

TEST REPORT FIRES-FR-057-09-AUNE

**Cable bearing system BAKS with TECHNOKABEL cables
and dowels DROMET**



This is an electronic version of a test report which was made as a copy of test report officially issued in a paper form. The electronic version of a test report shall be used only for informative purposes. Any information listed in this test report is the property of the sponsor and shall not be used or published without written permission. Contents of this file may only be modified by the editor i.e. Testing laboratory FIRES s.r.o. Batizovce. Sponsor is allowed to publish this test report in parts only with written permission of the editor.

FIRES, s.r.o.

Notifikovaná osoba č./ Notified Body No.: 1396
Autorizovaná osoba reg. č./Approved Body No.: SK01
Osloboditeľov 282, 059 35 Batizovce, Slovakia
Tel.+421 52 775 2298, Fax+421 52 7881412, www.fires.sk



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

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

Number of pages: 8

Number of appendices: 68

Test reports: 7

Copy No.: 4

Distribution list:

Copy No.1: **FIRES, s.r.o.**, Osloboditeľov 282, SK-059 35 Batizovce, Slovakia (electronic version)

Copy No.2: **BAKS Kazimierz Sielski**, ul. Jagodne 5, 05-480 Karczew, Poland (electronic version)

Copy No.3: **TECHNOKABEL S.A.**, Nasielska 55, 04-343 Warszawa, Poland (electronic version)

Copy No.4: **DROMET Sp.J.**, ul. 3 maja 4, 96-313 Jaktorów, Chylice Kolonia, Poland (electronic version)

Copy No.5: **BAKS Kazimierz Sielski**, ul. Jagodne 5, 05-480 Karczew, Poland

Copy No.6: **TECHNOKABEL S.A.**, Nasielska 55, 04-343 Warszawa, Poland

Copy No.7: **DROMET Sp.J.**, ul. 3 maja 4, 96-313 Jaktorów, Chylice Kolonia, Poland

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 Rel'ovský

This report includes accreditation mark SNAS with additional mark ILAC-MRA. These marks confirm that all activities carried out by FIRES s.r.o. Batizovce, recorded in this report, are in according accreditation rules and under supervision of SNAS. SNAS is signatory of ILAC-MRA, Mutual recognition agreement (of accreditation), which is focused on promoting of international acceptance of accredited laboratory data and reducing technical barriers to trade, such as the retesting of products on markets of signatories. More information about ILAC-MRA is on www.ilac.org. Signatories of ILAC-MRA are e.g. SNAS (Slovakia), CAI (Czech Republic), PCA (Poland), DAP (Germany) or BMWA (Austria). Up to date list of ILAC-MRA signatories is on www.ilac.org/documents/mra_signatories.pdf.
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 08 524 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 O₂ 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 HDGsz0 3x1,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 56B: cable HDGsz0 3x1,5 FE180 PH90/E30-E90	64 minutes
Specimen 57A: cable HDGsz0 3x1,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 57B: cable HDGsz0 3x1,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 58A: cable HDGsz0 3x1,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 58B: cable HDGsz0 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 HDGsekwz0 3x1,5 FE180 PH90/E30-E90	78 minutes
Specimen 60B: cable HDGsekwz0 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 HDGsz0 3x1,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 62B: cable HDGsz0 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 HDGsekwz0 3x1,5 FE180 PH90/E30-E90	37 minutes
Specimen 65B: cable HDGsekwz0 3x1,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 66A: cable HDGsz0 3x1,5 FE180 PH90/E30-E90	50 minutes
Specimen 66B: cable HDGsz0 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 HDGsekwz0 3x1,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 69B: cable HDGsekwz0 3x1,5 FE180 PH90/E30-E90	76 minutes
Specimen 70A: cable HDGsz0 3x1,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 70B: cable HDGsz0 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.

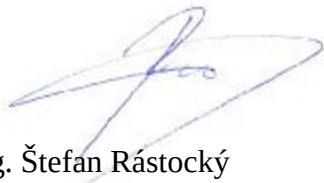
Specimens S1 – S50 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Specimens S52 – S72 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.

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.

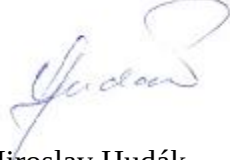
Report checked by: Ing. Štefan Rástocký

Issued by:


Ing. Štefan Rástocký
leader of the testing laboratory



Responsible for the technical side of this report:


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

8. LIST OF APPENDICES

Appendix 1	Measured values inside the test furnace
Appendix 2	Measured values inside the test furnace / graph
Appendix 3	Measured times of tested specimens from S1 to S8
Appendix 4	Measured times of tested specimens from S9 to S16
Appendix 5	Measured times of tested specimens from S17 to S24
Appendix 6	Measured times of tested specimens from S25 to S32
Appendix 7	Measured times of tested specimens from S33 to S41
Appendix 8	Measured times of tested specimens from S42 to S50
Appendix 9	Measured times of tested specimens from S52 to S59
Appendix 10	Measured times of tested specimens from S60 to S67
Appendix 11	Measured times of tested specimens from S68 to S72
Appendix 12 - 13	Layout of cables in the test furnace
Appendix 14 - 15	Photos taken before and after the fire test
Appendix 16 - 68	Drawings

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

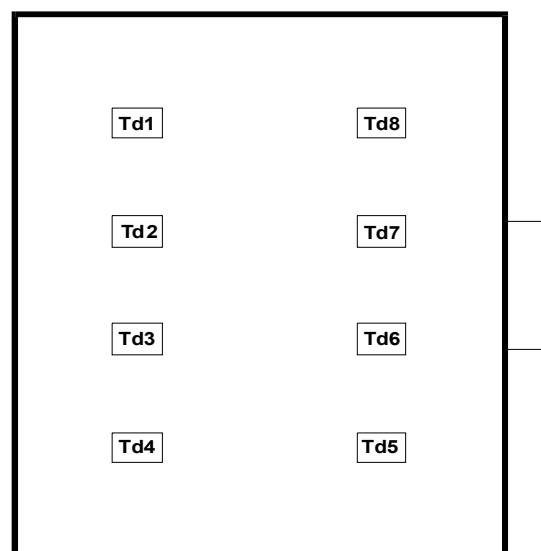
Tn Standard temperature in the test furnace laid down to test guideline

To Ambient temperature

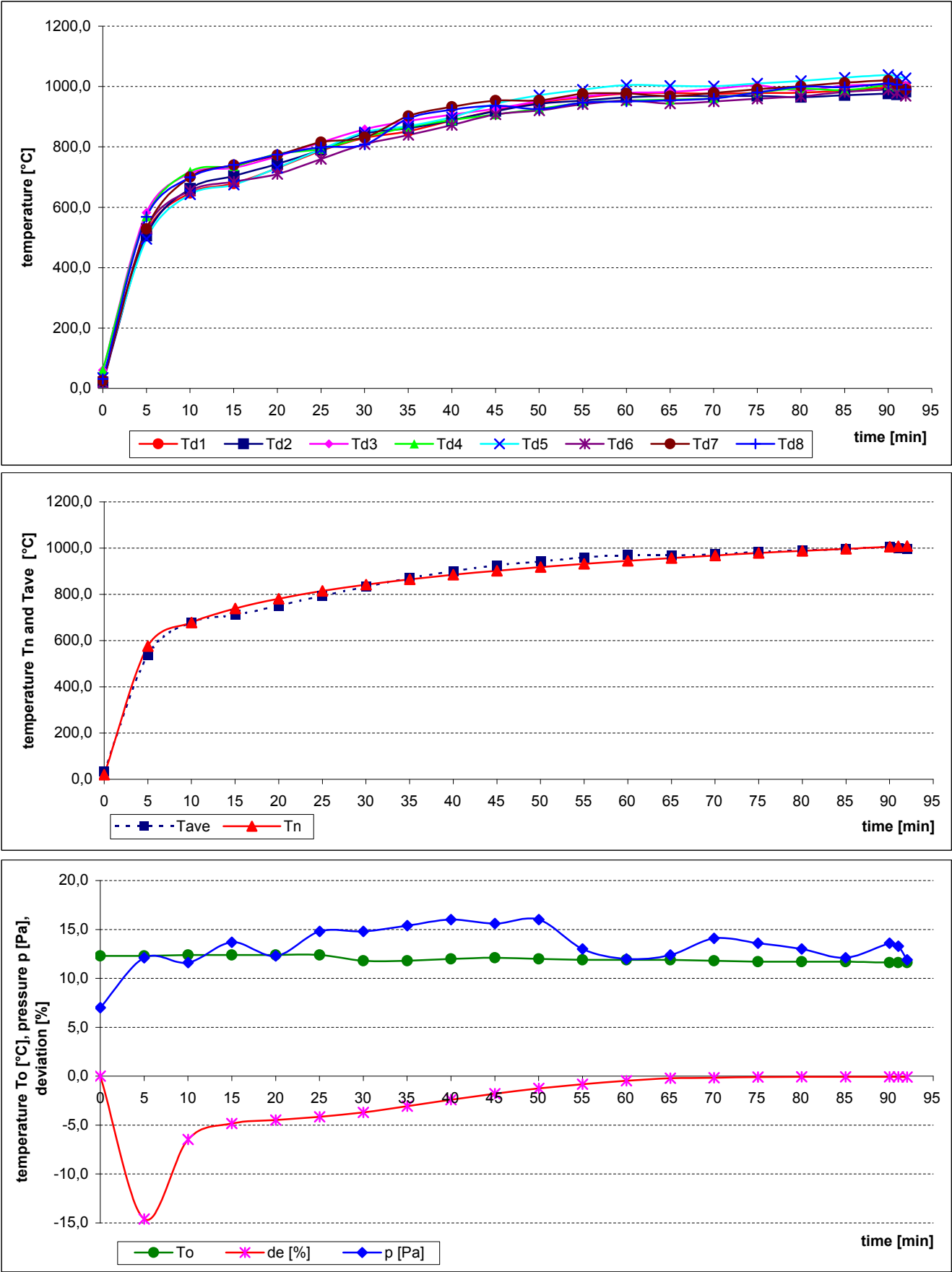
d_e Deviation of the average temperature from the standard temperature calculated according to test guideline

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 HDGszs 3x1,5 FE180 PH90/E30-E90
Specimens 57: cables HDGszs 3x1,5 FE180 PH90/E30-E90
Specimens 58: cables HDGszs 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 diodes 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

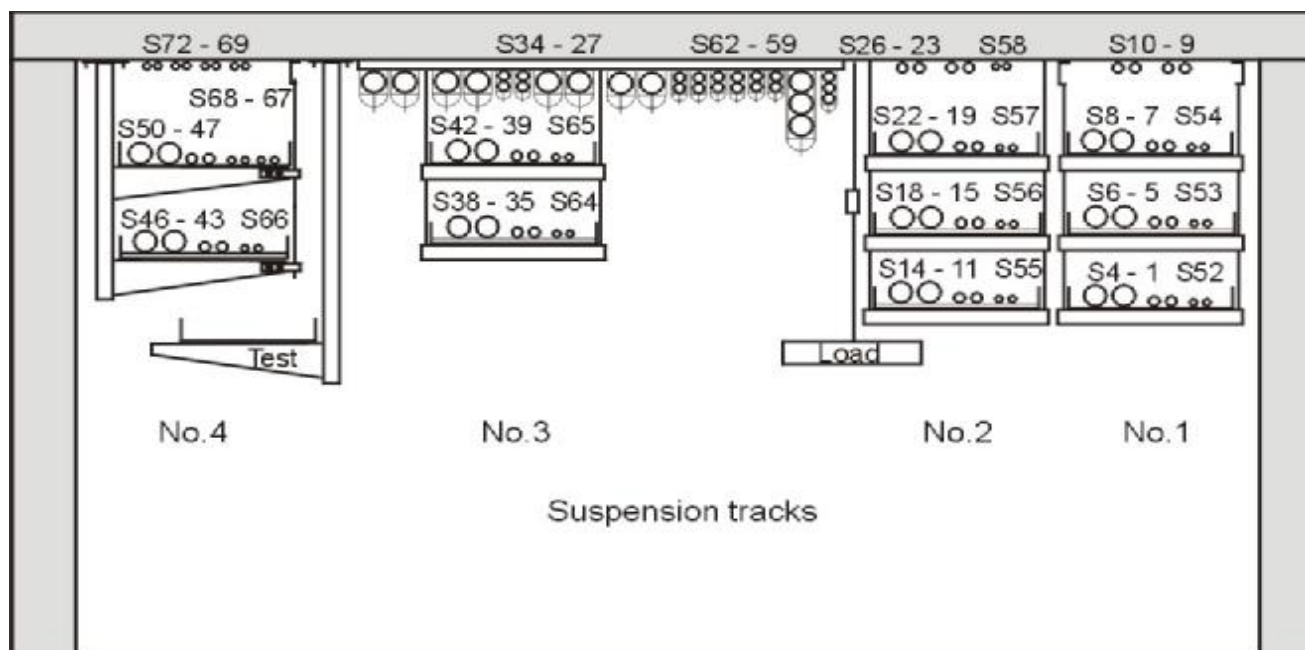
Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S68A	273-L	no failure / interruption
	274-PEN	no failure / interruption
S68B	275-L	67:42
	276-PEN	x
S69A	277-L	no failure / interruption
	278-PEN	no failure / interruption
S69B	279-L	76:39
	280-PEN	x
S70A	281-L	no failure / interruption
	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

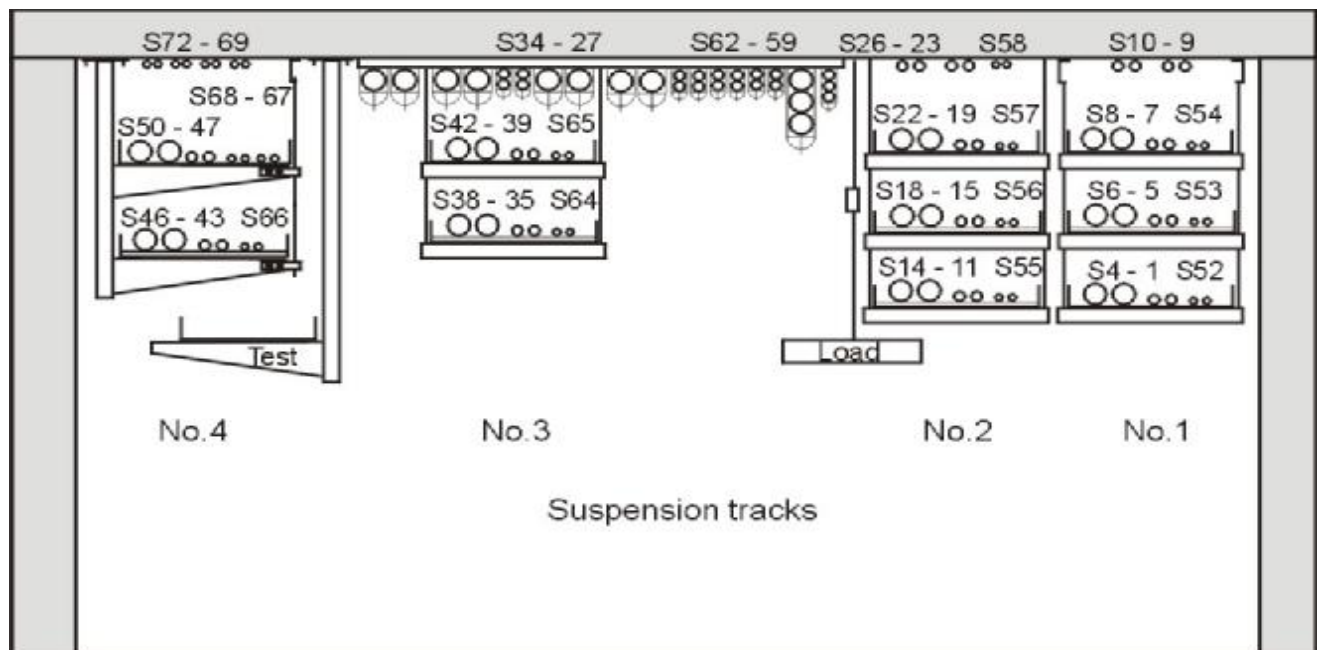
Signal cables were tested by three-phase voltage supply 1 x 110V with LED diods 3V / 0,03W.
Circuit breakers with rating 3 A were used.

