliczek		20.02.08	Nr zmiany

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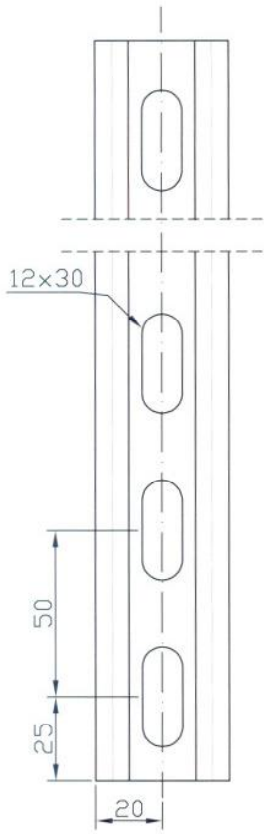
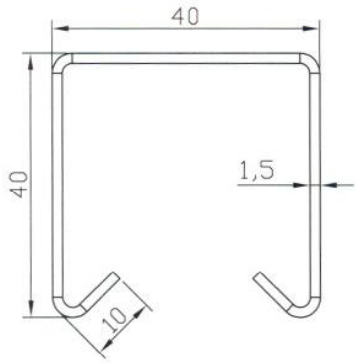
Nr rysunku 803300





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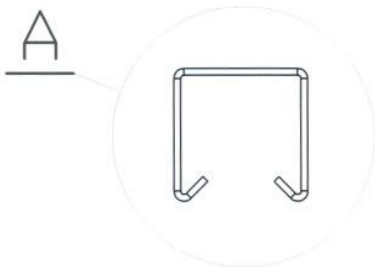
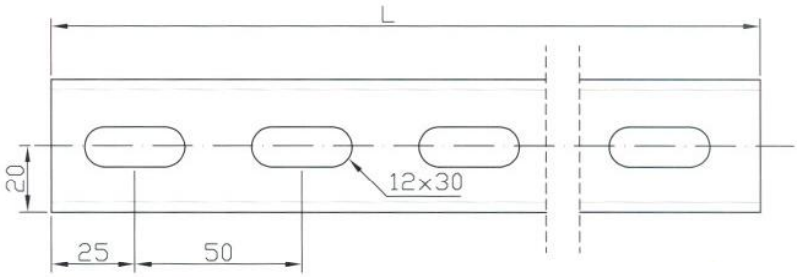
Podpis/Signature

Dokument č./Document No. FIRES-FR-054-09-RUNE

Príloha č./Appendix No. 52





LP	Nazwa wyrobu	Symbol	Nr Katalogowy	L [mm]	Masa [kg]
5	Ceownik wzmocniony	CWOP40H40/ 2	804120	2000	3,50
4	Ceownik wzmocniony	CWOP40H40/05	804105	500	0,88
3	Ceownik wzmocniony	CWOP40H40/04	804104	400	0,70
2	Ceownik wzmocniony	CWOP40H40/03	804103	300	0,53
1	Ceownik wzmocniony	CWOP40H40/02	804102	200	0,35

Odchyłka wymiarów nietolerowanych

Materiał: Gatunek; Nr normy: PN-EN 10327:2005; półfabrykat (nr normy): -----

Masa [kg]: ---

Podziałka: 1:2

Format A4; Arkusz --; Arkuszy --

	Nazwisko	Podpis	Data
Projektował	Jacek Grochowski		20.10.05
Rysował	Jakub Rudak		20.02.08
Sprawdził	Jacek Kliczek		20.02.08
Zatwierdził	Jacek Kliczek		20.02.08

Nazwa rysunku: CWOP40H40/...N

Nr zmiany

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Nr rysunku: 8041.....

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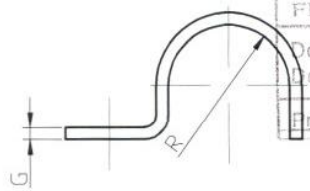
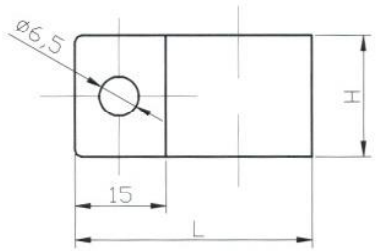
Príloha č./Appendix No. 53





