

TEST REPORT FIRES-FR-004-09-AUNE

Cable bearing system BAKS with TECHNOKABEL cables



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, e-mail: info@fires.sk, 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-004-09-AUNE**

Tested property: Function in fire

Test method: DIN 4102 – 12:1998-11

Date of issue: **25. 02. 2009**

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

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 cablesSponsor: **BAKS Kazimierz Sielski**, ul. Jagodne 5, 05-480 Karczew, Poland

Task No.: PR-08-0528

Specimen received: 09. 01. 2009

Date of the fire test: 16. 01. 2009

Technician responsible for the technical side of this report: Miroslav Hudák

Number of pages: 8

Number of appendices: 78

Test reports: 5

Copy No.: 3

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: **BAKS Kazimierz Sielski**, ul. Jagodne 5, 05-480 Karczew, PolandCopy No.5: **TECHNOKABEL S.A.**, Nasielska 55, 04-343 Warszawa, 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. Persons witnessing the test:

Representatives of the sponsor: Mr. Kliczek (BAKS)
 Mr. Matysiak (BAKS)
 Mr. Kwiatkowski (TECHNOKABEL)
 Mr. Gosik (TECHNOKABEL)

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

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 and TECHNOKABEL.

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, KSA, UKO1, sleeves – OZO and power and communication non-halogen cables business TECHNOKABEL S. A..

Cables:	NHXH 4x1,5 RE FE180 PH30/E30	(4 x)
	NHXH 4x50 RM FE180 PH30/E30	(4 x)
	NHXCH 4x1,5/1,5 RE FE180 PH30/E30	(4 x)
	NHXCH 4x50/25 RM FE180 PH30/E30	(4 x)
	NHXH 4x1,5 RE FE180 PH90/E90	(18 x)
	NHXH 4x16 RM FE180 PH90/E90	(2 x)
	NHXH 4x50 RM FE180 PH90/E90	(16 x)
	NHXCH 4x1,5/1,5 RE FE180 PH90/E90	(10 x)
	NHXCH 4x16/16 RM FE180 PH90/E90	(2 x)
	NHXCH 4x50/25 RM FE180 PH90/E90	(10 x)
	HTKSH 1x2x0,8 FE180 PH90/E30-E90	(20 x)
	HTKShekw 1x2x0,8 FE180 PH90/E30-E90	(16 x)
	HDGszo 3x2,5 FE180 PH90/E30-E90	(16 x)
	HDGsekwzo 3x2,5 FE180 PH90/E30-E90	(16 x)

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

Ceiling installation: was made by cable clips (type UDF, UEF, KSA), sleeves (type OZO) and ceiling ledges (type SDOC 400) which were fixed to ceiling by dowels (type SRO M6x30, GSO 6x40 and KWBO 6x40) in spacing of 300 mm and 600 mm. Cables were fixed to ledges by clips (type UKO1) in spacing of 600 mm. Cable clips (type UDF and UEF) were fixed in plastic ledge (producer Emitec) to ceiling by dowels (type SRO M6x30) in spacing of 300 mm. Cable clips were depending on the diameter of cables.

Suspension track No. 1: was made by three pair hangers (type UTMO) which were fixed to wall by dowels (type PSRO M8x75) in spacing of 1500 mm.

Ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14) and fixed to hangers by screws M8 (type SGN M8x14). Cables were fixed to ladders by clips (type UKO1) in spacing of 600 mm.

Suspension track No. 2: was made of three consoles combined of two horizontal supports (type CWOP40H40/05E rustless) and two threaded bar (type PGM10/1x800E rustless) with washers and nuts M10 and two hangers (type WPOVE rustless) which were fixed to ceiling by dowels (type PSRO M10x80E rustless) in spacing of 1500 mm.

Trays (type KCOJ 400H60/3E rustless, steel sheet thickness 1,0 mm) were fixed at upper horizontal supports and jointed together by two junctions (type LPOPH60E) and by sheet (type BLO 400E) with screws M6 (type SGN M6x12/E). Trays were fixed to supports by screws M6 (type SGN M6x12/E).

Ladders (type DGOD 400H60/3E rustless, steel sheet thickness 1,2 mm, spacing of transoms 150 mm) were fixed at under horizontal supports and jointed together by junction (type LDOCH60E) with screws M8 (type SGN M8x14/E). Ladders were fixed to supports by clips (type ZMOE) with screws M8 (type SGN M8x14/E). Cables were fixed to trays by clips UDF and ladders by clips UKO1.

Suspension track No. 3: was made by three pair booms (type WMCO 300) which were fixed to ceiling by two dowels (type PSRO M10x80) in spacing of 1500 mm. Two hangers (type UTMO) were fixed by screws (type SGN M8x14) at each boom.

Ladders (type DUOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 300 mm) were jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14) and fixed at upper holders with screws M8 (type SGN M8x14).

Ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14) and fixed at under holders with screws M8 (type SGN M8x14). Cables were fixed to 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 PSRO M10x80) in spacing of 1500 mm. Two booms (type WWSO 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 M10 with washers and nuts M10 to ceiling holder (type USOV) which was fixed to ceiling by dowel (type PSRO M10x80).

Trays (type KCOD 400H60/3N, steel sheet thickness 1,2 mm) were fixed at upper booms and jointed together by two junctions (type LPOPH60N) and by sheet (type BLO400N) with screws M6 (type SGN M6x12). Trays were fixed to booms by screws M6 (type SGN M6x12).