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	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.1
Specimen 5: cables (N)HXCH 4x1,5/1,5 RE FE180 PH90/E90	
Specimen 6: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	Specimens placed in the trays KCOP 400H60/3N (BAKS). Suspension track No.1
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 ceiling clips UDF (BAKS) in spacing of 600 mm.
Specimen 8: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	
Specimens 54: cables HLGs 2x1,0 FE180 PH90/E30-E90	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.2
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 placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.2
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 placed in the trays KCOP 400H60/3N (BAKS). Suspension track No.2
Specimens 55: cables HLGsekw 2x1,0 FE180 PH90/E30-E90	
Specimens 15, 16: cables (N)HXH 4x1,5 RE FE180 PH90/E90	Specimens placed in ceiling clips UDF (BAKS) in spacing of 600 mm.
Specimens 17, 18: cables (N)HXH 4x50 RM FE180 PH90/E90	
Specimens 56: cables HDGszo 3x1,5 FE180 PH90/E30-E90	Specimens placed in ceiling profile ledges SDOC 1000 with clips UKO2 (BAKS) in spacing of 600 mm.
Specimens 19, 20: cables (N)HXH 4x1,5 RE FE180 PH90/E90	
Specimens 21, 22: cables (N)HXH 4x50 RM FE180 PH90/E90	Specimens placed in ceiling profile ledges SDOC 1000 with clips UKO1 (BAKS) in spacing of 600 mm.
Specimens 57: cables HDGszo 3x1,5 FE180 PH90/E30-E90	
Specimen 23: cables (N)HXCH 4x50/25 RM FE180 PH90/E90	
Specimen 24: cables (N)HXH 4x50 RM FE180 PH90/E90	
Specimens 58: cables HDGszo 3x1,5 FE180 PH90/E30-E90	
Specimen 25: cables NHHX-J 4x1,5 RE FE180 PH90/E90	
Specimen 26: cables NHHX-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	
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

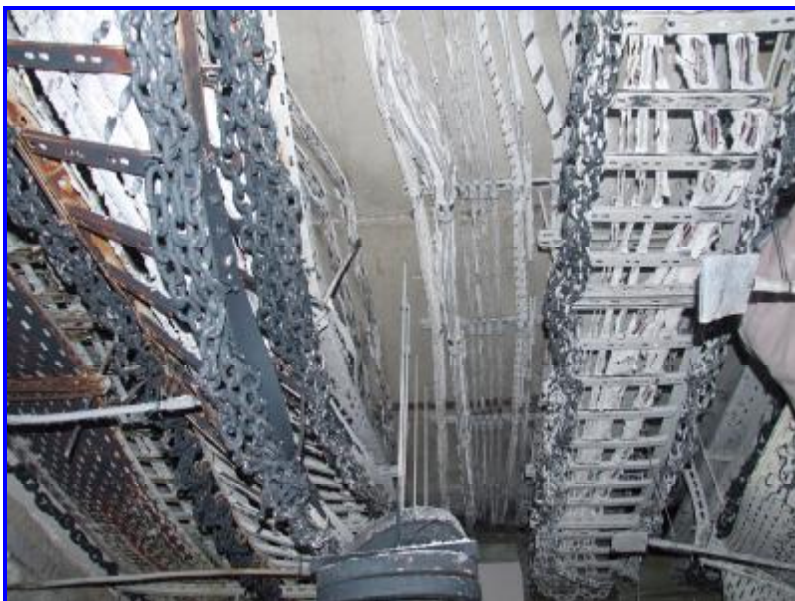


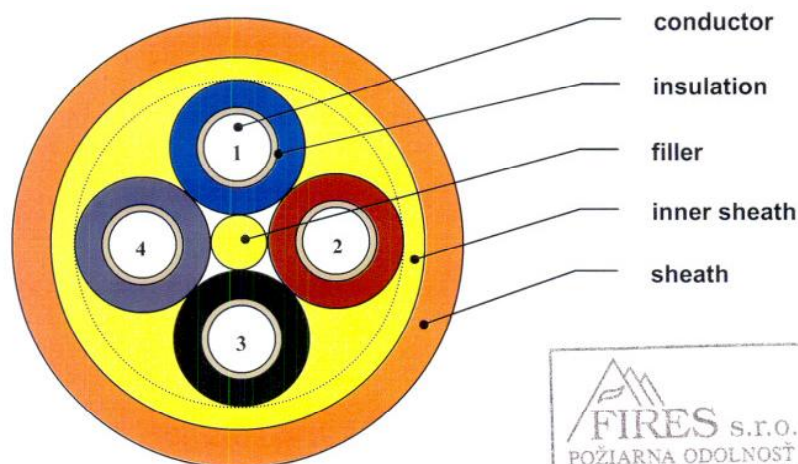
Specimens 35, 36: cables (N)HXH 4x1,5 RE FE180 PH30/E30	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.3
Specimens 37, 38: cables (N)HXH 4x50 RM FE180 PH30/E30	
Specimens 64: cables HLGs 2x1,0 FE180 PH90/E30-E90	
Specimens 39, 40: cables (N)HXH 4x1,5 RE FE180 PH30/E30	Specimens 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 placed in ceiling clips UEF (BAKS) in spacing of 600 mm.
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	

Photos taken before the test



Photos taken after the termination of the test



(N)HXH FE180 PH30/E30 0,6/1 kV**FIRE RESISTANT HALOGEN FREE POWER CABLES**

 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>04.04.2009</i>
	<i>[Signature]</i> Podpis/Signature
	Dokument č. Document No. <i>FIRES-FR-054-09-AWE</i>
Príloha č./Appendix No. <i>16</i>	

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%). |

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	Operating temperature range	
Voltage test	4.0 kV rms	during operation	from -15 to +90°C
Insulation resistivity at 90°C, minimum	1 x 10 ¹¹ Ω·cm	during installation	from -5 to +70°C
Inductance, approximate	0.7 mH/km	Minimum bending radius	12 x cable diameter
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2		Cable combustibility	flame retardant
pH, approximate	6.8	Circuit integrity *	
conductivity, approximate	0.4 µS/mm	E30	DIN 4102-12
Smoke density per PN-EN 50268-2-3, IEC 61034-2		PH30	PN-EN 50200 or PN-EN 50362
light transmittance, minimum	94%	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

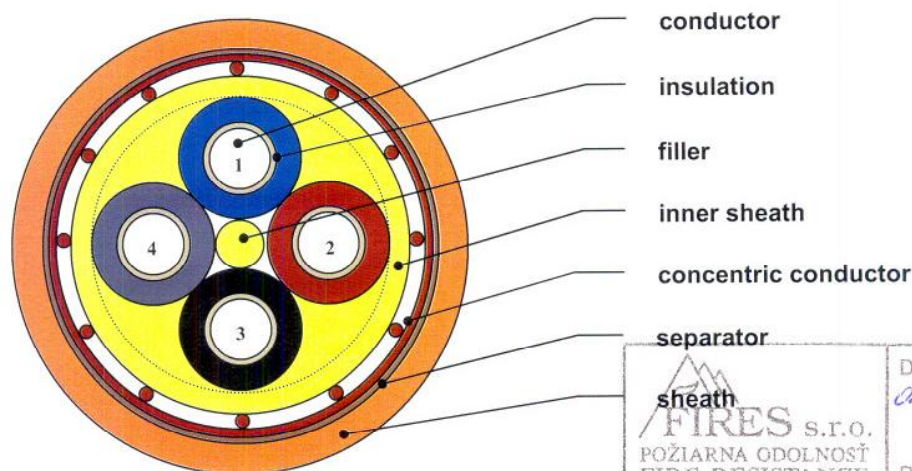
Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)	Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm ²	mm	kg/km	kg/km		mm ²	mm	kg/km	kg/km
	1 x 16 RE	10	154	238		3 x 16 RE	22	461	931
	1 x 25 RM	12	240	337		3 x 25 RM	25	720	1321
	1 x 35 RM	13	336	428					0
	1 x 50 RM	14	480	551		4 x 1,5 RE	15	58	266
	1 x 70 RM	16	672	751		4 x 2,5 RE	16	96	304
	1 x 95 RM	18	912	1049		4 x 4,0 RE	17	154	390
	1 x 120 RM	19	1152	1299		4 x 6,0 RE	18	230	499
	1 x 150 RM	21	1440	1617		4 x 10 RE	20	384	698
	1 x 185 RM	23	1776	1950		4 x 16 RM	23	614	1083
	1 x 240 RM	27	2304	2597		4 x 25 RM	27	960	1539
	2 x 1,5 RE	14	29	252		4 x 35 RM	29	1344	1948
	2 x 2,5 RE	14	48	299		4 x 50 RM	32	1920	2607
	2 x 4,0 RE	15	77	356		5 x 1,5 RE	17	72	309
	2 x 6,0 RE	16	115	423		5 x 2,5 RE	18	120	385
	2 x 10 RE	18	192	556		5 x 4,0 RE	19	192	485
	2 x 16 RE	20	307	741		5 x 6,0 RE	20	288	618
	2 x 25 RM	24	480	879		5 x 10 RE	22	480	855
	3 x 1,5 RE	14	43	299		5 x 16 RE	26	768	1292
	3 x 2,5 RE	15	72	337		5 x 25 RM	30	1200	1900
	3 x 4,0 RE	16	115	413		5 x 35 RM	32	1680	2423
	3 x 6,0 RE	17	173	499		5 x 50 RM	37	2400	3381
	3 x 10 RE	19	288	656		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.

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

FIRE RESISTANT HALOGEN FREE POWER CABLES



	Datum/Date 04.04.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. FIRES-FR-054-09-ANKE	
Příloha č./Appendix No. B	

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%). |

(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 ÷ 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV	Operating temperature range	
Voltage test	4.0 kV rms	during operation	from -15 to +90°C
Insulation resistivity at 90°C, minimum	1 x 10 ¹¹ Ω·cm	during installation	from -5 to +70°C
Inductance, approximate	0.7 mH/km	Minimum bending radius	12 x cable diameter
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2		Cable combustibility	flame retardant
pH, approximate	6.8	Circuit integrity *	
conductivity, approximate	0.4 μS/mm	E30	DIN 4102-12
Smoke density per PN-EN 50268-2-3, IEC 61034-2		PH30	PN-EN 50200 or PN-EN 50362
light transmittance, minimum	94%	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.

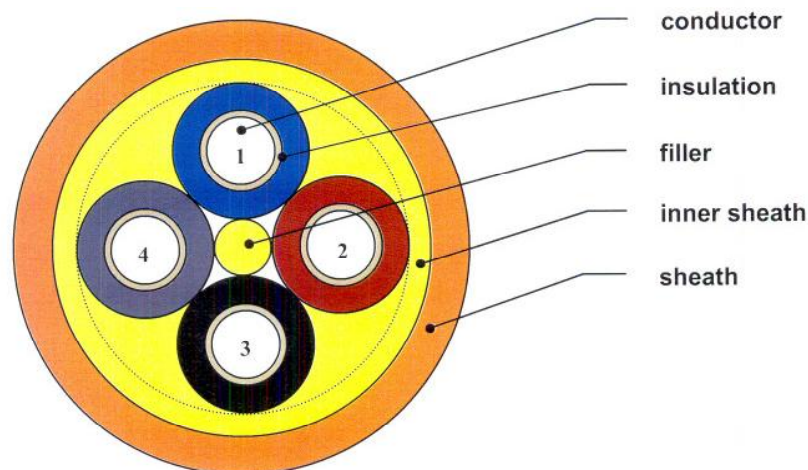
CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)	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		mm ²	mm	kg/km	kg/km
	3 x 1,5RE/1,5	16	66	266		4 x 6,0 RE/6,0	22	297	732
	3 x 2,5 RE/2,5	17	104	352		4 x 10 RE/10	25	504	1083
	3 x 4,0 RE/4,0	18	161	454		4 x 16 RE/16	26	796	1273
	3 x 6,0 RE/6,0	20	240	513		4 x 25 RM/16	32	1146	1995
	3 x 10 RE/10	23	408	798		4 x 35 RE/16	35	1528	2480
	3 x 16 RE/16	26	643	1159		4 x 50 RM/25	35	2205	2950
	3 x 25 RM/16	30	902	1473					
	3 x 35 RM/16	33	1190	1862		7 x 1,5RE/2,5	20	133	456
	3 x 50 RM/25	37	1723	2508		7 x 2,5 RE/2,5	21	200	561
	4 x 1,5RE/1,5	15	81	320					
	4 x 2,5 RE/2,5	19	128	475		12 x 1,5RE/2,5	25	205	698
	4 x 4,0 RE/4,0	20	200	570		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.

 FIRES s.r.o. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 02.09.2009
	Podpis/Signature <i>[Signature]</i>
	Dokument č. / Document No. <i>FIRES-FR-054-09-ANJE</i>
Priloha č. / Appendix No. <i>19</i>	

(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%).