LP	Nazwa wyrobu	Symbol	Nr Katalogowy	R [mm]	L [mm]	H [mm]	G [mm]
20	Uchwyt kabla	UDF 43	405543	21,5	60,0	20,0	2,0
19	Uchwyt kabla	UDF 40	405540	20,0	57,0	20,0	2,0
18	Uchwyt kabla	UDF 37	405537	18,5	54,0	20,0	2,0
17	Uchwyt kabla	UDF 34	405534	17,0	51,0	20,0	2,0
16	Uchwyt kabla	UDF 31	405531	15,5	48,0	20,0	2,0
15	Uchwyt kabla	UDF 28	405528	14,0	45,0	20,0	2,0
14	Uchwyt kabla	UDF 25	405525	12,5	44,0	20,0	2,0
13	Uchwyt kabla	UDF 22	405522	11,0	41,0	14,0	2,0
12	Uchwyt kabla	UDF 20	405520	10,0	39,0	14,0	2,0
11	Uchwyt kabla	UDF 18	405518	9,0	37,0	14,0	2,0
10	Uchwyt kabla	UDF 16	405516	8,0	35,0	14,0	2,0
9	Uchwyt kabla	UDF 15	405515	7,5	34,0	14,0	2,0
8	Uchwyt kabla	UDF 14	405514	7,0	33,0	14,0	1,2
7	Uchwyt kabla	UDF 12	405512	6,0	30,0	14,0	1,2
6	Uchwyt kabla	UDF 10	405510	5,0	28,0	14,0	1,2
5	Uchwyt kabla	UDF 9	405509	4,5	27,0	14,0	1,2
4	Uchwyt kabla	UDF 8	405508	4,0	26,0	14,0	1,2
3	Uchwyt kabla	UDF 7	405507	3,5	25,0	14,0	1,2
2	Uchwyt kabla	UDF 6	405506	3,0	24,0	14,0	1,2
1	Uchwyt kabla	UDF 5	405505	2,5	23,0	14,0	1,2

Odchyłka wymiarów nietolerowanych: ±0,5

Materiał: Gatunek; Nr normy: PN-EN 10327:2005; półfabrykat (nr normy): -----

Masa [kg]: ---

Podziałka: 1:1

Format A4; Arkusz --; Arkuszy --

	Nazwisko	Podpis	Data
Projektował	Jacek Grochowski		20.10.05
Rysował	Jakub Rudak		20.02.08
Sprawdził	Jacek Kliczek		20.02.08
Zatwierdził	Jacek Kliczek		20.02.08

Nazwa rysunku: UDF 5-43

Nr zmiany

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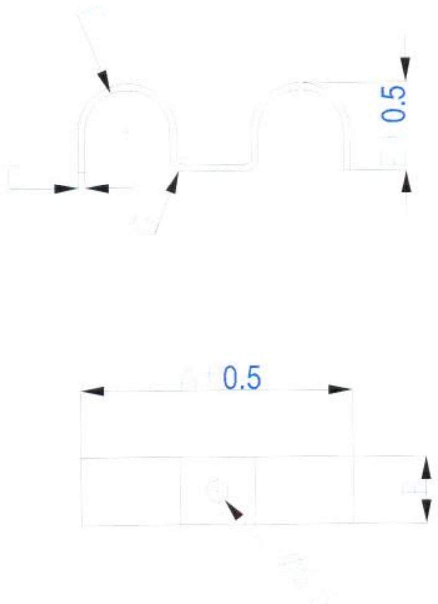
Nr rysunku: 4055.....



	A	B	C	E	F	G
UEF5	38	14	1.2	5	R2.5	R2.4
UEF6	40	14	1.2	6	R3	R2.4
UEF7	42	14	1.2	7	R3.5	R2.4
UEF8	44	14	1.2	8	R4	R2.4
UEF9	46	14	1.2	9	R4.5	R2.4
UEF10	48	14	1.2	10	R5	R2.4
UEF12	52	14	1.2	12	R6	R2.4
UEF14	56	20	2	15	R7	R4
UEF15	60	20	2	16	R7.5	R4
UEF16	62	20	2	17	R8	R4
UEF18	66	20	2	19	R9	R4
UEF20	70	20	2	21	R10	R4
UEF22	74	20	2	23	R11	R4
UEF25	80	20	2	26	R12.5	R4

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Príloha č./Appendix No. 54

Odchyłka wymiarów nietolerowanych

Materiał: Gatunek
Nr normy: PN-EN 10142 + A1 : 1997
półfabrykat, rodzaj, wymiary

Masa [kg]
Podziałka 1:1
Format A4
Arkusz 1
Arkuszy 1

	Nazwisko	Podpis	Data
Projektował	J.GROCHOWSKI		20.10.04
Rysował	J.GROCHOWSKI		21.10.04
Sprawdził	T.WLODARCZYK		25.10.04
Zatwierdził	J.KLISZEK		26.10.04