Ladders (type DUOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 300 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.

Suspension track No. 5: was made by three hangers (type WFLO 500) which were fixed to ceiling by two dowels (type PSRO M10x80) in spacing of 1500 mm. Three hangers (type WFLO 400) were fixed by screws (type SM M10x20) at each hanger. Ends of hangers were fixed by threaded bar M10 with washers and nuts M10 to ceiling by dowel (type TRSO M10).

Trays (type KCOD 400H60/3N, steel sheet thickness 1,2 mm) were fixed at upper hangers and jointed together by two junctions (type LPOPH60N) and by sheet (type BLO400N) with screws M6 (type SGN M6x12). Trays were fixed to hangers by screws M6 (type SGN M6x12).

Ladders (type DUOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 300 mm) were fixed at central hangers and jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14). Ladders were fixed to hangers by clips (type ZMO) with screws M8 (type SGN M8x14).

Trays (type KCOD 400H60/3N, steel sheet thickness 1,2 mm) were fixed at under hangers and jointed together by two junctions (type LPOPH60N) and by sheet (type BLO400N) with screws M6 (type SGN M6x12). Trays were fixed to hangers by screws M6 (type SGN M6x12). Cables were fixed to trays by clips UDF and ladders by clips UKO1.

Suspension track No. 6: was made by three pair hangers (type UTMO) which were fixed to wall by dowels (type PSRO M8x75) in spacing of 1500 mm.

Ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14) and fixed to hangers by screws M8 (type SGN M8x14). Cables were fixed to ladders by clips (type UKO1) in spacing of 600 mm.

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

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
50,7	3,8	22,7	0,8

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]
16. 01. 2009	48,2	13,4

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: cables NHXCH 4x50/25 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 2: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 3: cables NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 4: cables NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 5: cable NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 6: cable NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 7: cable NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 8: cable NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 9: cable NHXCH 4x50/25 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 10: cable NHXCH 4x50/25 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 11: cable NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 12: cable NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 13: cable NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 14: cable NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 15: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 16: cables NHXCH 4x50/25 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 17: cables NHXCH 4x1,5/1,5 RE FE180 PH30/E30	90 minutes no failure/interruption
Specimen 18: cables NHXH 4x1,5 RE FE180 PH30/E30	23 minutes
Specimen 19: cables NHXCH 4x50/25 RM FE180 PH30/E30	71 minutes
Specimen 20: cables NHXH 4x50 RM FE180 PH30/E30	18 minutes
Specimen 21: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 22: cables NHXCH 4x50/25 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 23: cables NHXH 4x50 RM FE180 PH30/E30	59 minutes
Specimen 24: cable NHXCH 4x50/25 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 25: cable NHXCH 4x50/25 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 26: cable NHXCH 4x1,5/1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 27: cable NHXCH 4x1,5/1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 28: cables NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 29: cables NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 30: cables NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 31: cables NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 32: cables NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 33: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 34: cables NHXCH 4x16/16 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 35: cables NHXH 4x16 RM FE180 PH90/E90	80 minutes
Specimen 36: cables (N)HXH 1x50 RM FE180 PH90/E90	28 minutes
Specimen 37: cables NHXH 4x1,5 RE FE180 PH30/E30	90 minutes no failure/interruption
Specimen 38: cables NHXCH 4x50/25 RM FE180 PH30/E30	81 minutes
Specimen 39: cables NHXCH 4x1,5/1,5 RE FE180 PH30/E30	90 minutes no failure/interruption
Specimen 40: cable NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 41: cable NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 42: cable NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 43: cable NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 44: cable NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 45: cable NHXH 4x50 RM FE180 PH90/E90	90 minutes no failure/interruption
Specimen 46: cable NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 47: cable NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 48: cables NHXH 4x50 RM FE180 PH90/E90	65 minutes
Specimen 49: cables NHXH 4x1,5 RE FE180 PH90/E90	90 minutes no failure/interruption
Specimen 50: cables (N)HXH 1x50 RM FE180 PH90/E90	57 minutes
Specimen 51: cables (N)HXH 1x50 RM FE180 PH90/E90	90 minutes no failure/interruption

SPECIMENS	Time to first failure/interruption of conductor
Specimen 52A: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 52B: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 53A: cable HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 53B: cable HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 54A: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 54B: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 55A: cable HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 55B: cable HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 56A: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 56B: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 57A: cable HDGsekwz0 3x2,5 FE180 PH90/E30-E90	24 minutes
Specimen 57B: cable HDGsekwz0 3x2,5 FE180 PH90/E30-E90	36 minutes
Specimen 58A: cable HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 58B: cable HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 59A: cable HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 59B: cable HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 60A: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 60B: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 61A: cables HDGsekwz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 61B: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 62A: cables HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 62B: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 63A: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 63B: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 64A: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 64B: cables HDGsekwz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 65A: cable HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 65B: cable HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 66A: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 66B: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
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 HDGsekwz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 68B: cable HDGsekwz0 3x2,5 FE180 PH90/E30-E90	47 minutes
Specimen 69A: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 69B: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 70A: cable HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 70B: cable HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 71A: cables HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 71B: cables HDGsekwz0 3x2,5 FE180 PH90/E30-E90	49 minutes
Specimen 72A: cables HDGsekwz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 72B: cables HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 73A: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 73B: cables HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 74A: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 74B: cable HTKSH 1x2x0,8 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 75A: cable HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption
Specimen 75B: cable HDGsz0 3x2,5 FE180 PH90/E30-E90	90 minutes no failure/interruption

The fire test was discontinued in 96th minute at the request of sponsor.