	Datum/Date <i>02.04.2024</i>
	Podpis/Signature <i>[Signature]</i>
	Dokument č. Document No. <i>FIRES-PR-054-04-NWE</i>
Priloha č./Appendix No. <i>20</i>	

(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 ÷ 4
24 - 40	1; 1.5; 2.5

Operating voltage	0.6/1 kV	Operating temperature range	
Voltage test	4.0 kV rms	during operation	from -15 to +90°C
Insulation resistivity at 90°C, minimum	1 x 10 ¹¹ Ω·cm	during installation	from -5 to +70°C
Inductance, approximate	0.7 mH/km	Minimum bending radius	12 x cable diameter
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2		Cable combustibility	flame retardant
pH, approximate	6.8	Circuit integrity*	
conductivity, approximate	0.4 μS/mm	E90	DIN 4102-12
Smoke density per PN-EN 50268-2-3, IEC 61034-2		PH90	PN-EN 50200 or PN-EN 50362
light transmittance, minimum	94%	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.)	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		mm ²	mm	kg/km	kg/km
	1 x 16 RE	10	154	250		3 x 16 RE	22	461	980
	1 x 25 RM	12	240	355		3 x 25 RM	25	720	1390
	1 x 35 RM	13	336	450					
	1 x 50 RM	14	480	580		4 x 1,5 RE	15	58	280
	1 x 70 RM	16	672	790		4 x 2,5 RE	16	96	320
	1 x 95 RM	18	912	1070		4 x 4,0 RE	17	154	410
	1 x 120 RM	19	1152	1325		4 x 6,0 RE	18	230	525
	1 x 150 RM	21	1440	1650		4 x 10 RE	20	384	735
	1 x 185 RM	23	1776	1990		4 x 16 RM	23	614	1140
	1 x 240 RM	27	2304	2650		4 x 25 RM	27	960	1620
	2 x 1,5 RE	14	29	265		4 x 35 RM	29	1344	2050
	2 x 2,5 RE	14	48	315		4 x 50 RM	32	1920	2660
	2 x 4,0 RE	15	77	375		5 x 1,5 RE	17	72	325
	2 x 6,0 RE	16	115	445		5 x 2,5 RE	18	120	405
	2 x 10 RE	18	192	585		5 x 4,0 RE	19	192	510
	2 x 16 RE	20	307	780		5 x 6,0 RE	20	288	650
	2 x 25 RM	24	480	925		5 x 10 RE	22	480	900
	3 x 1,5 RE	14	43	315		5 x 16 RE	26	768	1360
	3 x 2,5 RE	15	72	355		5 x 25 RM	30	1200	2000
	3 x 4,0 RE	16	115	435		5 x 35 RM	32	1680	2550
	3 x 6,0 RE	17	173	525		5 x 50 RM	37	2400	3450
	3 x 10 RE	19	288	690		7 x 1,5 RE	18	101	375

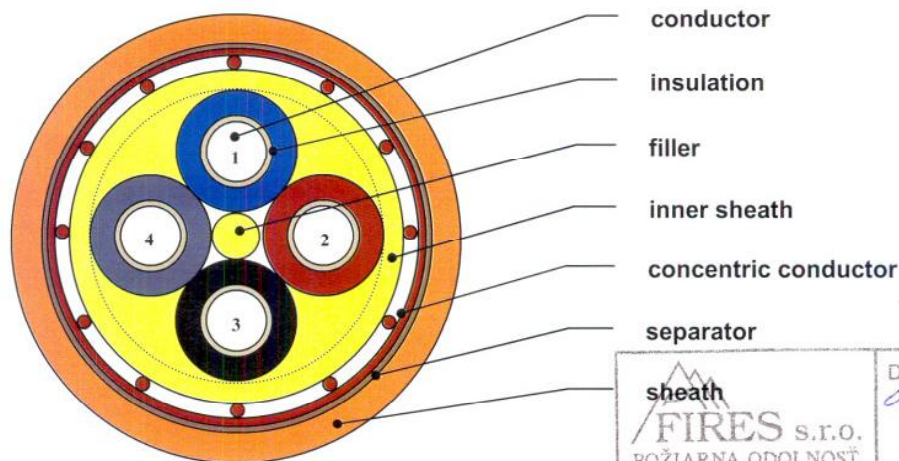
RE - single wire round conductor;

RM - multiwire round conductor

Other cross-sections and conductor counts available on request.

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

FIRE RESISTANT HALOGEN FREE POWER CABLES



sheath FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 04.09.2009 Podpis/Signature <i>[Signature]</i>
Dokument č. / Document No. <i>FIRES-FR-054-09-ANDE</i>	
Príloha č./Appendix No. <i>22</i>	

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%). |

(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	Operating temperature range	
Voltage test	4.0 kV rms	during operation	from -15 to +90°C
Insulation resistivity at 90°C, minimum	1 x 10 ¹¹ Ω·cm	during installation	from -5 to +70°C
Inductance, approximate	0.7 mH/km	Minimum bending radius	12 x cable diameter
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2		Cable combustibility	flame retardant
pH, approximate	6.8	Circuit integrity *	
conductivity, approximate	0.4 µS/mm	E90	DIN 4102-12
Smoke density per PN-EN 50268-2-3, IEC 61034-2		PH90	PN-EN 50200 or PN-EN 50362
light transmittance, minimum	94%	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.

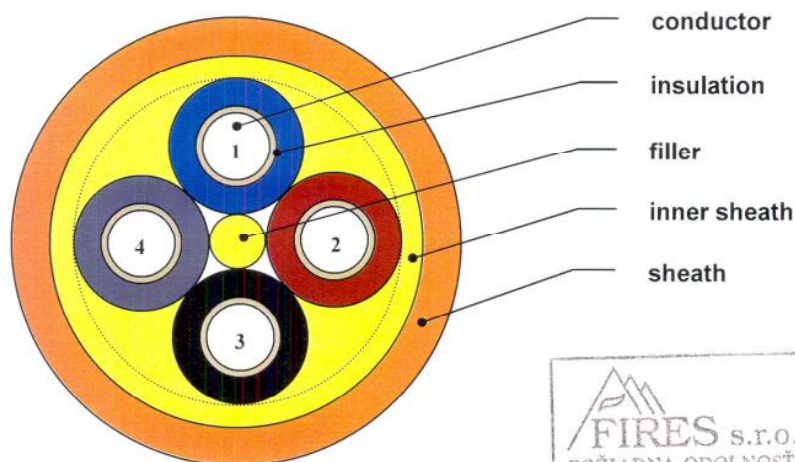
CE = the cable meets requirements of the low voltage directive 2006/95/WE

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)	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		mm ²	mm	kg/km	kg/km
	3 x 1,5RE/1,5	16	66	280		4 x 6,0 RE/6,0	22	297	770
	3 x 2,5 RE/2,5	17	104	370		4 x 10 RE/10	25	504	1140
	3 x 4,0 RE/4,0	18	161	478		4 x 16 RE/16	26	796	1340
	3 x 6,0 RE/6,0	20	240	540		4 x 25 RM/16	32	1146	2100
	3 x 10 RE/10	23	408	840		4 x 35 RE/16	35	1528	2610
	3 x 16 RE/16	26	643	1220		4 x 50 RM/25	36	2205	2995
	3 x 25 RM/16	30	902	1550					
	3 x 35 RM/16	33	1190	1960		7 x 1,5RE/2,5	20	133	480
	3 x 50 RM/25	37	1723	2640		7 x 2,5 RE/2,5	21	200	590
	4 x 1,5RE/1,5	17	81	350					
	4 x 2,5 RE/2,5	19	128	500		12 x 1,5RE/2,5	25	205	735
	4 x 4,0 RE/4,0	20	200	600		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.

 FIRES s.r.o. POZIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 02.09.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č./Document No. FIRES-FR-054-09-AWE	
Príloha č./Appendix No. 23	

NHXX FE180 PH90/E90 0,6/1 kV**FIRE RESISTANT HALOGEN FREE POWER CABLES**

 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>02.09.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FR-058-09-ANNE</i>	
Príloha č./Appendix No. <i>29</i>	

APPLICATIONS

NHXX 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%). |



 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date <i>02.09.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FR-054-09-AWE</i>	
Príloha č./Appendix No. <i>25</i>	

ISO
9001:2000**NHXX 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	Operating temperature range	
Voltage test	4.0 kV rms	during operation	from -15 to +90°C
Insulation resistivity at 90°C, minimum	1 x 10 ¹¹ Ω·cm	during installation	from -5 to +70°C
Inductance, approximate	0.7 mH/km	Minimum bending radius	12 x cable diameter
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2		Cable combustibility	flame retardant
pH, approximate	6.8	Circuit integrity *	
conductivity, approximate	0.4 μS/mm	E90	DIN 4102-12
Smoke density per PN-EN 50268-2-3, IEC 61034-2		PH90	PN-EN 50200 or PN-EN 50362
light transmittance, minimum	94%	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

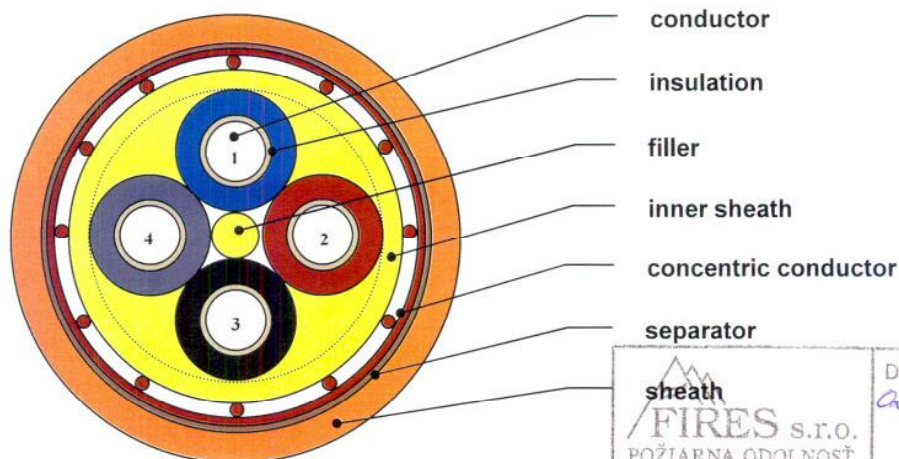
Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm ²	mm	kg/km	kg/km
	1 x 6,0 RE	8,4	58	125
	1 x 10 RE	9,4	96	170
	1 x 16 RE	10,4	154	250
	1 x 25 RM	12,4	240	355
	1 x 35 RM	13,4	336	450
	1 x 50 RM	14,5	480	580
	1 x 70 RM	16,4	672	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

RE - single wire round conductor;

RM - multiwire round conductor

Other cross-sections and conductor counts available on request.

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

NHXCH FE180 PH90/E90 0,6/1 kV**FIRE RESISTANT HALOGEN FREE POWER CABLES**

sheath FIRES s.r.o. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 01.04.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FR-054-09-AUNE</i>	
Príloha č./Appendix No. <i>26</i>	

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 Przeciwpowarowej) 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%).

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	Operating temperature range	
Voltage test	4.0 kV rms	during operation	from -15 to +90°C
Insulation resistivity at 90°C, minimum	1 x 10 ¹¹ Ω·cm	during installation	from -5 to +70°C
Inductance, approximate	0.7 mH/km	Minimum bending radius	12 x cable diameter
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2		Cable combustibility	flame retardant
pH, approximate	6.8	Circuit integrity *	
conductivity, approximate	0.4 µS/mm	E90	DIN 4102-12
Smoke density per PN-EN 50268-2-3, IEC 61034-2		PH90	PN-EN 50200 or PN-EN 50362
light transmittance, minimum	94%	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

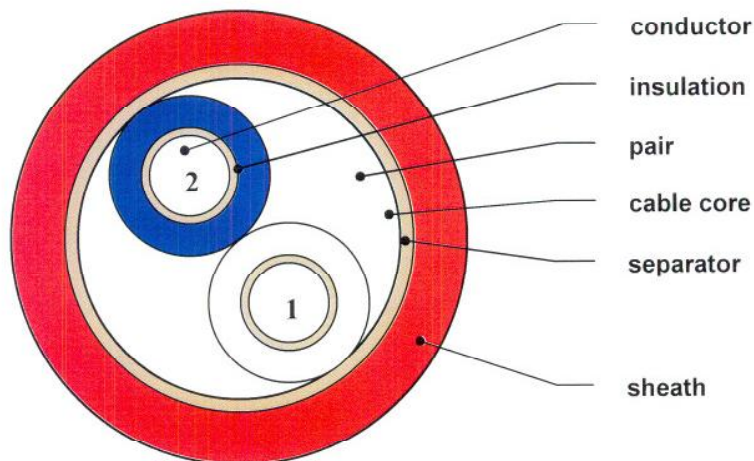
Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm ²	mm	kg/km	kg/km
	3 x 1,5RE/1,5	16,6	43,2	360
	3 x 2,5 RE/2,5	17,7	72	430
	3 x 4,0 RE/4,0	18,8	115	520
	3 x 6,0 RE/6,0	20,8	173	660
	3 x 10 RE/10	23,8	288	940
	3 x 16 RE/16	26,2	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

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

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

Other cross-sections and conductor counts available on request.

 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date
	01.04.2009
	Podpis/Signature
Dokument č. / Document No. <i>FIRES-FR-054-09-ANWE</i>	
Príloha č./Appendix No. <i>28</i>	

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%).

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
	average		60	70	70	70	100

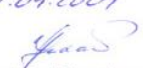
Operating voltage	240 V	Operating temperature range	
Voltage test	1.5 kV rms	during operation	from - 30 to + 80°C
Insulation resistance, minimum	100 MΩ·km	during installation	from - 5 to + 70°C
Inductance, approximate	0.7 mH/km	Minimum bending radius	10 x cable diameter
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2		Cable combustibility	flame retardant
pH, approximate	6.8	Combustibility tests	PN-EN 60332-1-2
conductivity, approximate	0.4 μS/mm	Circuit integrity *	
Smoke density per PN-EN 50268-2-3, IEC 61034-2		E30-E90	DIN 4102-12
light transmittance, minimum	94%	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

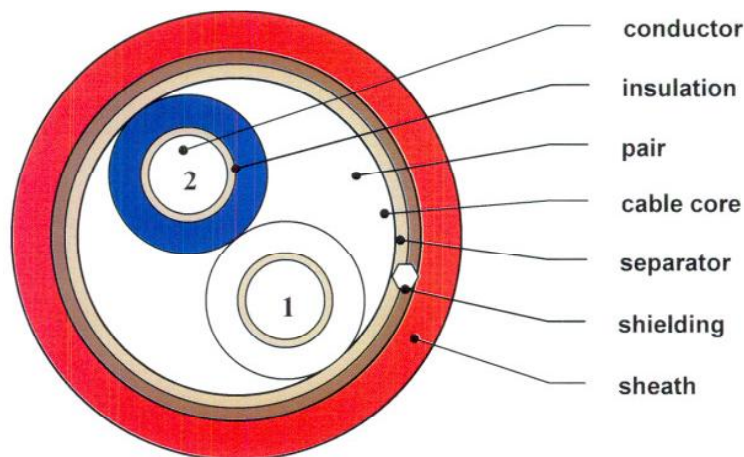
Cable type	Number of pairs (x 2) x conductor diameter	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm	mm	kg/km	kg/km
HTKSH FE180 PH90/E30-E90	1 x 2 x 0.8	6.5	10	61

Other diameters and conductor counts available on request.

 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 02.04.2009
	Podpis/Signature 
	Dokument č. Document No. FIRES-FR-054-09-AUE
Príloha č./Appendix No. 29	

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%).

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
	average		90	130	130	150	150

Operating voltage	240 V	Operating temperature range	
Voltage test	1.5 kV rms	during operation	from - 30 to + 80°C
Insulation resistance, minimum	100 MΩ·km	during installation	from - 5 to + 70°C
Inductance, approximate	0.7 mH/km	Minimum bending radius	10 x cable diameter
Corrosivity of emitted gases per PN-EN 50267-2-3, IEC 60754-2		Cable combustibility	flame retardant
pH, approximate	6.8	Combustibility tests	PN-EN 60332-1-2
conductivity, approximate	0.4 μS/mm	Circuit integrity *	
Smoke density per PN-EN 50268-2-3, IEC 61034-2		E30-E90	DIN 4102-12
light transmittance, minimum	94%	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.

 POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 02.04.2009
	Podpis/Signature <i>[Signature]</i>
	Dokument č. / Document No. FIRES-FR-054-07-PUNE
Príloha č./Appendix No. 31	

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

strona 1 z 2

PRZEWODY ELEKTROENERGETYCZNE OGNIODPORNE, BEZHALOGENOWE

		Dátum/Date 02.09.2009
FIRES S.p.A. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE		Podpis/Signature
Dokument č. Document No.		FIRES-FR-054-09-NWE
Příloha č./Appendix No.		32

ZASTOSOWANIE

Przewody elektroenergetyczne ogniodporne 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 oddymiania 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-żółta, niebieska, brązowa	brązowa, czarna i szara
4	zielono-żółta, niebieska, brązowa, czarna	czarna, niebieska i brązowa
5	zielono-żółta, 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.

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

strona 2 z 2

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°C	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 ₀ /U	300/500 V	Korozyjność wydzieli. gazów	PN-EN 50267-2-3, IEC 60754-2
Próba napięciowa	2 kV sk	pH, min.	4,3
Minimalna rezystancja izolacji w temp. 20°C	100 MΩ·km	konduktywność, max.	10 μS/cm
Indukcyjność, około	0,7 mH/km	Gęstość dymu	PN-EN 61034-2
Maksymalna dopuszczalna temperatura przy żyłach w warunkach pracy	+ 85°C	przepuszczalność światła, min.	70 %
przy zwarciu (max.5 s)	+ 250°C	Palność kabla	nie rozprzestrzeniający płomienia
Zakres temperatur pracy podczas pracy	od - 25 do + 85°C	Próby palności	PN-EN 50266-2-2, IEC 60332-3-22 (cat.A)
podczas układania	od - 10 do + 50°C	Podtrzymanie funkcji:	
Minimalny promień gięcia kable jednożyłowe	10 x średnica kabla	E30-E90	DIN 4102-12
kable wielożyłowe	6 x średnica kabla	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 część 12. Obecnie posiadamy badania przeprowadzone na systemach firm BAKS. Odstęp pomiędzy podporami dla koryt i drabinek nie mogą być większe niż 1500 mm. Odstęp 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
HLGsekw	2 x 1	6,8	19,2	55

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

 FIRES s.r.o. PRZEMISŁOWA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 01.04.2009
	Podpis/Signature <i>[Signature]</i>
Dokument №. FIRES-FR-054-09-ANNE Document No.	
www.technokabel.com.pl sprzedaz@technokabel.com.pl	

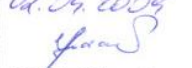
Badanie trasy kablowej BAKS - TECHNOKABEL - DROMET
Badanie w FIRES Słowacja Data 30.03-02.04.2009

Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
1			NHXH-J 4x50 RM FE180 PH90/E90	1	Korytka kablowe KCOP 400H60/... B-400 1.2 m / 10kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wyścięgnik 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	2	Drabinka kablowa DUOP 400H60/... B-400/ 1.2 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wyścięgnik WMCO400 , pręt gwintowany PGM10/..., do betonu za pomocą stalowego łącznika rozporowego PSRn M10x85 firmy Dromet.
7			NHXCH 4x50/25 RM FE180 PH90/E90		
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	Korytka 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			HDGsekwo 3x1,5 RE FE180 PH90/E30-E90		
18			HDGsekwo 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	Korytka 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		

Datum/Date
2.04.2009
Podpis/Signature
[Signature]

FIRES s.r.o.
POŽIARNA ODOLNOST
FIRE RESISTANCE
Dokument č.
Document No. FIRES-PR-059-09-AWE
Príloha č./Appendix No. 35

Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
41			HLGsekw 2x1,0 FE180 PH90/E30-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.
42			HLGsekw 2x1,0 FE180 PH90/E30-E90		
43			(N)HXCH 4x50/25 RM FE180 PH90/E90		
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			HDGsekwzo 3x1,5 RE FE180 PH90/E30-E90		
68			HDGsekwzo 3x1,5 RE FE180 PH90/E30-E90		
69			(N)HXH 4x50 RM FE180 PH90/E90	12	Uchwyt kablowy UKO1 + Szczepel 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		

 POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 02. 04. 2009
	Podpis/Signature 
Dokument č. / Document No. FIRES-FR-054-09-AME	
Príloha č./Appendix No. 36	

Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie	
86			HDGszo 3x1,5 RE FE180 PH90/E30-E90		 Dátum/Date 04.04.2009 Podpis/Signature Yas Dokument č. Document No. FIRES-FR-054-09-ANNE Príloha č./Appendix No. 34	
87			HLGs 2x1,0 FE180 PH90/E30-E90			
88			HLGs 2x1,0 FE180 PH90/E30-E90			
89			HDGsekwo 3x1,5 RE FE180 PH90/E30-E90			
90			HDGsekwo 3x1,5 RE FE180 PH90/E30-E90			
91			HLGsekw 2x1,0 FE180 PH90/E30-E90			
92			HLGsekw 2x1,0 FE180 PH90/E30-E90			
93			NHXX -J 4x50 RM FE180 PH90/E90	13	Uchwyt kablowy UKO2 + Szczepel SDOC 1000 Mocowanie do betonu co 600 mm za pomocą stalowego łącznika rozporowego PSRn M8x75 firmy Dromet	
94			NHXX -J 4x50 RM FE180 PH90/E90			
95			NHXX -J 4x50 RM FE180 PH90/E90			
96			NHXX -J 4x1,5 RE FE180 PH90/E90			
97			NHXX -J 4x1,5 RE FE180 PH90/E90			
98			NHXX -J 4x1,5 RE FE180 PH90/E90			
99			(N)HXX 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)HXX 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)HXX 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)HXX 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 przedłużoną 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

Zestawienie kabli Technokabel:

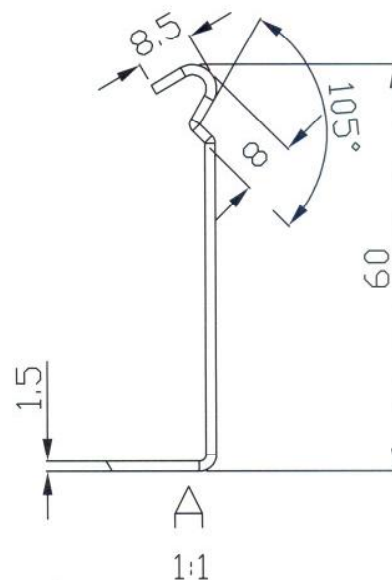
Lp	Symbol kaba	Średnica kabla	Ciężar kabla	Ilość
1	(N)HXX FE 180 PH30/E30 4x 1,5 RE	14 mm	0,28 kg/m	6
2	(N)HXX FE 180 PH30/E30 4x 50 RM	33 mm	2,60 kg/m	6
3	(N)HXCH FE 180 PH30/E30 4x 1,5/1,5 RE	15 mm	0,32 kg/m	6
4	(N)HXCH FE 180 PH30/E30 4x 50/25 RM	35 mm	2,95 kg/m	6
5	(N)HXX FE 180 PH90/E90 4x 1,5 RE	15 mm	0,31 kg/m	8
6	(N)HXX 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	NHXX-J FE 180 PH90/E90 4x 1,5 RE	16 mm	0,35 kg/m	5
10	NHXX-J FE 180 PH90/E90 4x 50 RM	33 mm	2,70 kg/m	5
11	NHXX FE 180 PH90/E90 4x 1,5/1,5 RE	17 mm	0,39 kg/m	2
12	NHXX 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	HDGsekwo 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

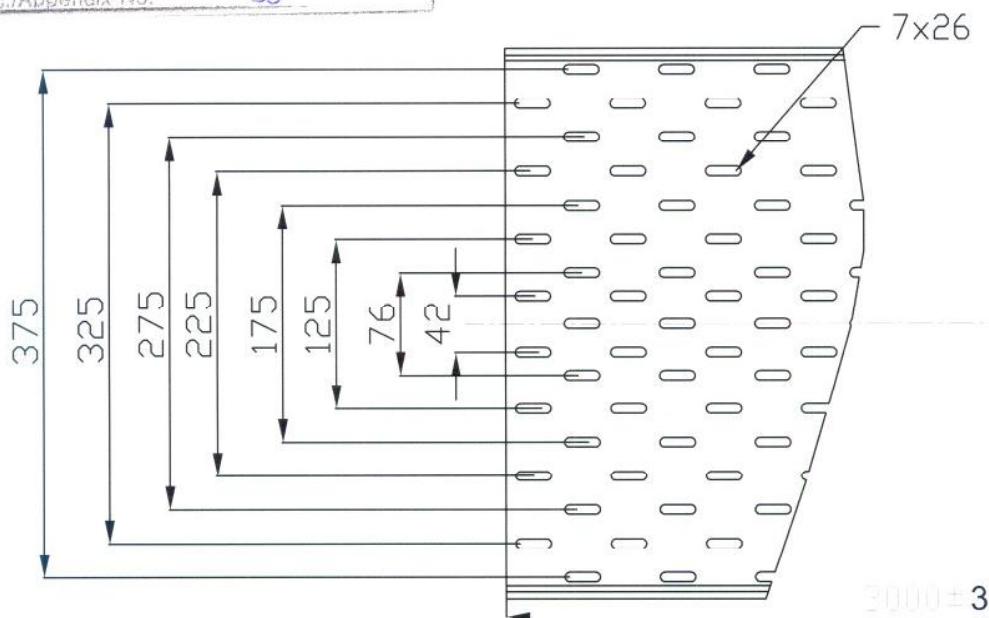
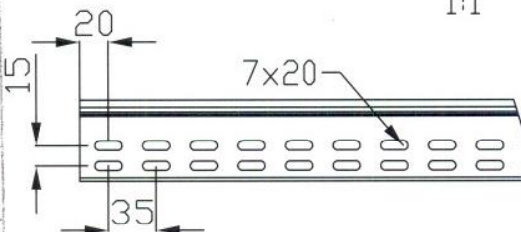
Pozycja 3 stal ocynkowana metodą Sendzimira - próba

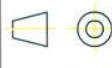
Pozycja 4, 5, 6, 7, 10, 11, 12, 14 i 15 stal ocynkowana metodą Sendzimira PN -EN 10327

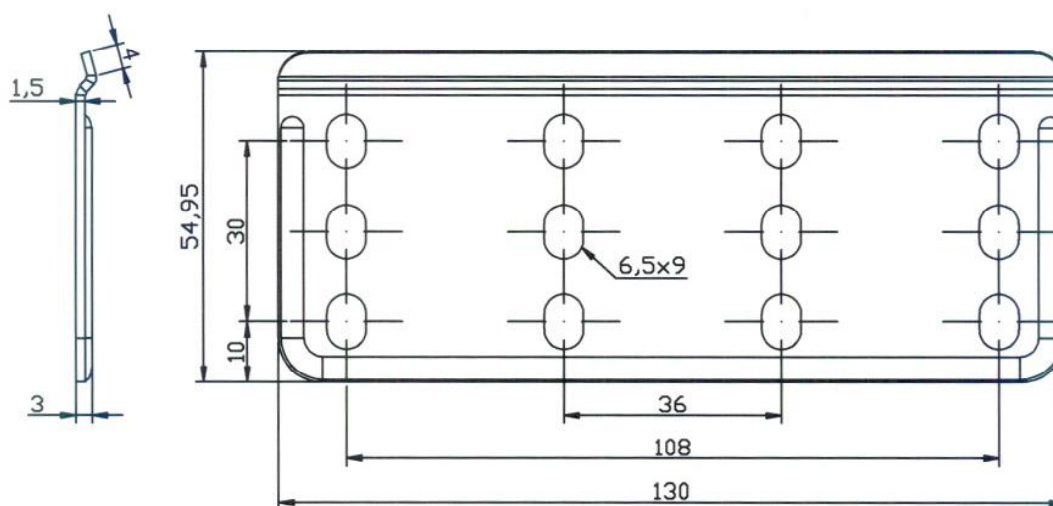
A	Typ	Nr.kat
100	KCDP100H60/3N	862010
200	KCDP200H60/3N	862020
300	KCDP300H60/3N	862030
400	KCDP400H60/3N	862040



 FIRES s.r.o. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>02.04.2009</i>
	Podpis/Signature <i>[Signature]</i>
	Dokument č. Document No. <i>FIRES-FR-054-09-ANNE</i>
	Príloha č./Appendix No. <i>38</i>

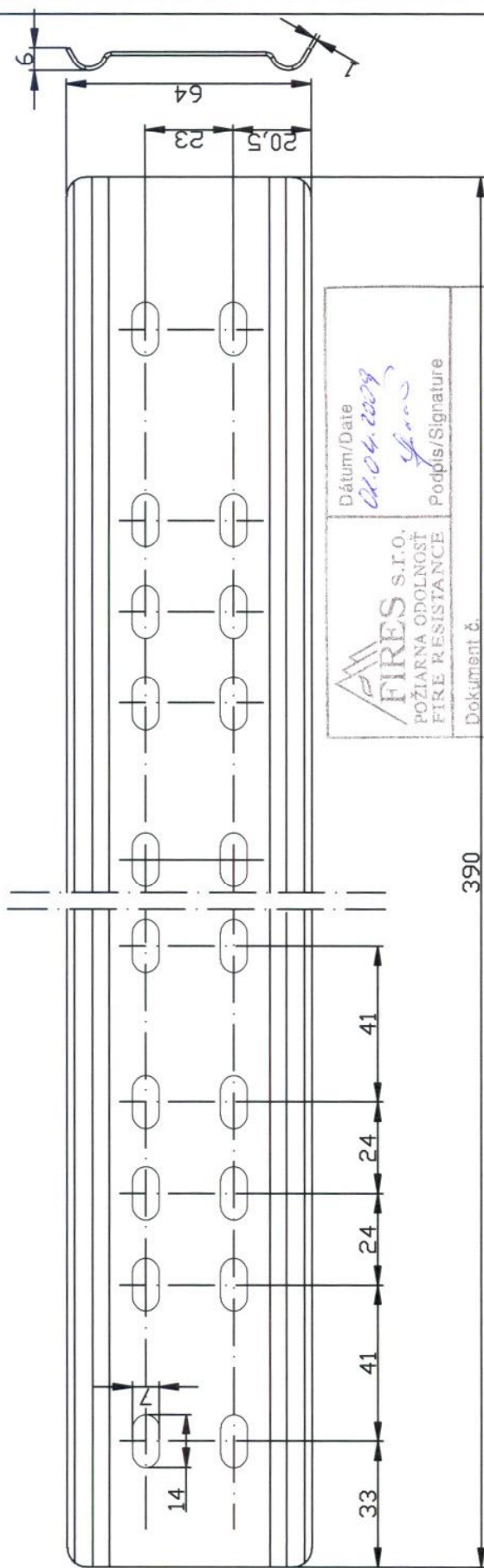


	Odczytka wyniarów nietolerowanych		Materiał		Gatunek	Masa [kg]	Podziałka	Format A4
					Nr normy	PN-EN 10142 + A1 : 1997		Arkusz
								Arkuszy
Projektował	J.GROCHOWSKI	Podpis		Data	Nazwa rysunku			
Rysował	J.Grochowski		20.10.05	KCDP400H60/3N				
Sprawdził	T.WŁODARCZYK		20.10.05					
Zatwierdził	J.KLICZEK		20.10.05	Nr programu maszynowego				
 Profesjonalne Systemy Tras Kablowych				Nr rysunku				Nr znlany
				862040				



 FIRES S.T.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Datum/Date <i>02.04.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FR-054-09-ANKE</i>	
Priloha č./Appendix No. <i>39</i>	