Nazwa rysunku: UEF

Nr programu maszynowego: ---

Nr zmiany

Nr rysunku: ---

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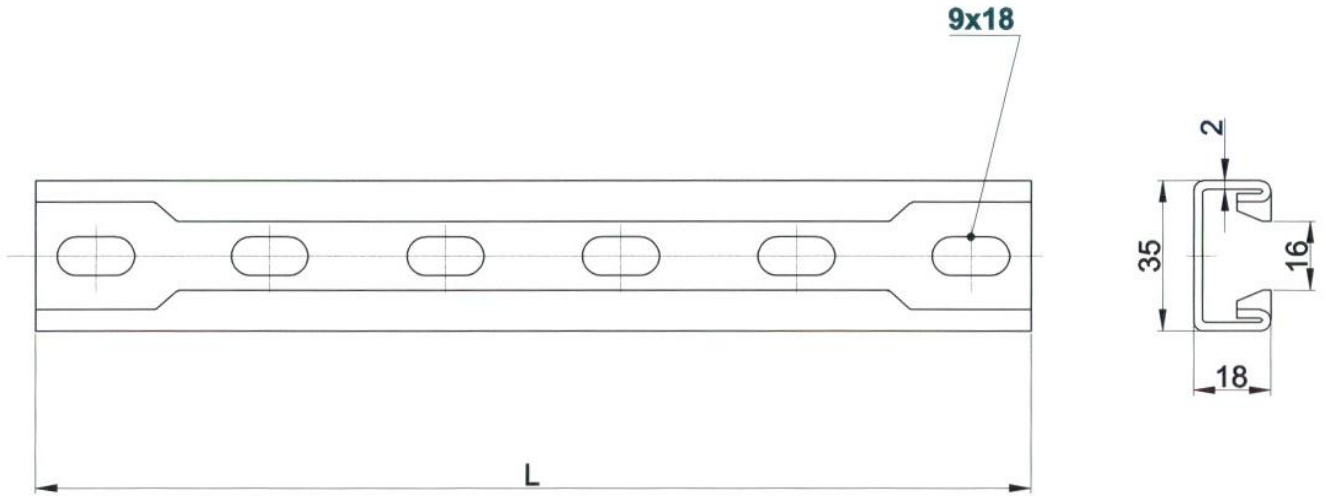

Pos.	Nazwa	Symbol	Długość L (mm)	Materiał	Katalogs Nr.
8	Szczebel	SDDC 1000	990	Bl.stal.cynk.met.Sędzimira PN-EN 10327:2005	800190
7	Szczebel	SDDC 800	790	Bl.stal.cynk.met.Sędzimira PN-EN 10327:2005	800180
6	Szczebel	SDDC 600	590	Bl.stal.cynk.met.Sędzimira PN-EN 10327:2005	800160
5	Szczebel	SDDC 500	490	Bl.stal.cynk.met.Sędzimira PN-EN 10327:2005	800150
4	Szczebel	SDDC 400	390	Bl.stal.cynk.met.Sędzimira PN-EN 10327:2005	800140
3	Szczebel	SDDC 300	290	Bl.stal.cynk.met.Sędzimira PN-EN 10327:2005	800130
2	Szczebel	SDDC 200	190	Bl.stal.cynk.met.Sędzimira PN-EN 10327:2005	800120
1	Szczebel	SDDC 100	90	Bl.stal.cynk.met.Sędzimira PN-EN 10327:2005	800110

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Document No. FIRES-FR-054-09-ANNE

Príloha č./Appendix No. 55

gekonstruiert		
gezeichnet	M.Siewiorski	06.10.2008
gepruefft		
Massstab	1:1	Szczebel SDDC...

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Karczew

Blatt 1 von 1

Grosse A3

Name

Vorhaben: forschen

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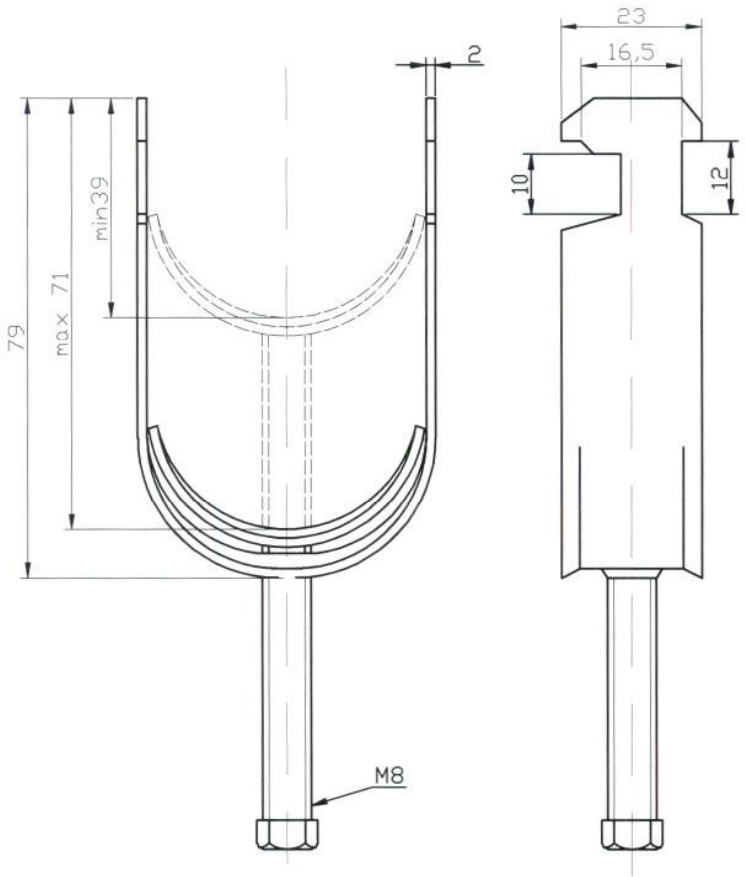
Podpis/Signature