Specimens S1 – S51 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Specimens S52 – S75 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.

6. CLOSING

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

Report checked by: Ing. Štefan Rástocký

Issued by:

Responsible for the technical side of this report:


 Ing. Štefan Rástocký
 leader of the testing laboratory


 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 S33
Appendix 7	Measured times of tested specimens from S34 to S42
Appendix 8	Measured times of tested specimens from S43 to S49
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 S75
Appendix 12 - 13	Layout of cables in the test furnace
Appendix 14 - 15	Photos taken before and after the fire test
Appendix 16 - 78	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	50,9	16,7	15,8	20,3	16,8	12,8	16,9	29,6	22,5	20,0	14,4	0,0	7,7
5	523,5	559,1	585,8	537,4	504,0	542,3	565,0	543,7	545,1	576,2	14,2	-10,2	11,1
10	713,1	686,3	669,7	610,8	739,4	721,8	679,4	638,7	682,4	678,4	13,7	-4,7	14,2
15	745,0	742,2	721,0	644,4	801,9	779,8	716,2	698,4	731,1	738,5	12,9	-3,4	15,5
20	750,9	780,6	776,5	703,7	870,3	860,2	828,5	816,4	798,4	781,4	12,9	-2,8	16,4
25	780,8	821,0	803,9	767,7	900,9	893,8	853,6	849,5	833,9	814,6	13,0	-1,7	16,7
30	813,5	869,3	869,8	833,1	859,7	865,0	830,4	793,8	841,8	841,8	12,8	-1,2	14,7
35	815,7	846,4	843,4	784,7	921,1	912,0	875,4	856,0	856,8	864,8	12,6	-1,1	15,8
40	829,1	872,6	876,3	826,2	920,2	918,0	884,3	875,5	875,3	884,7	12,6	-1,0	16,3
45	864,8	909,8	908,5	870,9	894,2	891,1	878,1	850,7	883,5	902,3	12,7	-1,1	16,5
50	832,2	877,2	891,4	900,1	866,3	880,8	924,5	937,3	888,7	918,1	12,9	-1,3	15,4
55	842,7	891,3	915,4	917,2	873,2	891,2	914,1	917,8	895,4	932,3	12,9	-1,5	15,5
60	874,3	929,9	948,8	942,3	906,1	933,4	948,9	953,6	929,7	945,3	12,9	-1,5	15,7
65	898,4	950,6	960,2	946,7	939,6	960,8	957,0	953,9	945,9	957,3	12,7	-1,5	16,4
70	911,7	964,9	972,9	961,9	966,7	989,5	980,3	957,5	963,2	968,4	12,9	-1,4	14,6
75	918,9	969,8	981,2	974,6	959,9	979,7	986,1	984,2	969,3	978,7	12,9	-1,4	13,1
80	929,2	979,9	989,9	984,5	976,2	992,2	994,0	977,0	977,9	988,4	12,7	-1,3	13,1
85	944,9	994,0	1002,0	1002,0	990,0	1005,0	1008,0	986,8	991,9	997,4	12,7	-1,3	11,4
90	956,5	1003,0	1011,0	1009,0	1001,0	1018,0	1016,0	996,6	1001,8	1005,9	12,8	-1,2	11,6
91	957,0	1002,0	1008,0	1004,0	1001,0	1017,0	1015,0	995,5	1000,1	1007,6	12,7	-1,2	11,2
92	955,5	1001,0	1010,0	1008,0	998,2	1013,0	1013,0	997,6	999,8	1009,2	12,9	-1,2	11,1
93	942,1	996,5	994,8	1001,0	983,4	998,4	998,6	992,8	988,6	1010,8	13,0	-1,2	11,1

Tave Average temperature in the test furnace calculated from plate thermometers

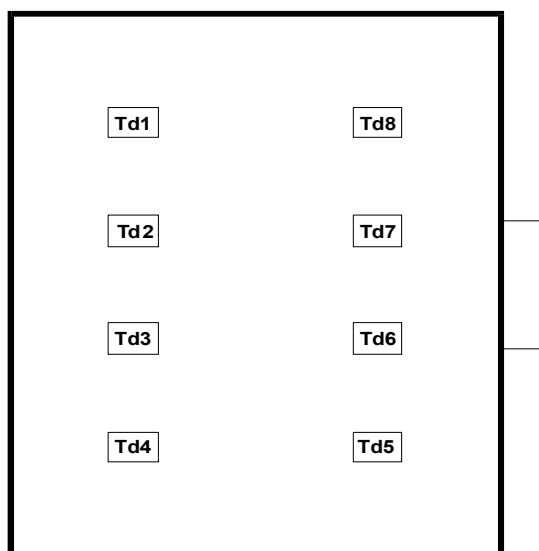
Tn Standard temperature in the test furnace laid down to test guideline