 Odchylka vynarůs netolerovaných			Materiál Gatunek <i>Blacha stalocynknet.Sedzinira</i> Nr normy <i>PN-EN 10327:2005</i> półfabrykat (nr normy)	Masa [kg] 0,09	Podziałka 1:1	Format <i>A4</i> Arkusz Arkuszy	
Projektant	<i>J.GROCHOWSKI</i>	Podpis _____ _____ _____	Data	Nazwa rysunku <i>LPH60N</i> <i>860700</i>			
Rysował	<i>J.Grochowski</i>		20.10.05				
Sprawił	<i>T.WŁODARCZYK</i>		20.10.05				
Zatwierdził	<i>J.KLICZEK</i>		20.10.05				
 Profesjonalne Systemy Tras Kablowych			Nr rysunku		Nr zmiany _____ _____ _____		

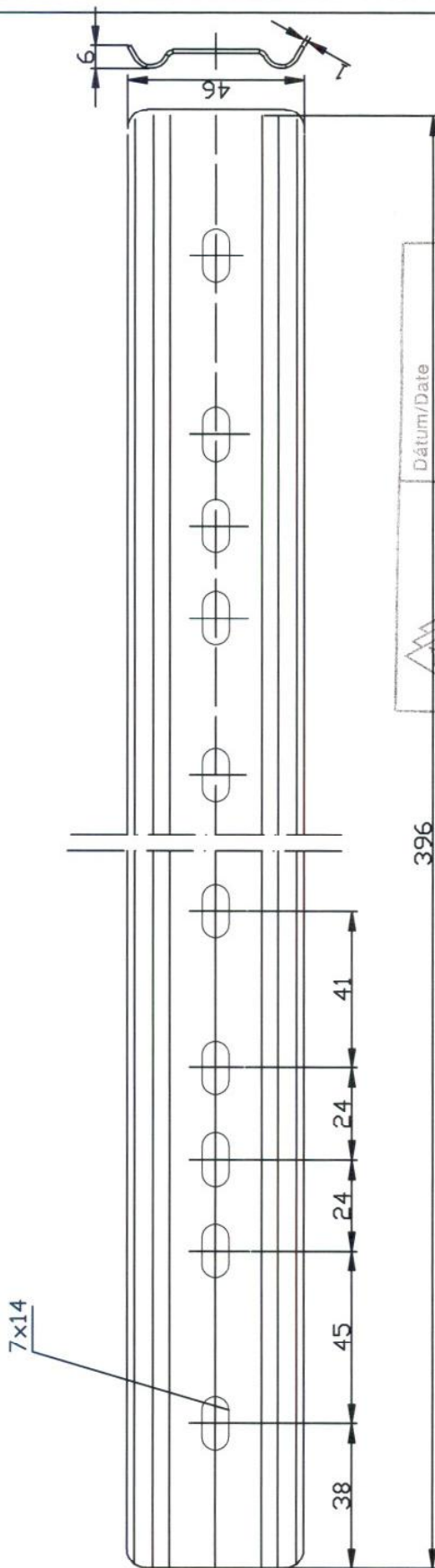


 FIRES s.r.o. POZIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 21.04.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č.	
Document No. FIRES-FR-054-09-AWE	
Príloha č./Appendix No. 40	

	Długość wypiarów nieolerowanych	Gatunek Nr normy półfabrykat (nr normy)	Blacha stal.cynk.met.Sedzinira PN-EN 10327:2005	Masa [kg] 0,24	Podziałka 1:1	Format A3 Arkusz Arkuszy
Projektował J.GROCHOWSKI	Nazwa rysunku BLD400N	Data 20.10.05	Nr rysunku 862440	Nr zblany	Nr zblany	Nr zblany
Rysował J.Grochowowski	Podpis J.Grochowowski	Data 20.10.05	Blacha łącznikowa	Nr rysunku 862440	Nr zblany	Nr zblany
Sprawdził T.WŁODARCZYK	Podpis T.Włodarczyk	Data 20.10.05	Blacha łącznikowa	Nr rysunku 862440	Nr zblany	Nr zblany
Zatwierdził J.KLICZEK	Podpis J.Kliczek	Data 20.10.05	Blacha łącznikowa	Nr rysunku 862440	Nr zblany	Nr zblany

Profesjonalne Systemy
Tras Kablowych

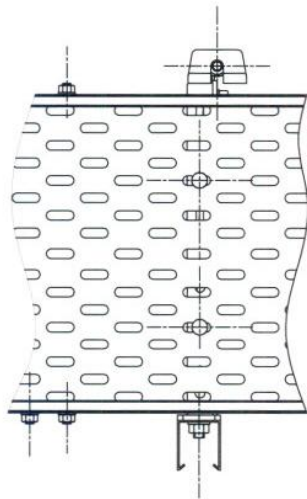




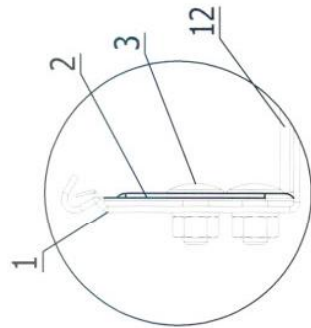
FIRE s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 21.04.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. <i>FIRE-FR-038-09-AUE</i>	
Document No. <i>48</i>	
Príloha č./Appendix No. <i>48</i>	

	Odchylka výmlarů nietolerovaných	Gatunek	Blacha stalocynk.met.Sędzimir	Masa [kg]	0,16	Podziałka	1:1	Format	A3
		Nr normy	PN-EN 10327:2005						Arkusz
			półfabrykat (nr normy)					Arkuszy	
Projektował	J.GROCHOWSKI	20.10.05	Nazwa rysunku	BZK□400N					
Rysował	J.Grochowski	20.10.05							
Sprawił	T.WŁODARCZYK	20.10.05							
Zatwierdził	J.KLICZEK	20.10.05							
Profesjonalne Systemy Tras Kablowych			Blacha zakończeniowa			Nr zmiany			
			Nr rysunku			862540			

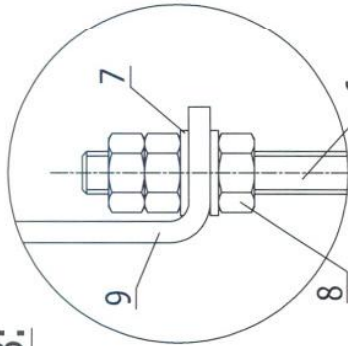
D-D



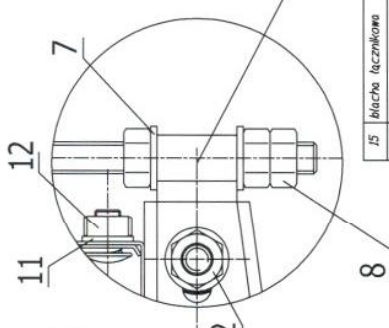
A:



B:

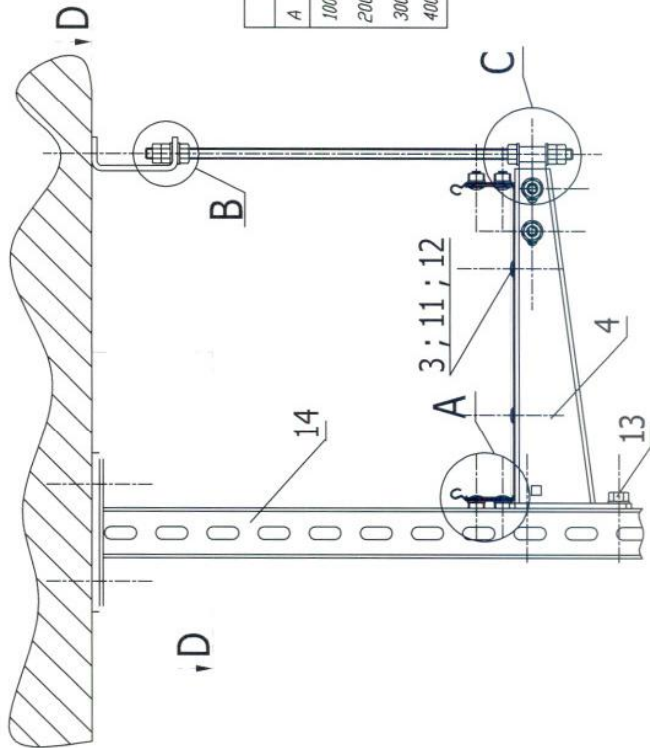


C:



10:11:12

D



Poz.1		Poz.4	
A	Typ	Typ	
100	KCDNP100H60/3	WMCD100	
200	KCDNP200H60/3	WMCD200	
300	KCDNP300H60/3	WMCD300	
400	KCDNP400H60/3	WMCD400	

15	blacha łącznikowa	BLDN400	1	862440
14	Wspornik	WPCD	1	800820
13	Sruba	SN M10x30	2	650843
12	nakrętka	NS M8	16	650144
11	podkładka	PP 8	16	650444
10	Sruba	SCMBx16	2	650443
9	uchwyt sufitowy	USDV	1	803700
8	nakrętka	NS M10	8	650244
7	podkładka	PP 10	8	650544
6	pret gwintowany	PGM10.1	1	651001
5	uchwyt	UPW1	1	803300
4	Wysięgnik	WMCD100	1	800340
3	Sruba	SGN M6x12	14	650641
2	łącznik	LFDNP460	2	860700
1	Korpus	KCDNP400H60/3	1	862040
Pos.		Benennung	Material	Katalog Nr.
Zobacz rysunek		Zeichnung-Nr.	Stück	
gezeichnet		gezeichnet	gezeichnet	Blatt 1 von 1
geprüft		geprüft	geprüft	Grosse A3
Ausst. 15		Ausst. 15	Ausst. 15	
RINNE KCDNP300H60/2 + AUSLEGER		fire		
BAKS				
DZIAŁ KONSTRUKCJI				
ul. Jagińska 5 05-480				
Karczew				
Feuerbeständig				
System				
Verfahrensforschen				

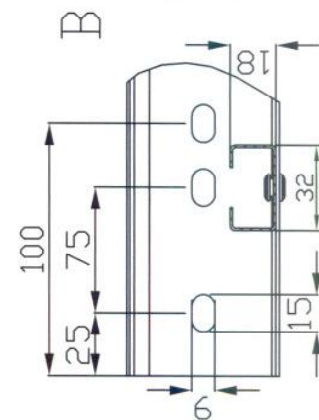
FIRES s.r.o.
POŽIARNÁ ODOLNOST
FIRE RESISTANCE

Dokument č. **FIRES-FR-054-09-AVE**
Document No. **5**

Príloha č./Appendix No. **52**

Datum/Date **02.04.2024**
Podpis/Signature *[Signature]*

This drawing and its contents is the property of the BAKS company and may not be copied or otherwise disclosed to any third party without our consent. Contraventions will be prosecuted.

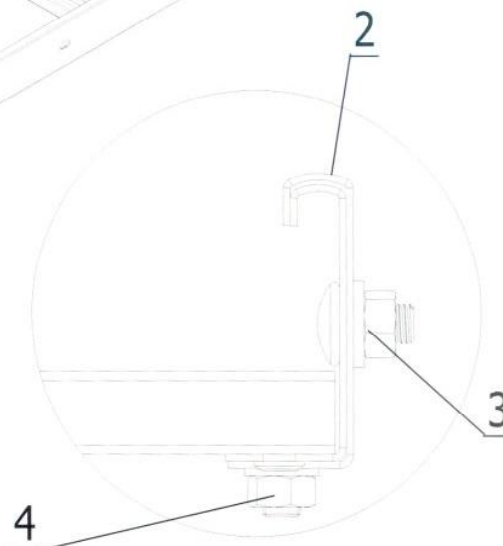
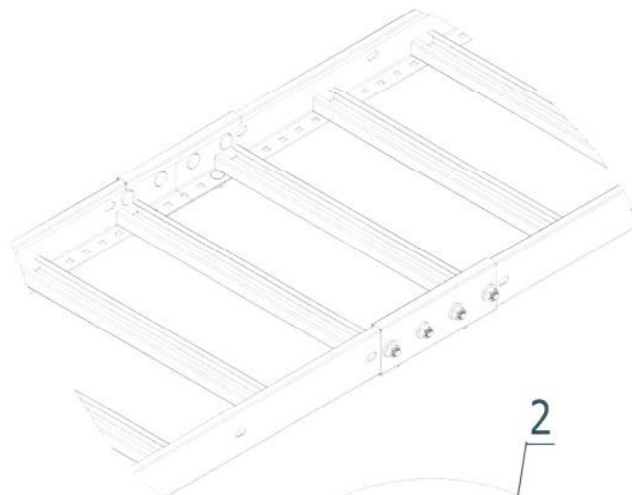
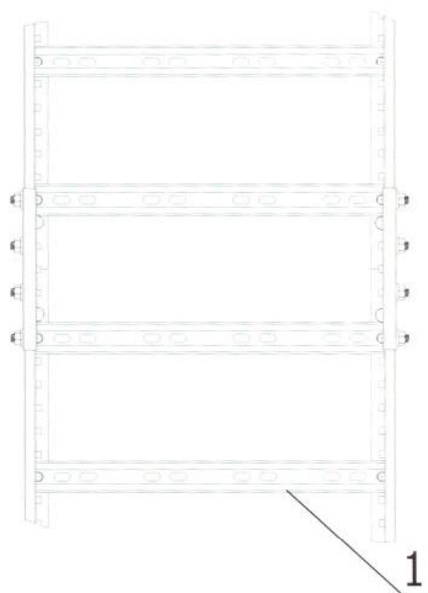


A	Typ	L	Nr. Kat	B
100	DGIMP100H60/6	6000	863010	95
200	DGIMP200H60/6	6000	863020	195
300	DGIMP300H60/6	6000	863030	295
400	DGIMP400H60/6	6000	863040	395
100	DGIMP100H60/3	3000	863013	95
200	DGIMP200H60/3	3000	863023	195
300	DGIMP300H60/3	3000	863033	295
400	DGIMP400H60/3	3000	863043	395