Dokument č./Document No. FIRES-FR-054-09-ANJE

Príloha č./Appendix No. 56



Dachyłka wyniarów) nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	format	A4
			Nr normy				Arkusz	1
			półfabrykat (nr normy)		-----	1:1	Arkuszy	1

	Nazwisko	Podpis	Data	Nazwa rysunku
Projektował	T.Grudniewski		2004.12.29	
Rysował	J.Jasiński		2004.12.29	UKD1/38-40E
Sprawdził	J.Kliczek		2004.12.29	
Zatwierdził	J.Kliczek		2004.12.29	Nr programu maszynowego ---

Nr zmiany

Nr rysunku

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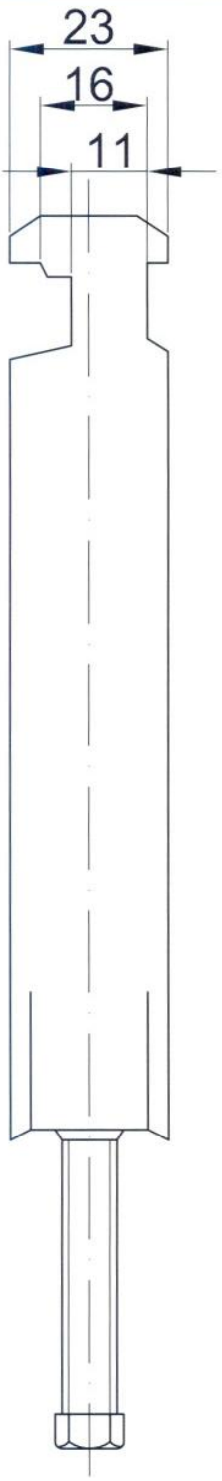

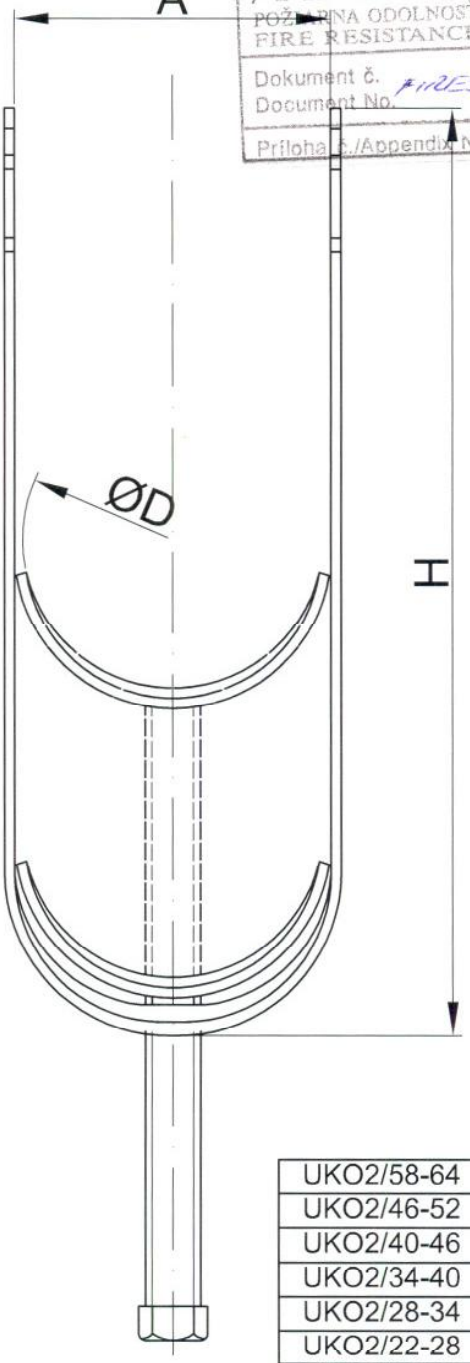

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Príloha č./Appendix No. 5

UKO2/58-64	66	163	64
UKO2/46-52	54	149	52
UKO2/40-46	48	132	46
UKO2/34-40	42	118	40
UKO2/28-34	36	105	34
UKO2/22-28	30	90	28
UKO2/16-22	24	80	22
SYMBOL	A	H	ØD

Odchyłka wymiarów) nietolerowanych		Materiał: Gatunek		Masa [kg]: -----	Podziałka: 1:1
		Nr normy			Format: A4
		półfabrykat (nr normy)			Arkusz: 1
					Arkuszy: 1