To Ambient temperature

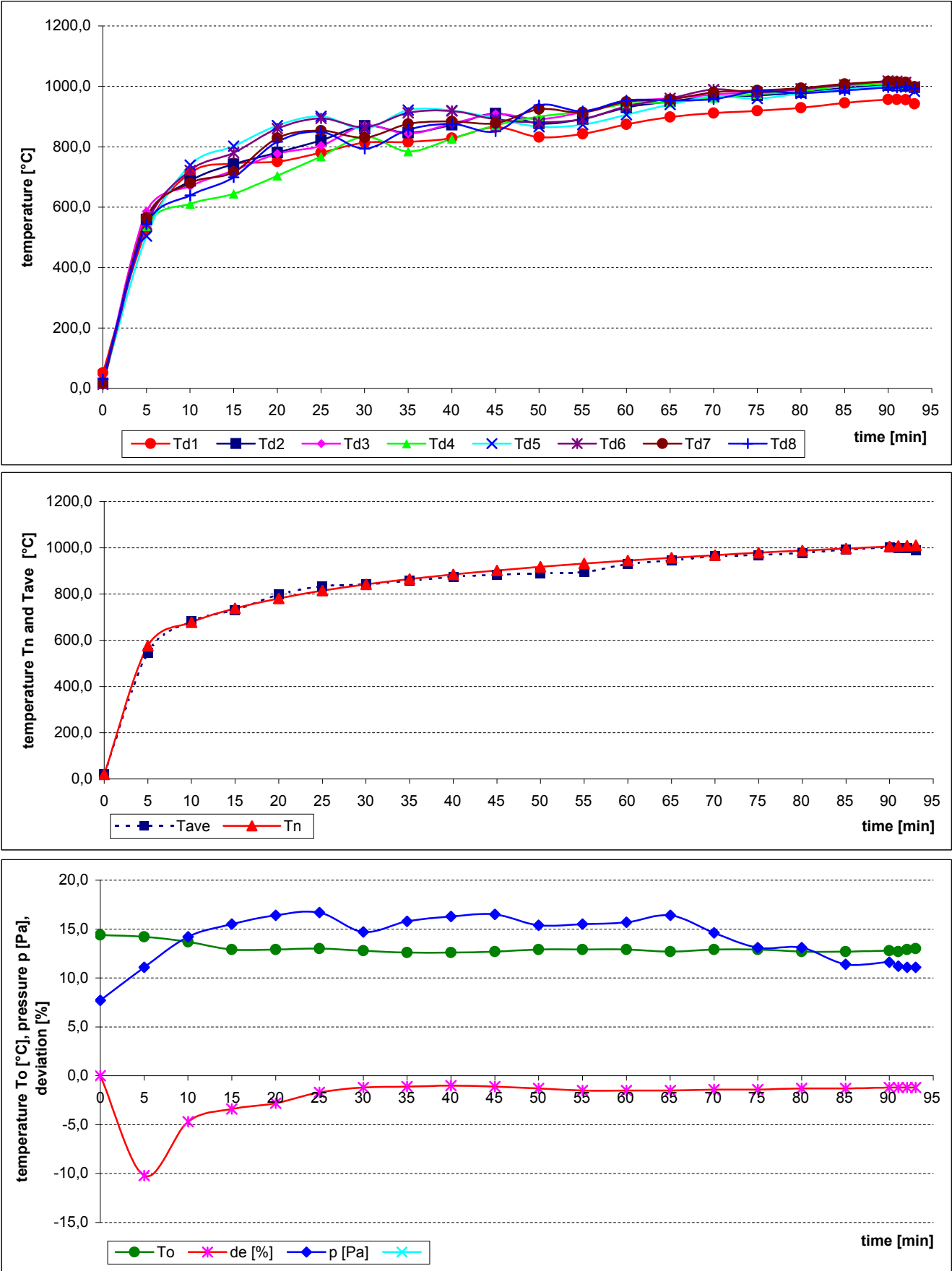
d_e Deviation of the average temperature from the standard temperature calculated according to test guideline

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

Specimen 1: cables NHXCH 4x50/25 RM FE180 PH90/E90
Specimen 2: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimen 3: cables NHXH 4x50 RM FE180 PH90/E90
Specimen 4: cables NHXH 4x1,5 RE FE180 PH90/E90
Specimen 5: cable NHXH 4x1,5 RE FE180 PH90/E90
Specimen 6: cable NHXH 4x1,5 RE FE180 PH90/E90
Specimen 7: cable NHXH 4x50 RM FE180 PH90/E90
Specimen 8: cable NHXH 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 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: cable NHXCH 4x50/25 RM FE180 PH90/E90
Specimen 10: cable NHXCH 4x50/25 RM FE180 PH90/E90
Specimen 11: cable NHXH 4x50 RM FE180 PH90/E90
Specimen 12: cable NHXH 4x50 RM FE180 PH90/E90
Specimen 13: cable NHXH 4x1,5 RE FE180 PH90/E90
Specimen 14: cable NHXH 4x1,5 RE FE180 PH90/E90
Specimen 15: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimen 16: cables NHXCH 4x50/25 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 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	x
	70-L2	x
	71-L3	23:12
	72-PEN	x
S19	73-L1	71:09
	74-L2	x
	75-L3	x
	76-PEN	x
S20	77-L1	x
	78-L2	x
	79-L3	18:49
	80-PEN	x
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	x
	90-L2	x
	91-L3	59:30
	92-PEN	x
S24	93-L1	no failure / interruption
	94-L2	no failure / interruption
	95-L3	no failure / interruption
	96-PEN	no failure / interruption