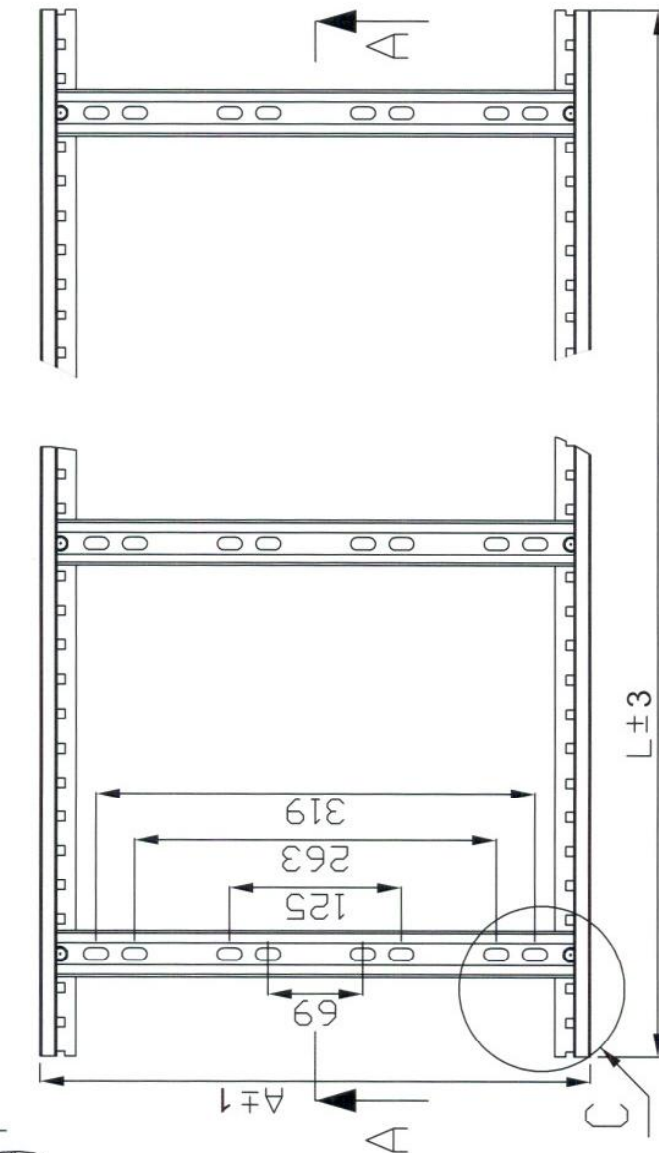
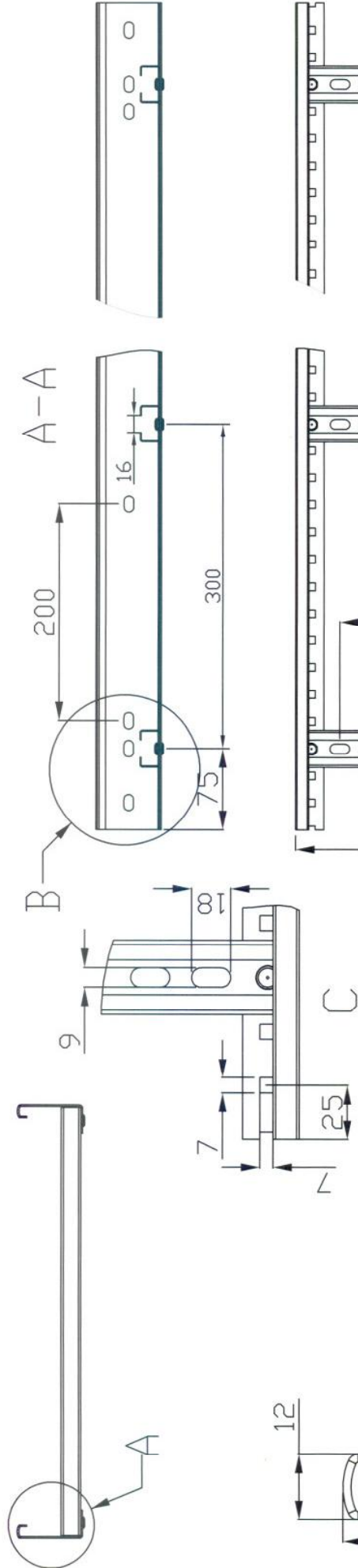
Dokument č. *FIRES-FR-054-09-ANNE*
 Document No. *43*

	Długość wykorzystanej masy	Materiał	Gatunek Nr normy półfabrykat (np. rury)	Masa (kg)	Podziałka	format A4 A5 A6						
							Nazwa rysunku	20.10.05	Długość	Data	Nr projektu technicznego	Nr zmiany
								20.10.05				
								20.10.05				
Nazwisko	J.GROCHOŃSKI J.GROCHOŃSKI T.WALDARCZYK	Podpis	J.KLICZEK	Data	Nr projektu technicznego	Nr zmiany						
Projektował	Wykonał	Sprawdził	Zatwierdził	Data	Nr projektu technicznego	Nr zmiany						



 FIRES s.r.o. POŽIARNÁ ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 01.04.2009
	Podpis/Signature 
Dokument č./Document No. FIRES-PR-054-09-ANUE	
Príloha č./Appendix No. 99	

4	šruba	SGN M6x12		4	650442
3	šruba	SGN M8x14		8	650142
2	ťahovník	LDONCH60		2	863000
1	DRABINKA	DGONP400H60		1	863043
Pos.	Benennung	Zeichnung-Nr	Material	Stck.	Katalogs Nr.
	Dĺžka výšky metalizovaný		Materiál far. nátery polifosfát far. nátery	PN-EN 10327:2005	Hmotnosť 7,50
Projektant	Miesto Ján Čechovský	Podpis	Dátum 21. nov. 09	Miesto výskumu	Formát A4
Príloha					Príloha 1
Správa					Príloha 1
Zatvárdza					Príloha 1
Profesionálne Systémy Trás Káblových					



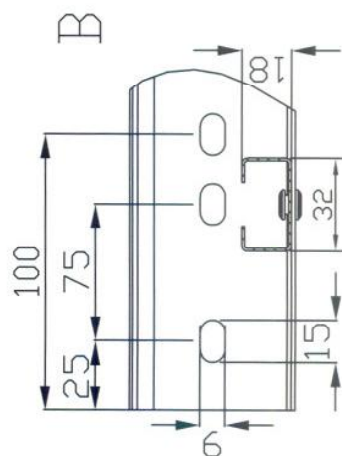
A	Typ	L	Nr. Kat	B
100	DUDP100H60/6N	6000		95
200	DUDP200H60/6N	6000		195
300	DUDP300H60/6N	6000		295
400	DUDP400H60/6N	6000		395
100	DUDP100H60/3N	3000		95
200	DUDP200H60/3N	3000		195
300	DUDP300H60/3N	3000		295
400	DUDP400H60/3N	3000		395

FIRES s.r.o.
POŽIARNA ODOLNOST
FIRE RESISTANCE

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

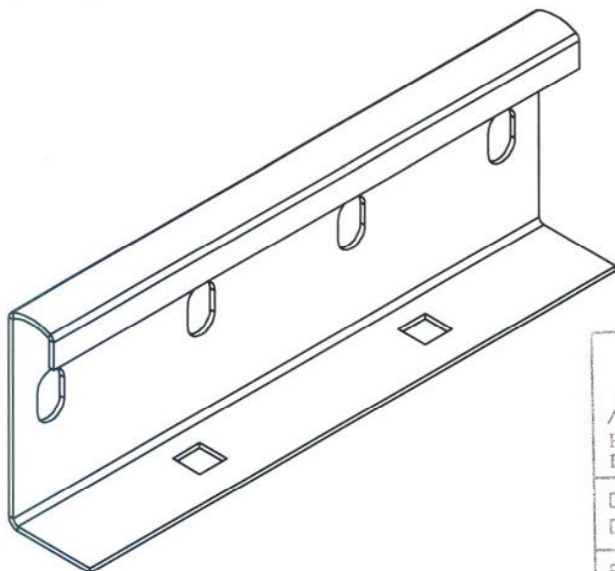
Dátum/Date **02.04.2009**
Podpis/Signature **YaoS**

Príloha č./Appendix No. **45**

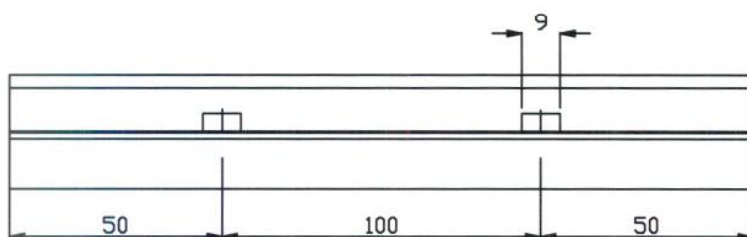
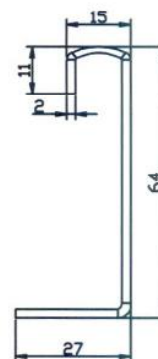
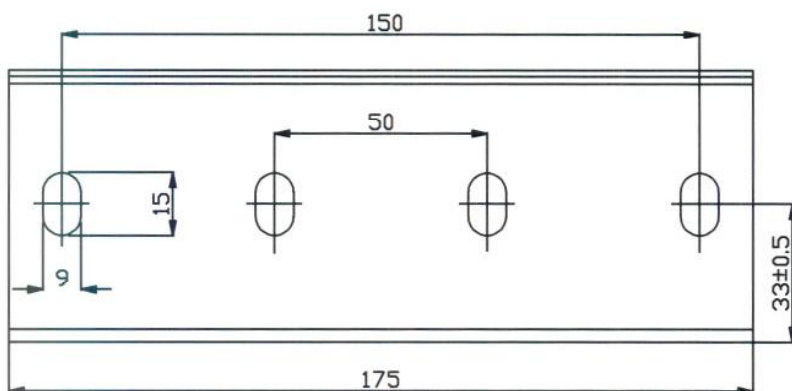


Dachyčka výtlak nie tolerovaný	Gatunek Nr. normy półfabrykat (nr. normy)	Masa kgl.	Podziałka	Format Arkusz
Projektował J.GROCHOWSKI	Material 20.10.05			
Rysował J.GROCHOWSKI	20.10.05			
Sprawdził T.VLADARCIK	20.10.05			
Zatwierdził JKLICZEK	20.10.05			
Nazwa rysunku DUDP400H60/3N				Nr. zmienny
Nr. programu Naszynowego				

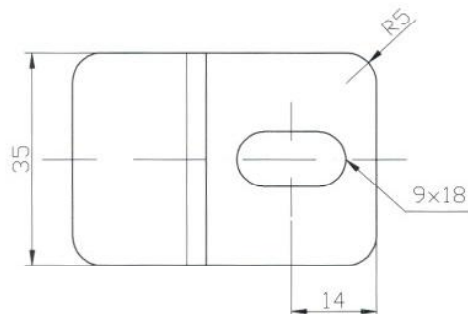
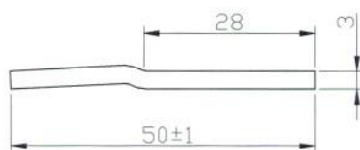
Profesjonalne Systemy Tras Kablowych



 FIRES S.T.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>02.09.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FD-054-09-AMW</i>	
Príloha č./Appendix Nb. <i>56</i>	



 Dimenzje wymiarów nie tolerowanych	Nazwa J.GROCHOWSKI J.Grochowski T.WŁODARCZYK J.KLICZEK		Podpis 	Materiał Gatunek Nr normy półfabrykat (nr normy)	Blach stalocynk. i net.Senzinina PN-EN 10327:2005	Masa (kg) 	Podziałka 	Format A4 Arkusz Arkuszy
Projektował Rysował Sprawdził Zatwierdził	Nazwa rysunku LD0CH60N	Nr rysunku 863000		Nr zrealizacji 				
 Profesjonalne Systemy Tras Kablowych								



FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>01.04.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FR-054-09-ANNE</i>	
Príloha č./Appendix No. <i>42</i>	

	Długość wymiarów nieolerowanych $\pm 0,5$	Materiał Gatunek Nr normy półfabrykat (nr normy)	----- PN-EN 10327:2005 -----	Masa [kg] 0,04	Podziałka 1:1	Format A4 Arkusz -- Arkuszy --
Projektował	Tomasz Grudniewski	Data 29.12.04 20.02.08 20.02.08 20.02.08	Nazwa rysunku ZMO	Nr rysunku 802900		
Rysował	Jakub Rudak					
Sprawdził	Jacek Kliczek					
Zatwierdził	Jacek Kliczek					
Profesjonalne Systemy Tras Kablowych		Nr zmlowy				

D-D

14; 9; 8

11; 12; 13

D

15

11; 12; 13

A

C

A:

B:

C:

15

13

9

8

6

14

13

12

11

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

10

9

8

7

6

5

4

3

2

1

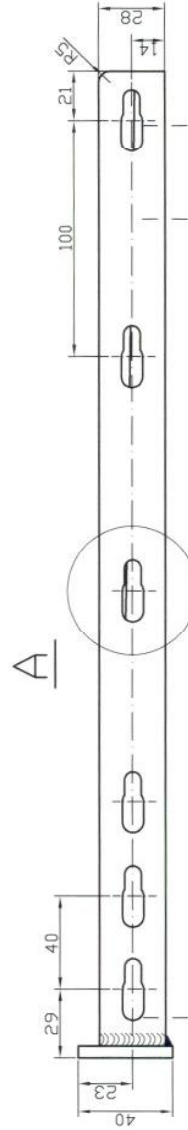
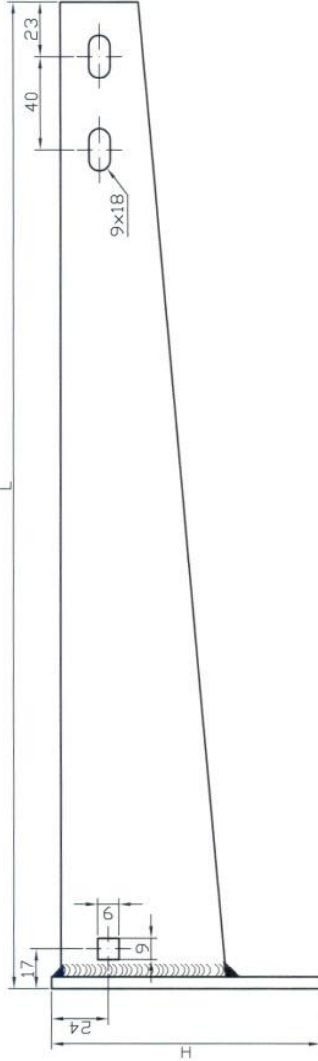
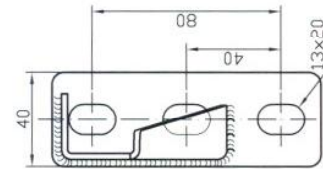
10

9

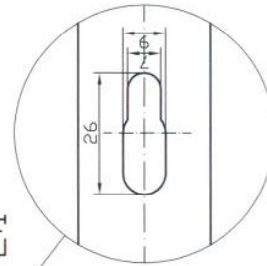
8

7

<i>L</i>	<i>Typ</i>	<i>Nr.kat</i>
200	WPC0200	000200
300	WPC0300	000300
400	WPC0400	000400
500	WPC0500	000500
600	WPC0600	000600
700	WPC0700	000700
800	WPC0800	000800
900	WPC0900	000900
1000	WPC01000	000001

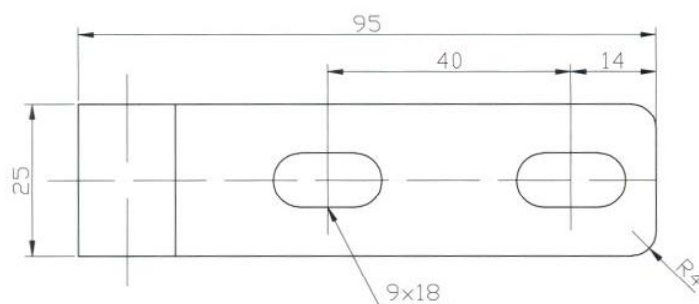


A 2:1



FIRIS S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Datum/Date <i>02.04.2009</i>	Podpis/Signature <i>[Signature]</i>
	Dokument č. <i>FIRIS-FR-055-09. ANE</i> Document No.	
Příloha č./Appendix No. <i>50</i>		