Projektował	Nazwisko: G.Matuszewski	Podpis	Data: 2009.06.08	Nazwa rysunku: UKO2/...-...
Rysował				
Sprawdził				
Zatwierdził				Nr programu maszynowego: ---

Nr zmiany

Nr rysunku

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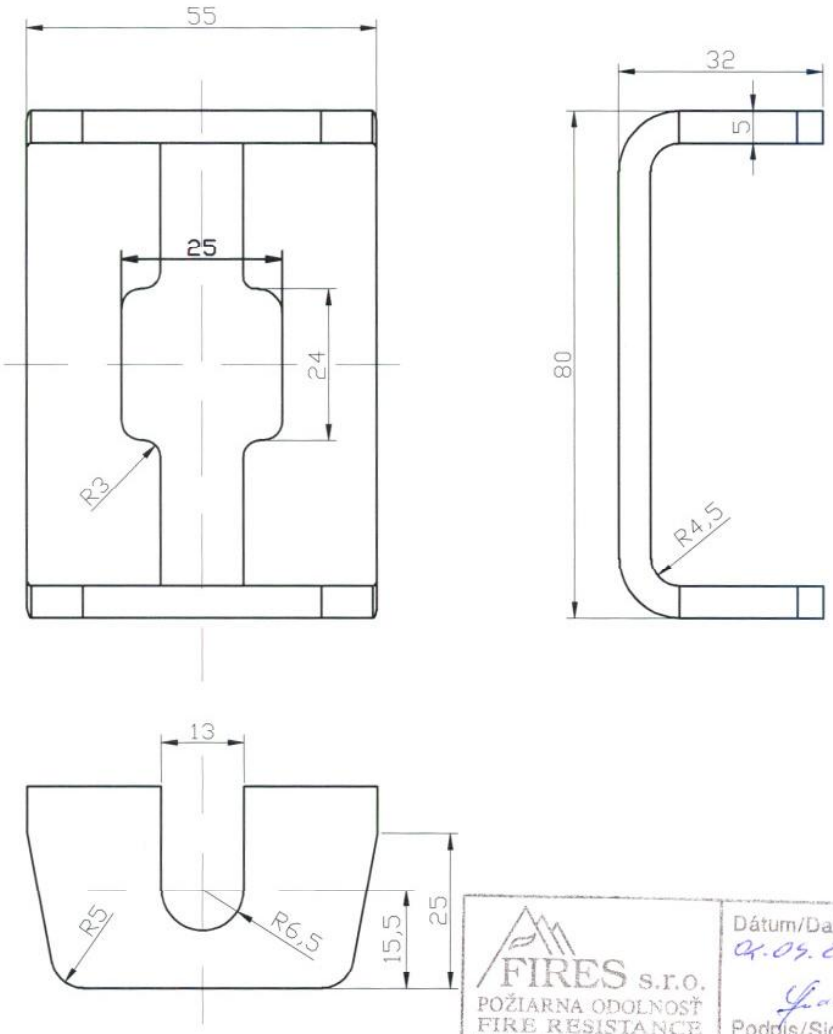
Tras Kablowych



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Dátum/Date 04.09.2009
Podpis/Signature

Dokument č. / Document No. FIRES-FR-054-09-ANNE

Prílohe č./Appendix No. 58

	Odchylka wymiarów nietolerowanych	Grubosc [mm] 5	Materiał	Gatunek	Blacha stal. cynk. met. zanurz.	Masa [kg] 0,21	Podziałka 1:1	Format A4
				Nr normy	PN-EN ISO 1461:2000			Arkusz
				półfabrykat (nr normy)				Arkuszy

	Nazwisko	Podpis	Data	Nazwa rysunku
Projektował	J.GROCHOWSKI		20.10.05	USOV
Rysował	J.Grochowski		20.10.05	
Sprawdził	T.WLODARCZYK		20.10.05	
Zatwierdził	J.KLICZEK		20.10.05	Nr zmiany

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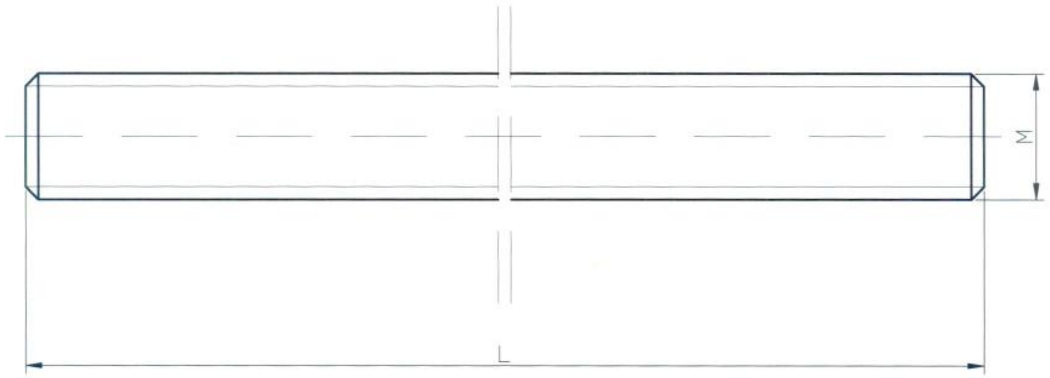
Tras Kablowych