Specimen 17: cables NHXCH 4x1,5/1,5 RE FE180 PH30/E30
Specimen 18: cables NHXH 4x1,5 RE FE180 PH30/E30
Specimen 19: cables NHXCH 4x50/25 RM FE180 PH30/E30
Specimen 20: cables NHXH 4x50 RM FE180 PH30/E30
Specimen 21: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimen 22: cables NHXCH 4x50/25 RM FE180 PH90/E90
Specimen 23: cables NHXH 4x50 RM FE180 PH30/E30
Specimen 24: cable NHXCH 4x50/25 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 S25 to S33

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	no failure / interruption
	110-L2	no failure / interruption
	111-L3	no failure / interruption
	112-PEN	no failure / interruption
S29	113-L1	no failure / interruption
	114-L2	no failure / interruption
	115-L3	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	no failure / interruption
	122-L2	no failure / interruption
	123-L3	no failure / interruption
	124-PEN	no failure / interruption
S32	125-L1	no failure / interruption
	126-L2	no failure / interruption
	127-L3	no failure / interruption
	128-PEN	no failure / interruption
S33	129-L1	no failure / interruption
	130-L2	no failure / interruption
	131-L3	no failure / interruption
	132-PEN	no failure / interruption

Specimen 25: cable NHXCH 4x50/25 RM FE180 PH90/E90
Specimen 26: cable NHXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimen 27: cable NHXCH 4x1,5/1,5 RE FE180 PH90/E90
Specimen 28: cables NHXH 4x50 RM FE180 PH90/E90
Specimen 29: cables NHXH 4x1,5 RE FE180 PH90/E90
Specimen 30: cables NHXH 4x1,5 RE FE180 PH90/E90
Specimen 31: cables NHXH 4x50 RM FE180 PH90/E90
Specimen 32: cables NHXH 4x1,5 RE FE180 PH90/E90
Specimen 33: cables NHXCH 4x1,5/1,5 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 S34 to S42

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S34	133-L1	no failure / interruption
	134-L2	no failure / interruption
	135-L3	no failure / interruption
	136-PEN	no failure / interruption
S35	137-L1	x
	138-L2	80:38
	139-L3	80:38
	140-PEN	x
S37	145-L1	no failure / interruption
	146-L2	no failure / interruption
	147-L3	no failure / interruption
	148-PEN	no failure / interruption
S38	149-L1	x
	150-L2	81:43
	151-L3	x
	152-PEN	x
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
S42	165-L1	no failure / interruption
	166-L2	no failure / interruption
	167-L3	no failure / interruption
	168-PEN	no failure / interruption

Specimen 34: cables NHXCH 4x16/16 RM FE180 PH90/E90
Specimen 35: cables NHXH 4x16 RM FE180 PH90/E90
Specimen 37: cables NHXH 4x1,5 RE FE180 PH30/E30
Specimen 38: cables NHXCH 4x50/25 RM FE180 PH30/E30
Specimen 39: cables NHXCH 4x1,5/1,5 RE FE180 PH30/E30
Specimen 40: cable NHXH 4x50 RM FE180 PH90/E90
Specimen 41: cable NHXH 4x50 RM FE180 PH90/E90
Specimen 42: cable NHXH 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 S43 to S49

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S43	169-L1	no failure / interruption
	170-L2	no failure / interruption
	171-L3	no failure / interruption
	172-PEN	no failure / interruption
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	65:38
	190-L2	x
	191-L3	x
	192-PEN	x
S49	193-L1	no failure / interruption
	194-L2	no failure / interruption
	195-L3	no failure / interruption
	196-PEN	no failure / interruption

Specimen 43: cable NHXH 4x1,5 RE FE180 PH90/E90
Specimen 44: cable NHXH 4x50 RM FE180 PH90/E90
Specimen 45: cable NHXH 4x50 RM FE180 PH90/E90
Specimen 46: cable NHXH 4x1,5 RE FE180 PH90/E90
Specimen 47: cable NHXH 4x1,5 RE FE180 PH90/E90
Specimen 48: cables NHXH 4x50 RM FE180 PH90/E90
Specimen 49: cables NHXH 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 S52 to S59

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S52A	209-L	no failure / interruption
	210-PEN	no failure / interruption
S52B	211-L	no failure / interruption
	212-PEN	no failure / interruption
S53A	213-L	no failure / interruption
	214-PEN	no failure / interruption
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	no failure / interruption
	222-PEN	no failure / interruption
S55B	223-L	no failure / interruption
	224-PEN	no failure / interruption
S56A	225-L	no failure / interruption
	226-PEN	no failure / interruption
S56B	227-L	no failure / interruption
	228-PEN	no failure / interruption
S57A	229-L	24:42
	230-PEN	x
S57B	231-L	36:25
	232-PEN	x
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	no failure / interruption
	238-PEN	no failure / interruption
S59B	239-L	no failure / interruption
	240-PEN	no failure / interruption