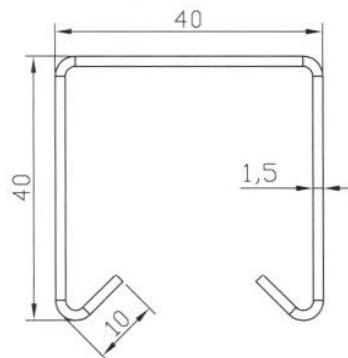
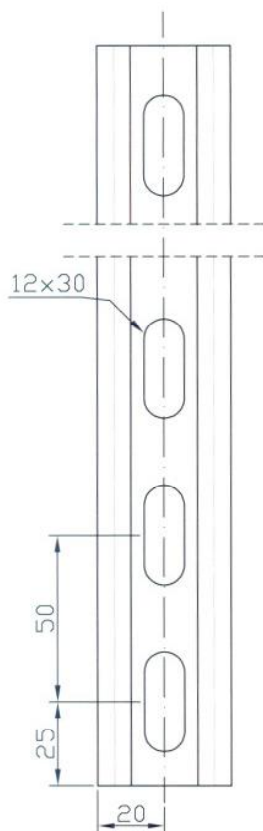
4 Wysięgnik	WMCD 400	800340	114,0	420	0,83
3 Wysięgnik	WMCD 300	800330	114,0	320	0,43
2 Wysięgnik	WMCD 200	800320	85,0	220	0,36
1 Wysięgnik	WMCD 100	800310	85,0	120	0,22
LP Nazwa wyrobu	Symbol	Nr katalogowy	L [mm]	H [mm]	Masa [kg]
±0,5	Getunek	Nr normy	Masa [kg]	Podziałka	Formet A3
	29.12.04	PN-EN 10327/2005	---	1:1	Arkusze ---
Projektant	Tomasz Gwóźdź	Nazwa rysunku	WMCD...		
Opis	Jakub Rudak	20.02.08			
Sprawdził	Jacek Kilczek	20.02.08			
Zatwierdził	Jacek Kilczek	20.02.08			
Profesjonalne Systemy		Nr rysunku	802900		
Tras Kablowych		Nr zmiany			



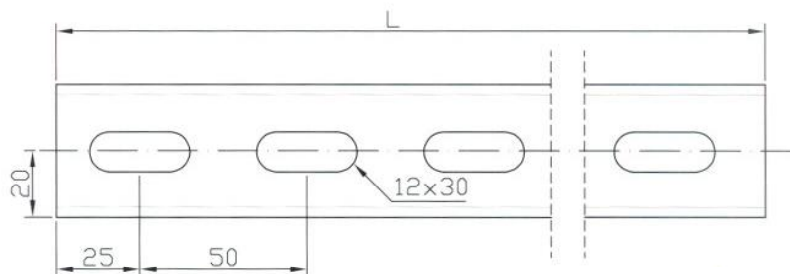
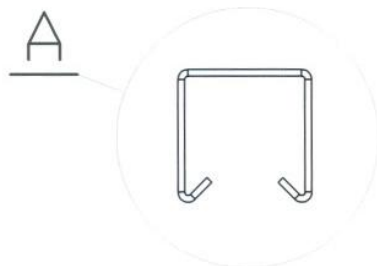
 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>02.09.2009</i>
	Podpis/Signature <i>Jacek S</i>
Dokument č. Document No. <i>FIRES-FR-054-09-AWE</i>	
Příloha č./Appendix No. <i>51</i>	

	Długość wyniarów nieolerowanych $\pm 0,5$	$\pm 0,5$	Gatunek	----	Masa [kg]	Podziałka 1:1	Format	A4		
			Nr normy	PN-EN 10327:2005	---		Arkusz	--		
Projektował	Jacek Grochowski	Podpis _____ _____ _____ _____	Materiał	----	Nazwa rysunku UPW□	Nr zmlony <table border="1" style="width: 100px; height: 40px;"> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> <tr><td> </td></tr> </table>				
Rysował	Jakub Rudak	Data	12.02.04							
Sprawdził	Jacek Kliczek	Data	20.02.08							
Zatwierdził	Jacek Kliczek	Data	20.02.08							
 Profesjonalne Systemy Tras Kablowych			Nr rysunku 803300							

A 1:1



 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date <i>02.04.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FR-054-09-ANNE</i>	
Príloha č./Appendix No. <i>90</i>	



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
LP	Nazwa wyrobu	Symbol	Nr Katalogowy	L [mm]	Masa [kg]

	Oddychatka wymiarów nietolerowanych	Nazwa Jacek Grochowski Jakub Rudak Jacek Kliczek Jacek Kliczek	Podpis _____ _____ _____ _____	Materiał Gatunek Nr normy półfabrykat (nr normy)	PN-EN 10327:2005 -----	Masa [kg] ---	Podziałka 1:2	Format A4 Arkusz -- Arkuszy --
Projektował	Jacek Grochowski	Data 20.10.05 20.02.08 20.02.08 20.02.08	Nazwa rysunku <i>CWOP40H40/...N</i>					
Rysował	Jakub Rudak		Nr rysunku <i>8041.....</i>					
Sprawdził	Jacek Kliczek		Nr zmiany					
Zatwierdził	Jacek Kliczek		Profesjonalne Systemy Tras Kablowych					

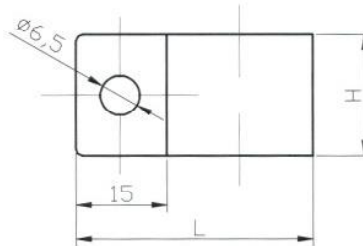
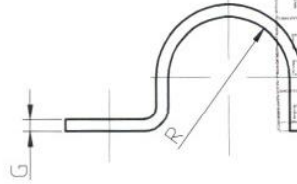


Dátum/Date
22.04.2009

Podpis/Signature

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

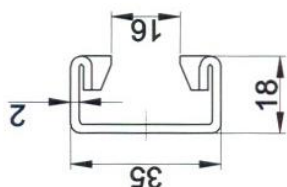
Príloha č./Appendix No. 53



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
LP	Nazwa wyrobu	Symbol	Nr Katalogowy	R [mm]	L [mm]	H [mm]	G [mm]

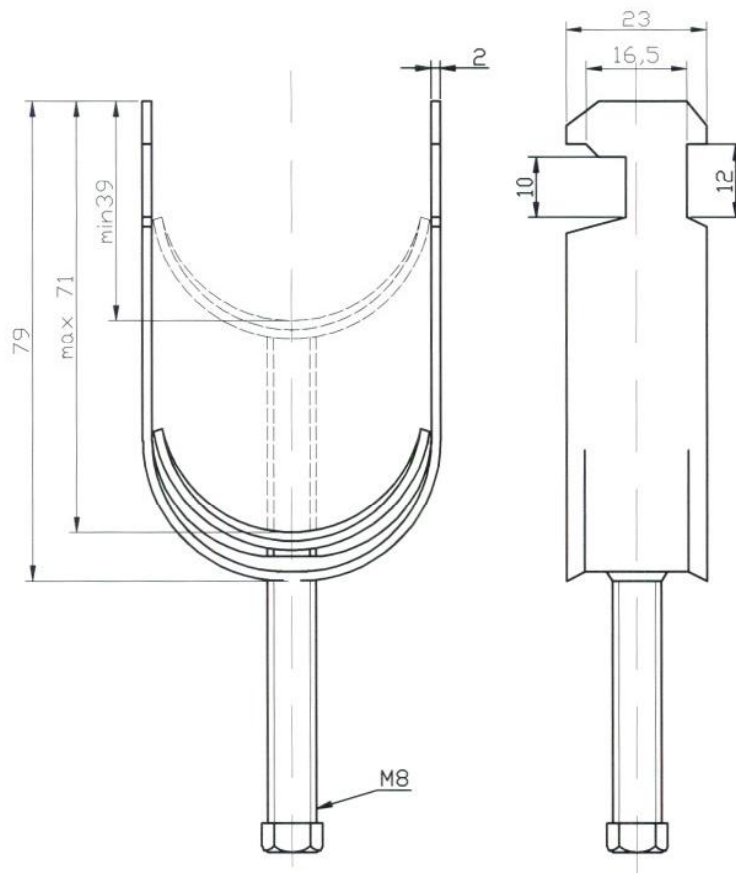
	Długość wymiarów nietolerowanych $\pm 0,5$	Materiał Gatunek Nr normy PN-EN 10327:2005 półfabrykat (nr normy)	Masa [kg] ---	Podziałka 1:1	Format A4 Arkusz --- Arkuszy ---
Projektował Rysował Sprawdził Zatwierdził	Jacek Grochowski Jakub Rudak Jacek Kluczek Jacek Kluczek	Data 20.10.05 20.02.08 20.02.08 20.02.08	Nazwa rysunku UDF 5-43		
Profesjonalne Systemy Tras Kablowych			Nr rysunku 4055.....		



[illegible]

This drawing and its contents is the property of the BANC company and copied or otherwise disclosed to any third party without our consent.

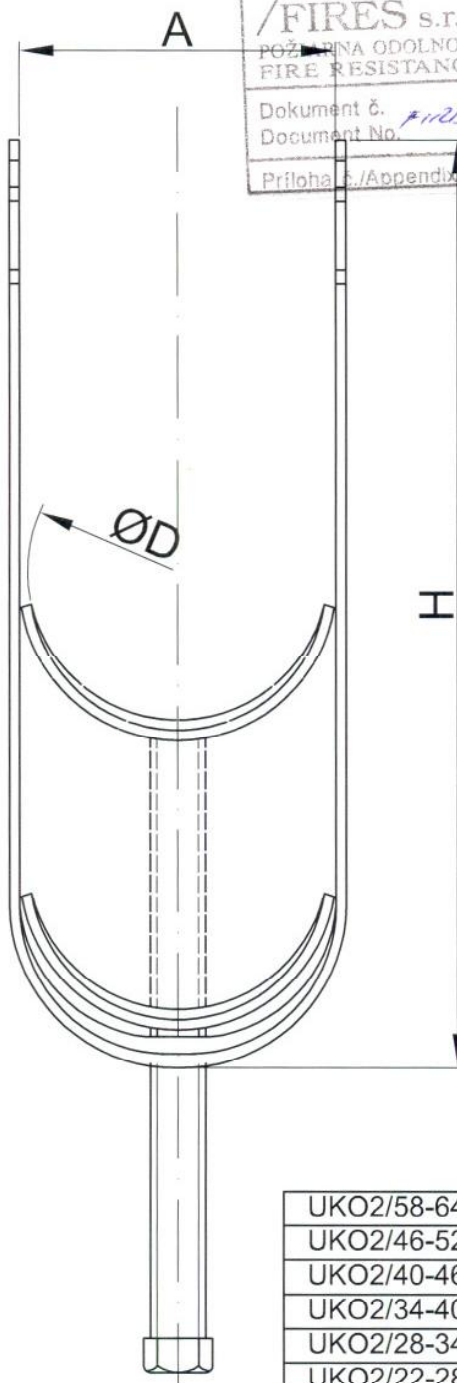
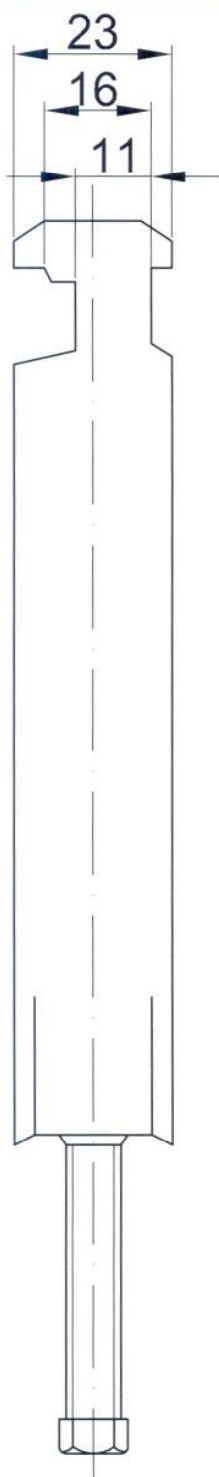
 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 02.04.2009
	Podpis/Signature 
Dokument č. / Document No. FIRES FR-054-09-AVE	
Príloha č./Appendix No. 56	



	Odchylka (výmiarů) netolerovaných		Materiál Gatunek Nr normy półfabrykat (nr normy)		Masa (kg) -----	Podziałka 1:1	Format A4 Arkusz 1 Arkuszy 1
	Projektował T.Grudniewski	Rysował J.Josiński	Sprawdził JKliczek	Zatwierdził JKliczek	Data 2004.12.29 2004.12.29 2004.12.29 2004.12.29	Nazwa rysunku UKD1/38-40E	
Nr programu maszynowego -----					Nr zmienny -----		
Nr rysunku -----					-----		

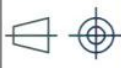


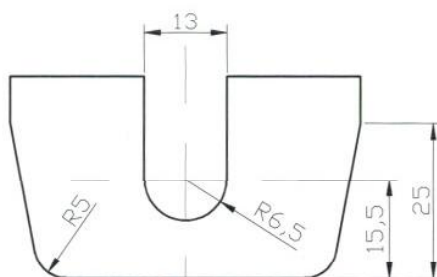
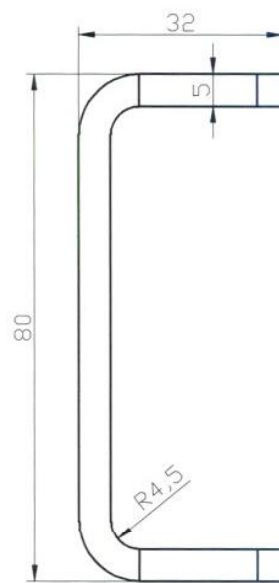
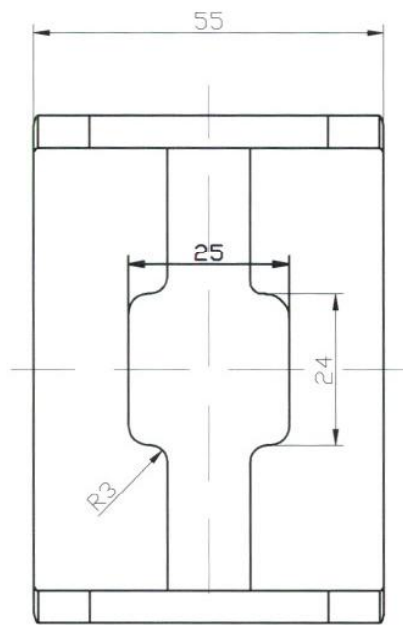
**Profesjonalne Systemy
Tras Kablowych**



 POŻARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 04.04.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. <i>FIRES-FR-058-09-AWIE</i> Document No.	
Príloha č./Appendix No. <i>58</i>	