Nr rysunku 803700



Symbol	Gwint M (mm)	Długość L (mm)	Masa (kg)	Nr katalogowy
PGM12/1	12	1000	0,72	651201
PGM10/1	10	1000	0,49	651001
PGM6/1	6	1000	0,16	650301

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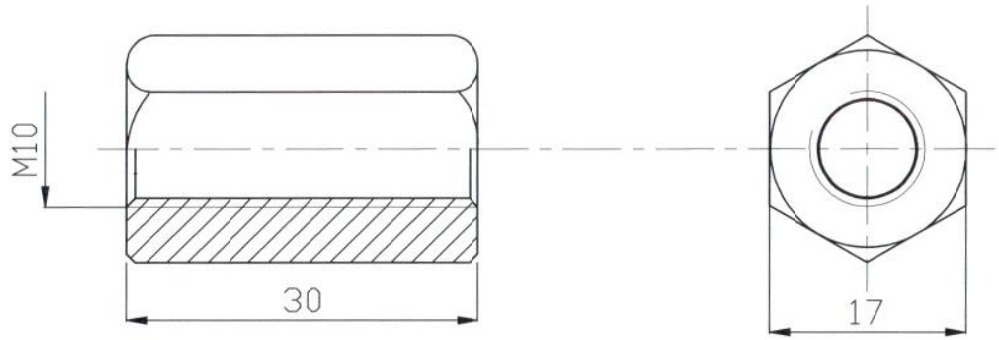
Dokument č. / Document No. FIRES-FR-054-09-ACNE

Príloha č./Appendix No. 59

Odchyłka wymiarów nietolerowanych	Grubość [mm] –	Materiał: Gatunek: Stal cynkowana galwanicznie; Nr normy	Masa [kg]	Podziałka 2:1	Format A4; Arkusz; Arkuszy		
Projektował: J.GROCHOWSKI	Data: 20.10.05	Nazwa rysunku: PGM..../1					
Rysował: J.Grochowski	Data: 20.10.05						
Sprawdził: T.WŁODARCZYK	Data: 20.10.05						
Zatwierdził: J.KLICZEK	Data: 20.10.05				Nr zmiany		
BAAS® Profesjonalne Systemy Tras Kablowych		Nr rysunku					



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Dátum/Date 21.04.2009

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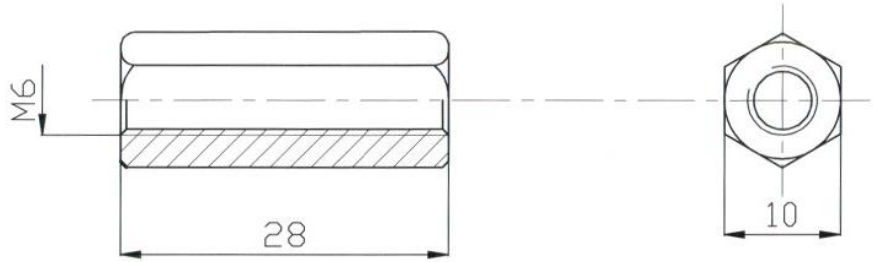
Príloha č./Appendix No. 60

	NP10.30			11SMnZ8Pb30		
Nr części	Nazwa części			Materiał	Wymiary	Nr rysunku lub normy
Konstruktor				DROMET		
Sprawdził						
Zatwierdził						
Kreślił						
	Nazwisko	Podpis	Data			
Podz. 2:1	Nazwa wyrobu	Nakrętka przedłużana M10				Arkusz
Szt/kpl	Nr rys.					Arkuszy



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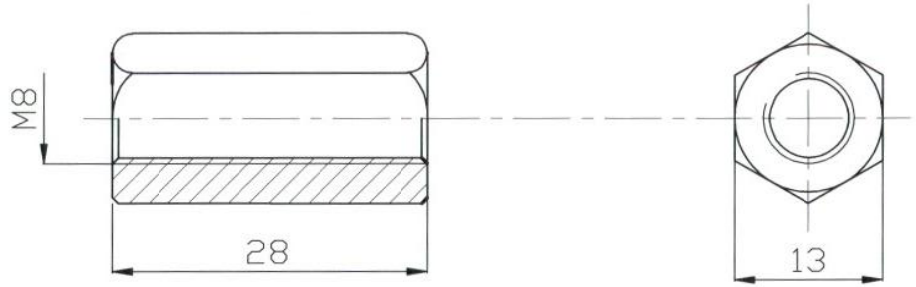
Príloha č./Appendix No. 64