Specimens 52: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimens 53: cables HDGszo 3x2,5 FE180 PH90/E30-E90
Specimen 54A: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimen 54B: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90
Specimens 55: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90
Specimens 56: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimens 57: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90
Specimens 58: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90
Specimens 59: cables HDGszo 3x2,5 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 / 0,3W.
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	no failure / interruption
	242-PEN	no failure / interruption
S60B	243-L	no failure / interruption
	244-PEN	no failure / interruption
S61A	245-L	no failure / interruption
	246-PEN	no failure / interruption
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
S63A	253-L	no failure / interruption
	254-PEN	no failure / interruption
S63B	255-L	no failure / interruption
	256-PEN	no failure / interruption
S64A	257-L	no failure / interruption
	258-PEN	no failure / interruption
S64B	259-L	no failure / interruption
	260-PEN	no failure / interruption
S65A	261-L	no failure / interruption
	262-PEN	no failure / interruption
S65B	263-L	no failure / interruption
	264-PEN	no failure / interruption
S66A	265-L	no failure / interruption
	266-PEN	no failure / interruption
S66B	267-L	no failure / interruption
	268-PEN	no failure / interruption
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 HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimen 61A: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90
Specimen 61B: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90
Specimen 62A: cables HDGszo 3x2,5 FE180 PH90/E30-E90
Specimen 62B: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimen 63A: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90
Specimen 63B: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimen 64A: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimen 64B: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90
Specimens 65: cables HDGszo 3x2,5 FE180 PH90/E30-E90
Specimens 66: cables HTKSH 1x2x0,8 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 diodes 3V / 0,3W. Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S68 to S75

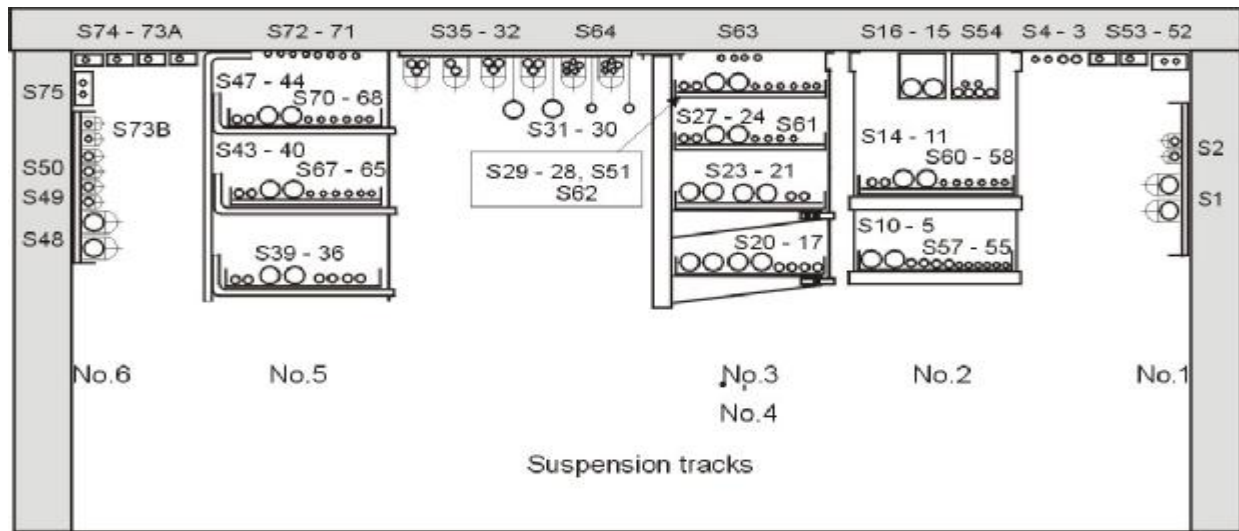
Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S68A	273-L	no failure / interruption
	274-PEN	no failure / interruption
S68B	275-L	47:40
	276-PEN	x
S69A	277-L	no failure / interruption
	278-PEN	no failure / interruption
S69B	279-L	no failure / interruption
	280-PEN	no failure / interruption
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	49:53
	288-PEN	x
S72A	289-L	no failure / interruption
	290-PEN	no failure / interruption
S72B	291-L	no failure / interruption
	292-PEN	no failure / interruption
S73A	293-L	no failure / interruption
	294-PEN	no failure / interruption
S73B	295-L	no failure / interruption
	296-PEN	no failure / interruption
S74A	297-L	no failure / interruption
	298-PEN	no failure / interruption
S74B	299-L	no failure / interruption
	300-PEN	no failure / interruption
S75A	301-L	no failure / interruption
	302-PEN	no failure / interruption
S75B	303-L	no failure / interruption
	304-PEN	no failure / interruption

Specimens 68: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90
Specimens 69: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimens 70: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90
Specimen 71A: cables HDGszo 3x2,5 FE180 PH90/E30-E90
Specimen 71B: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90
Specimen 72A: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90
Specimen 72B: cables HDGszo 3x2,5 FE180 PH90/E30-E90
Specimen 73A: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90
Specimen 73B: cables HDGszo 3x2,5 FE180 PH90/E30-E90
Specimens 74: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90
Specimens 75: cables HDGszo 3x2,5 FE180 PH90/E30-E90