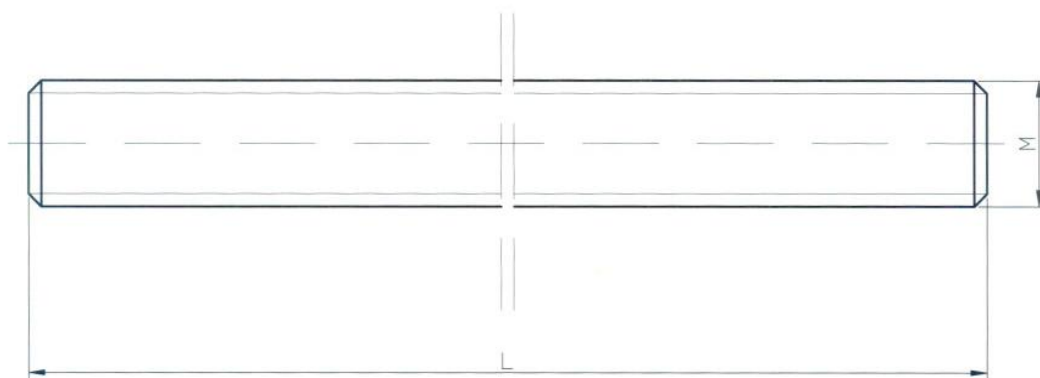
UKO2/58-64	66	163	64
UKO2/46-52	54	149	52
UKO2/40-46	48	132	46
UKO2/34-40	42	118	40
UKO2/28-34	36	105	34
UKO2/22-28	30	90	28
UKO2/16-22	24	80	22
SYMBOL	A	H	ØD

	Długość wymiarów nietolerowanych		Materiał	Gatunek	Masa [kg]	Podziałka	Format									
				Nr normy												
				półfabrykat (nr normy)	----	1:1	A4									
Projektował	Nazwisko G. Matuszewski	Podpis	Data 2009.06.08	Nazwa rysunku UKO2/... - ...												
Rysował				Nr programu maszynowego												
Sprawił				---												
Zatwierdził				Nr rysunku												
 Profesjonalne Systemy Tras Kablowych				<table border="1"> <tr> <td>Nr zmiany</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>				Nr zmiany								
Nr zmiany																



 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 04.09.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. FIRES-FR-054-09-AWE	
Príloha č./Appendix No. 58	

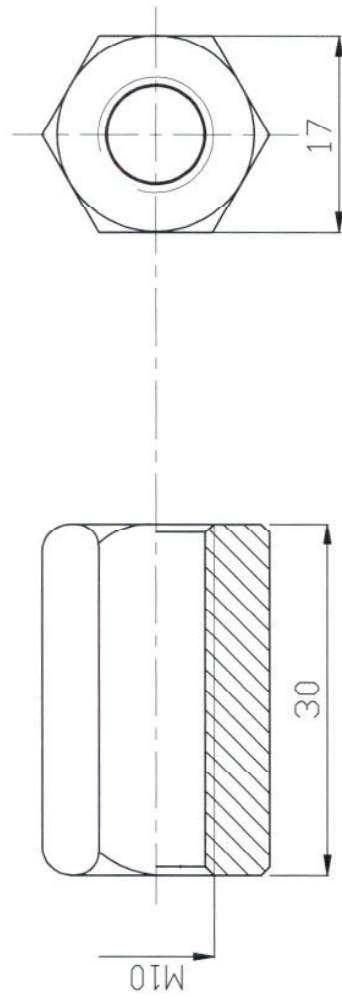
		Odchylka wymiarów niez tolerowanych	Grubość [mm] 5	Materiał Gatunek Nr normy półfabrykat (nr normy)	Blacha stal. cynk. met. zanurz. PN-EN ISO 1461:2000	Masa [kg] 0,21	Podziałka 1:1	Format A4 Arkusz Arkuszy
Projektował	Nazwisko J.GROCHOWSKI J.Grochowski T.WŁODARCZYK J.KLICZEK	Podpis 	Data 20.10.05 20.10.05 20.10.05 20.10.05	Nazwa rysunku USDV				
Rysował								
Sprawił								
Zatwierdził								
				Profesjonalne Systemy Tras Kablowych		Nr rysunku 803700		
						Nr zmiany		

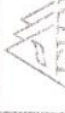


	Dátum/Date <i>02.09.2009</i>	
	Podpis/Signature <i>[Signature]</i>	
	Dokument č. Document No. <i>FIRES-FR-05-8-03-AWE</i>	
	Príloha č./Appendix No. <i>59</i>	

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

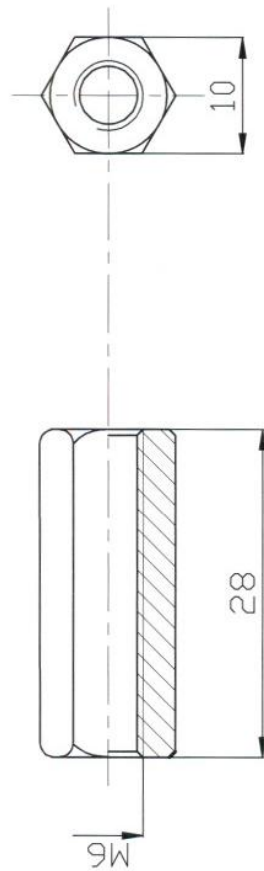
	Odczytka wymiarów niez tolerowanych	Grubość (mm) -	Materiał Gatunek Nr normy	Stal cynkowana galwanicznie	Masa (kg)	Podziałka 2:1	Format A4
							Arkusze
Projektował	J.GROCHOWSKI	Podpis	20.10.05	Nazwa rysunku <i>PGM..../1</i>			Nr zmiany
Rysował	J.Grochowski		20.10.05				
Sprawił	T.WŁODARCZYK		20.10.05				
Zatwierdził	J.KLICZEK		20.10.05				
			Profesjonalne Systemy Tras Kablowych				



 FIDES S.r.l. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Datum/Date 20.04.2024
	Podpis/Signature <i>[Signature]</i>
Dokument č. FIDES-FR-054-09-AWE	
Document No.	
Priloha č./Appendix No. 60	

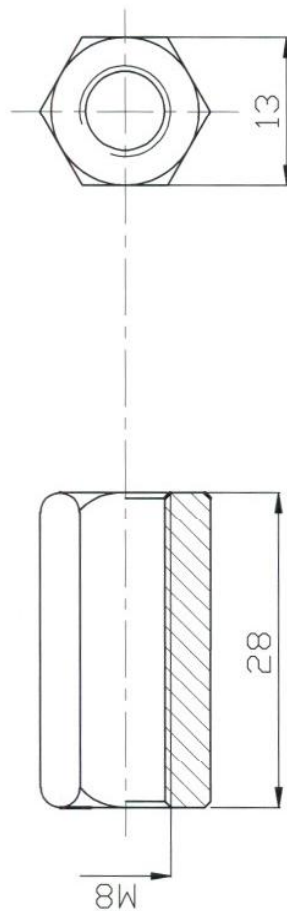
Nr części	NP10.30		11SMnZ8Pb30	Nr rysunku lub normy
Konstruktor	Nazwa części		Materiał	Wymiary
Sprawdził				
Zatwierdził				
Kreślił				
	Nazwisko	Podpis	Data	
Podz. 2:1	Nazwa wyrobu		Nakrećka przedłużana M10	
Szt/kpl	Nr rys.			Arkusz
				Arkuszy

DROMET



 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date <i>02.04.2009</i>
	Podpis/Signature <i>[Signature]</i>
	Dokument č. <i>FIDES - FR - 054-09-ME</i>
	Príloha č./Appendix No. <i>61</i>

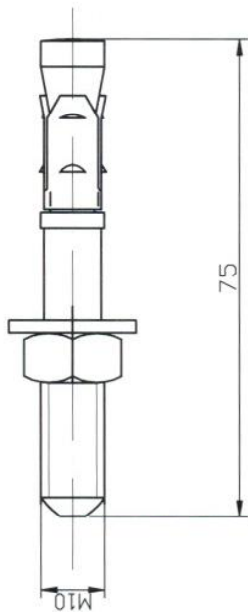
NP.6.28		11SMnZ8Pb30	DROMET
Nr części	Nazwa części	Materiał	
Konstruktor		Wymiary	
Sprawdził			
Zatwierdził			
Kreślił			
	Nazwisko	Podpis	Data
Podz. 2:1	Nazwa wyrobu		Nakrętka przedłużana M6
Szt./kpl	Nr rys.	Arkusz	



 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 21.04.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRE-S-FR-05.1-09-MW</i>	
Príloha č./Appendix No. <i>68</i>	

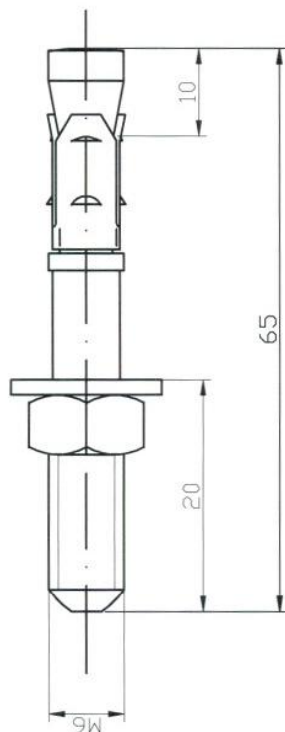
Nr części	NP.8.28	11SMnZ8Pb30	Nr rysunku lub normy
Konstruktor	Nazwa części	Materiał	Wymiary
Sprawdził			
Zatwierdził			
Kreślił			
Nazwisko	Podpis	Data	
Podz. 2:1	Nazwa wyrobu	Nakretnka przedłużana M8	Arkusz
Szt/kpl	Nr rys.		Arkuszy

DROMET



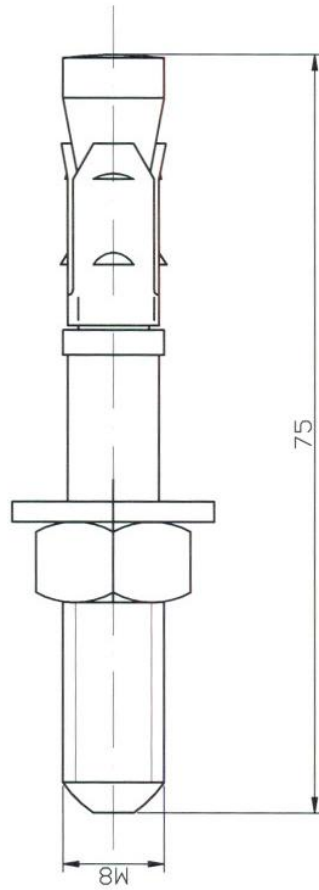
 FIRES S.T.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 01.04.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. <i>FIRES-FR-054-09-AWE</i> Document No.	
Příloha č./Appendix N ^o . <i>63</i>	

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



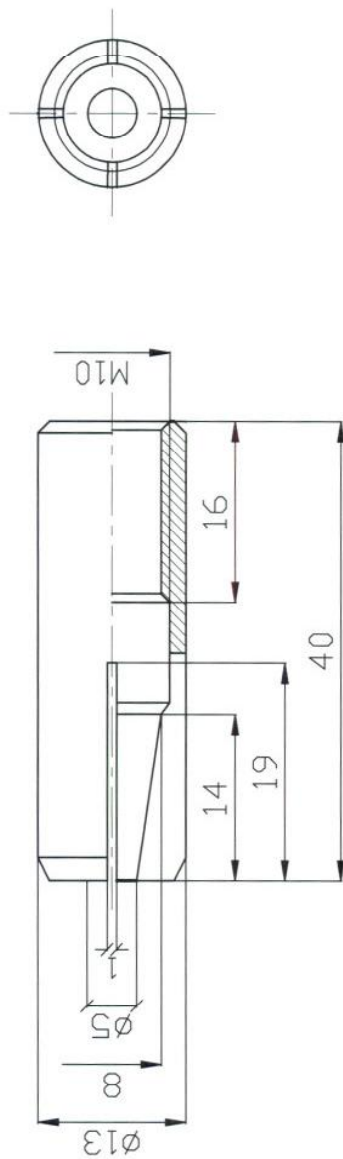
 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 21.04.2009
	Podpis/Signature 
Dokument č. FIDES-FR-054-09-ANW Document No.	
Príloha č./Appendix No. 69	

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



	Datum/Date 21.04.2023
	Podpis/Signature
Dokument č. FIRMES-FR-054-09-AWE	
Document No.	
Priloha č./Appendix No. 65	

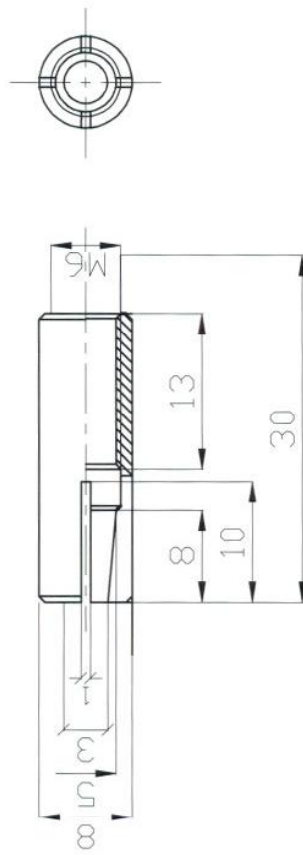
PSRn.8.75		S235JR	Wymiary	Nr rysunku lub normy
Nr części	Nazwa części	Materiat	DROMET	
Konstruktor				
Sprawdzit				
Zatwierdzt				
Krešit				
	Nazwisko	Podpis	Data	
Podz.	Nazwa wyrobu Łącznik rozporowy PSRn MBx75			Arkusze
Szt/kpl	Nr rys.			Arkuszy



 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 02.04.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. FIRES-FR-054-02. AVE	
Document No. 66	

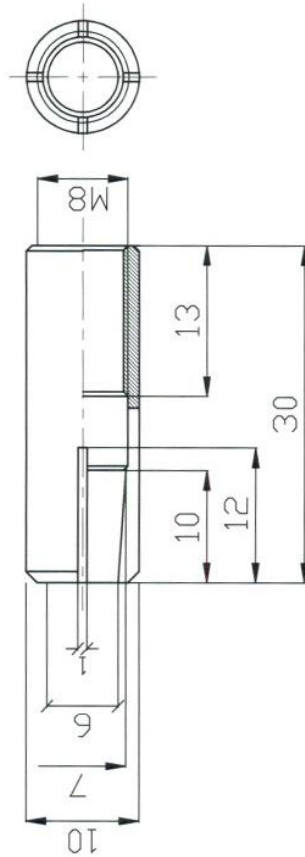
Nr części	TRSI0.40	S235JR	Nr rysunku lub normy
Konstruktor	Nazwa części	Materiał	Wymiary
Sprawdził			
Zatwierdził			
Kreślił			
	Nazwisko	Podpis	Data
Podz. 2:1	Nazwa wyrobu Tuleja rozprężna stalowa M10x40		
Szt/kpl	Nr rys.		
	Arkusz		

DROMET



	Dátum/Date	02.04.2009
	Podpis/Signature	
	Dokument č. <i>FIRES-FR-054-09-MWE</i> Document No. <i>63</i> Príloha č./Appendix No.	

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



 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 02.09.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. <i>FIRES-FR-054-09-ANK</i>	
Príloha č./Appendix No. <i>68</i>	

TRS.B.30		S235JR	Nr rysunku lub normy
Nr części	Nazwa części	Materiał	Wymiary
Konstruktor			
Sprawdzit			
Zatwierdził			
Kreślił			
		Nazwisko	Podpis
		Data	
Podz. 2:1		Tuleja rozprężna stalowa MBx30	
Szt./kpl		Nr rys.	
		Arkusz	
		Arkuszy	

DROMET