	NP.6.28			11SMnZ8Pb30		
Nr części	Nazwa części			Materiał	Wymiary	Nr rysunku lub normy
Konstruktor				DROMET		
Sprawdził						
Zatwierdził						
Kreślił						
	Nazwisko	Podpis	Data			
Podz. 2:1	Nazwa wyrobu	Nakrętka przedłużana M6				Arkusz
Szt/kpl	Nr rys.					Arkuszy



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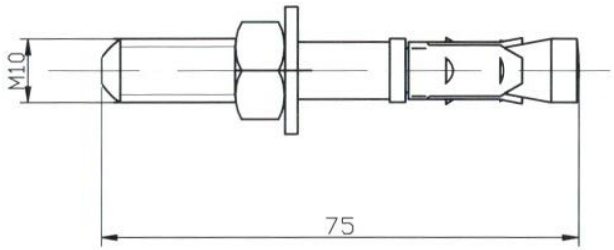
Document No. FIRES-FR-054-09-ANNE

Príloha č./Appendix No. 6.2

	NP.8.28			11SMnZ8Pb30		
Nr części	Nazwa części			Materiał	Wymiary	Nr rysunku lub normy
Konstruktor				DROMET		
Sprawdził						
Zatwierdził						
Kreślił						
	Nazwisko	Podpis	Data			
Podz. 2:1	Nazwa wyrobu	Nakrętka przedłużana M8				Arkusz
Szt/kpl	Nr rys.					Arkuszy



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Dátum/Date 01.04.2009

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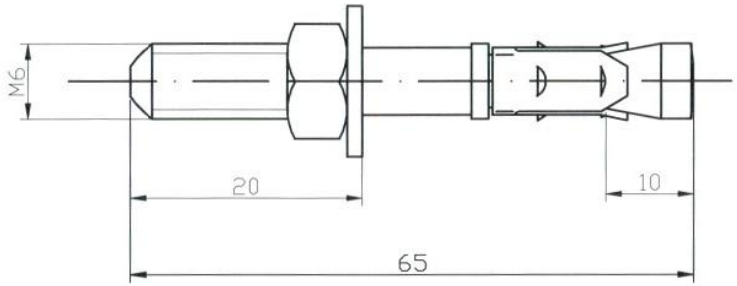
Dokument č. / Document No. FIRES-FR-054-09-ANNE

Príloha č./Appendix No. 63

	PSR10.75			S235JR	
Nr części	Nazwa części			Materiał	Wymiary	Nr rysunku lub normy
Konstruktor				DROMET		
Sprawdził						
Zatwierdził						
Kreślił						
	Nazwisko	Podpis	Data			
Podz.	Nazwa wyrobu Łącznik rozporowy PSR M10x75				Arkusz
Szt/kpl	Nr rys.				Arkuszy



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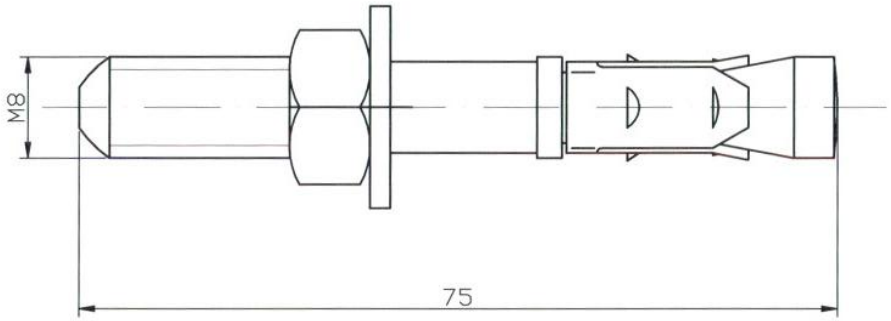
Dokument č./Document No. FIRES-FR-054-09-ANNEX

Príloha č./Appendix No. 6/9

	PSR.6.65			S235JR		
Nr części	Nazwa części			Materiał	Wymiary	Nr rysunku lub normy
Konstruktor				DROMET		
Sprawdził						
Zatwierdził						
Kreślił						
	Nazwisko	Podpis	Data			
Podz.	Nazwa wyrobu Łącznik rozporowy PSR M6x65					Arkusz
Szt/kpl	Nr rys.					Arkuszy