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

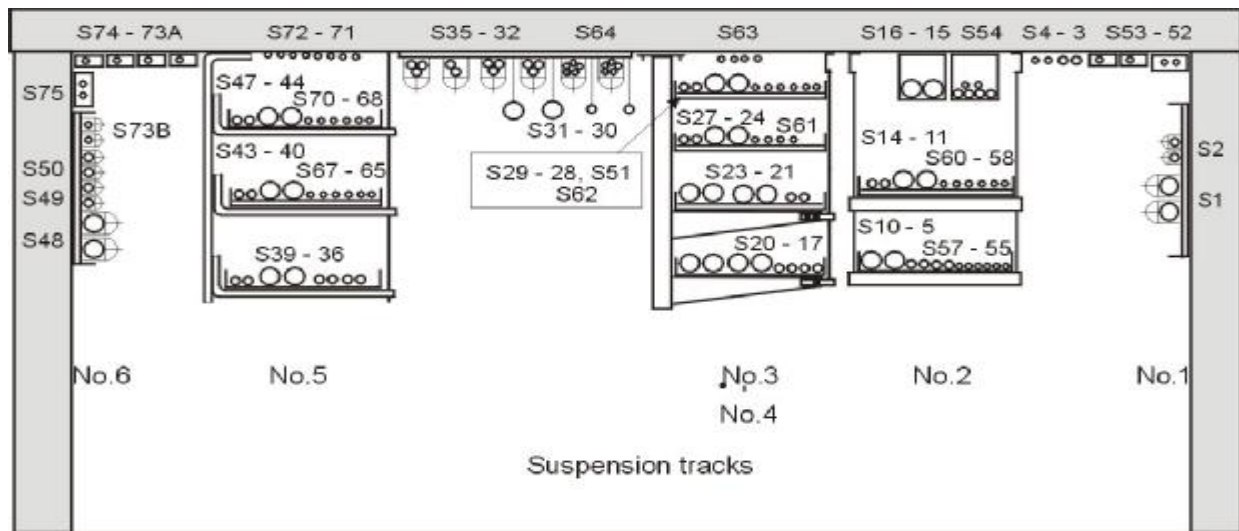
Signal cables were tested by three-phase voltage supply 1 x 110V with LED diods 3V / 0,03W.
Circuit breakers with rating 3 A were used.

Layout of cables in the test furnace



Specimen 1: cables NHXCH 4x50/25 RM FE180 PH90/E90	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.1
Specimen 2: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90	
Specimen 3: cables NHXH 4x50 RM FE180 PH90/E90	Specimens placed in ceiling clips UEF (BAKS) in spacing of 600 mm.
Specimen 4: cables NHXH 4x1,5 RE FE180 PH90/E90	
Specimen 5: cable NHXH 4x1,5 RE FE180 PH90/E90	
Specimen 6: cable NHXH 4x1,5 RE FE180 PH90/E90	
Specimen 7: cable NHXH 4x50 RM FE180 PH90/E90	Specimens placed on the ladders DGOD 400H60/3E (BAKS). Suspension track No.2
Specimen 8: cable NHXH 4x50 RM FE180 PH90/E90	
Specimen 9: cable NHXCH 4x50/25 RM FE180 PH90/E90	
Specimen 10: cable NHXCH 4x50/25 RM FE180 PH90/E90	
Specimen 11: cable NHXH 4x50 RM FE180 PH90/E90	Specimens placed in the trays KCOJ 400H60/3E (BAKS). Suspension track No.2
Specimen 12: cable NHXH 4x50 RM FE180 PH90/E90	
Specimen 13: cable NHXH 4x1,5 RE FE180 PH90/E90	
Specimen 14: cable NHXH 4x1,5 RE FE180 PH90/E90	
Specimen 15: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90	Specimens placed in ceiling clips OZO (BAKS) in spacing of 600 mm.
Specimen 16: cables NHXCH 4x50/25 RM FE180 PH90/E90	
Specimen 17: cables NHXCH 4x1,5/1,5 RE FE180 PH30/E30	
Specimen 18: cables NHXH 4x1,5 RE FE180 PH30/E30	Specimens placed on the ladders DUOP 400H60/3N (BAKS). Suspension track No.4
Specimen 19: cables NHXCH 4x50/25 RM FE180 PH30/E30	
Specimen 20: cables NHXH 4x50 RM FE180 PH30/E30	
Specimen 21: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90	Specimens placed in the trays KCOD 400H60/3N (BAKS). Suspension track No.4
Specimen 22: cables NHXCH 4x50/25 RM FE180 PH90/E90	
Specimen 23: cables NHXH 4x50 RM FE180 PH30/E30	
Specimen 24: cable NHXCH 4x50/25 RM FE180 PH90/E90	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.3
Specimen 25: cable NHXCH 4x50/25 RM FE180 PH90/E90	
Specimen 26: cable NHXCH 4x1,5/1,5 RE FE180 PH90/E90	
Specimen 27: cable NHXCH 4x1,5/1,5 RE FE180 PH90/E90	
Specimen 28: cables NHXH 4x50 RM FE180 PH90/E90	Specimens placed on the ladders DUOP 400H60/3N (BAKS). Suspension track No.3
Specimen 29: cables NHXH 4x1,5 RE FE180 PH90/E90	
Specimen 30: cables NHXH 4x1,5 RE FE180 PH90/E90	Specimens placed in ceiling clips KSA with threaded bar PGM6/1x150 (BAKS) in spacing of 600 mm.
Specimen 31: cables NHXH 4x50 RM FE180 PH90/E90	
Specimen 32: cables NHXH 4x1,5 RE FE180 PH90/E90	
Specimen 33: cables NHXCH 4x1,5/1,5 RE FE180 PH90/E90	Specimens placed in ceiling profile ledges SDOC 400 with clips UKO1 (BAKS) in spacing of 600 mm.
Specimen 34: cables NHXCH 4x16/16 RM FE180 PH90/E90	
Specimen 35: cables NHXH 4x16 RM FE180 PH90/E90	
Specimen 37: cables NHXH 4x1,5 RE FE180 PH30/E30	Specimens placed in the trays KCOD 400H60/3N (BAKS). Suspension track No.5
Specimen 38: cables NHXCH 4x50/25 RM FE180 PH30/E30	
Specimen 39: cables NHXCH 4x1,5/1,5 RE FE180 PH30/E30	
Specimen 40: cable NHXH 4x50 RM FE180 PH90/E90	Specimens placed on the ladders DUOP 400H60/3N (BAKS). Suspension track No.5
Specimen 41: cable NHXH 4x50 RM FE180 PH90/E90	