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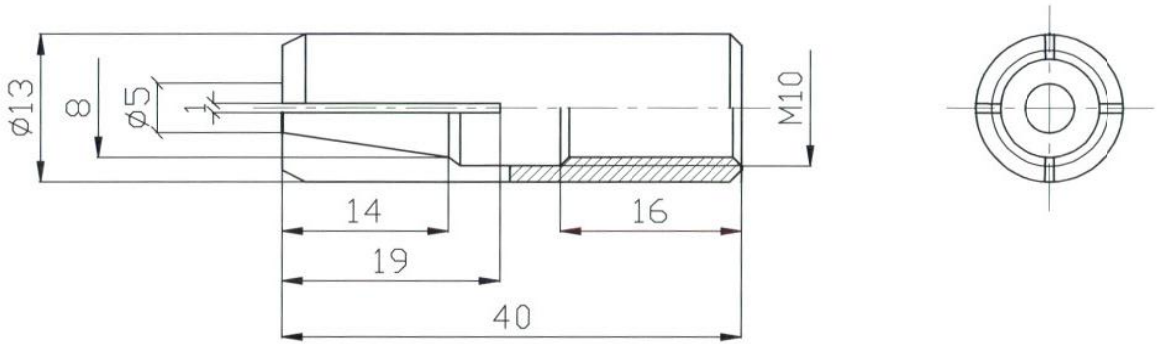
Dokument č.
Document No. FIRES-FR-054-09-AJUE

Príloha č./Appendix No. 6.5

	PSRn.8.75			S235JR		
Nr części	Nazwa części			Materiał	Wymiary	Nr rysunku lub normy
Konstruktor				**DROMET**		
Sprawdził						
Zatwierdził						
Kreślił						
	Nazwisko	Podpis	Data			
Podz.	Nazwa wyrobu Łącznik rozporowy PSRn M8x75					Arkusz
Szt/kpl	Nr rys.					Arkuszy



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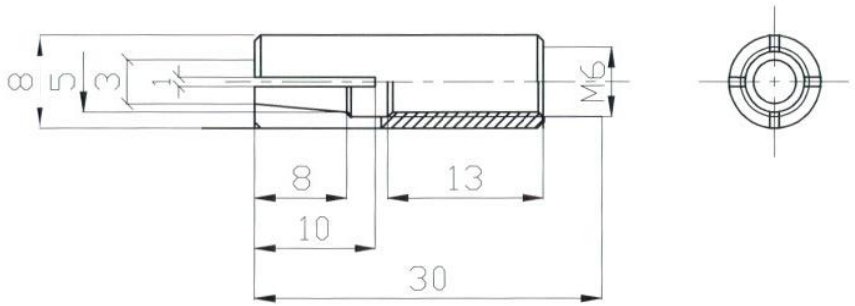
02.04.2009

Podpis/Signature

Dokument č.
Document No. FIRES-FR-054-09-ANJE

Príloha č./Appendix No. 66

	TRS10.40			S235JR		
Nr części	Nazwa części			Materiał	Wymiary	Nr rysunku lub normy
Konstruktor				DROMET		
Sprawdził						
Zatwierdził						
Kreślił						
	Nazwisko	Podpis	Data			
Podz. 2:1	Nazwa wyrobu Tuleja rozprężna stalowa M10x40					Arkusz
Szt/kpl	Nr rys.					Arkuszy



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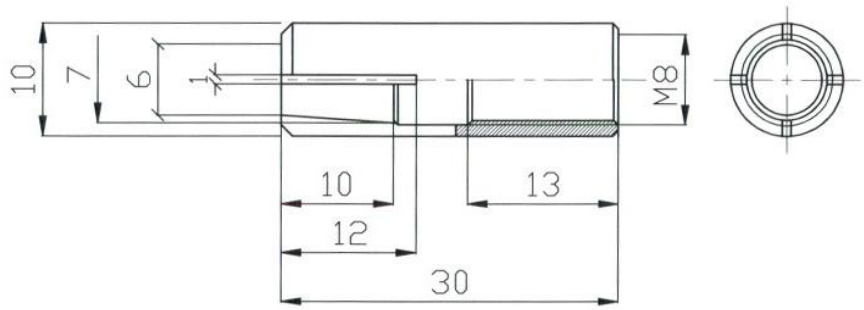
Dátum/Date 02.04.2009

Podpis/Signature

Dokument č. / Document No. FIRES-FR-054-09-PAVE

Príloha č./Appendix No. 6.2

	TRS.6.25			S235JR		
Nr części	Nazwa części			Materiał	Wymiary	Nr rysunku lub normy
Konstruktor				DROMET		
Sprawdził						
Zatwierdził						
Kreślił						
	Nazwisko	Podpis	Data			
Podz. 2:1	Nazwa wyrobu Tuleja rozprężna stalowa M6x25					Arkusz
Szt/kpl	Nr rys.					Arkuszy



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Podpis/Signature

Dokument č. / Document No. FIRES-FR-054-09-ANJE

Príloha č./Appendix No. 68

	TRS.8.30			S235JR		
Nr części	Nazwa części			Materiał	Wymiary	Nr rysunku lub normy
Konstruktor				DROMET		
Sprawdził						
Zatwierdził						
Kreślił						
	Nazwisko	Podpis	Data			
Podz. 2:1	Nazwa wyrobu Tuleja rozprężna stalowa M8x30					Arkusz
Szt/kpl	Nr rys.					Arkuszy