Layout of cables in the test furnace



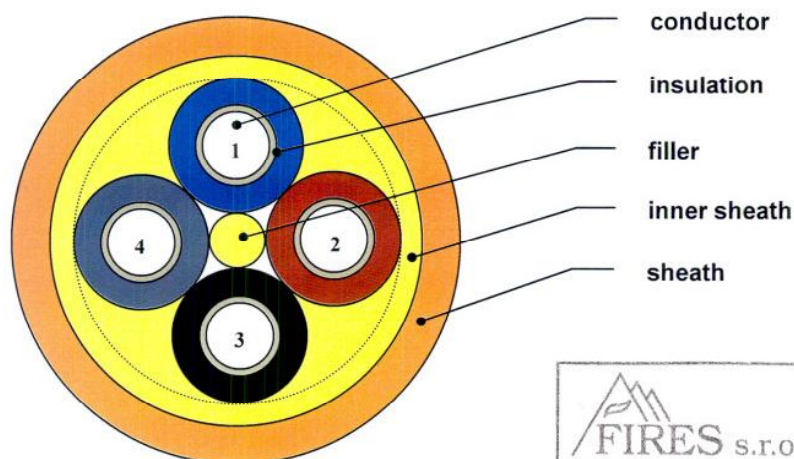
Specimen 42: cable NHXH 4x1,5 RE FE180 PH90/E90	Specimens placed on the ladders DUOP 400H60/3N (BAKS). Suspension track No.5
Specimen 43: cable NHXH 4x1,5 RE FE180 PH90/E90	
Specimen 44: cable NHXH 4x50 RM FE180 PH90/E90	Specimens placed in the trays KCOD 400H60/3N (BAKS). Suspension track No.5
Specimen 45: cable NHXH 4x50 RM FE180 PH90/E90	
Specimen 46: cable NHXH 4x1,5 RE FE180 PH90/E90	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.6
Specimen 47: cable NHXH 4x1,5 RE FE180 PH90/E90	
Specimen 48: cables NHXH 4x50 RM FE180 PH90/E90	
Specimen 49: cables NHXH 4x1,5 RE FE180 PH90/E90	
Specimens 52: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	Specimens placed in plastic ledge with clips UDF and UEF in spacing of 300 mm.
Specimens 53: cables HDGszo 3x2,5 FE180 PH90/E30-E90	
Specimen 54A: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	Specimens placed in ceiling clips OZO (BAKS) in spacing of 600 mm.
Specimen 54B: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	
Specimens 55: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	Specimens placed on the ladders DGOD 400H60/3E (BAKS). Suspension track No.2
Specimens 56: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	
Specimens 57: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90	Specimens placed in the trays KCOJ 400H60/3E (BAKS). Suspension track No.2
Specimens 58: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	
Specimens 59: cables HDGszo 3x2,5 FE180 PH90/E30-E90	Specimens placed on the ladders DGOP 400H60/3N (BAKS). Suspension track No.3
Specimens 60: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	
Specimen 61A: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90	Specimens placed on the ladders DUOP 400H60/3N (BAKS). Suspension track No.3
Specimen 61B: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	
Specimen 62A: cables HDGszo 3x2,5 FE180 PH90/E30-E90	Specimens placed in ceiling clips KSA (BAKS) in spacing of 600 mm
Specimen 62B: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	
Specimen 63A: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	Specimens placed in ceiling profile ledges SDOC 400 with clips UKO1 (BAKS) in spacing of 600 mm.
Specimen 63B: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	
Specimen 64A: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	Specimens placed on the ladders DUOP 400H60/3N (BAKS). Suspension track No.5
Specimen 64B: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90	
Specimens 65: cables HDGszo 3x2,5 FE180 PH90/E30-E90	Specimens placed in the trays KCOD 400H60/3N (BAKS). Suspension track No.5
Specimens 66: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	
Specimens 67: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	Specimens placed in ceiling clips UDF (BAKS) in spacing of 600 mm.
Specimens 68: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90	
Specimens 69: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	Specimens placed in ceiling clips UEF (BAKS) in spacing of 600 mm.
Specimens 70: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	
Specimen 71A: cables HDGszo 3x2,5 FE180 PH90/E30-E90	Specimens placed on the ladders DGOP 400H60/3N. No.6
Specimen 71B: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90	
Specimen 72A: cables HDGsekwzo 3x2,5 FE180 PH90/E30-E90	Specimens placed in plastic ledge with clips UDF in spacing of 300 mm.
Specimen 72B: cables HDGszo 3x2,5 FE180 PH90/E30-E90	
Specimen 73B: cables HDGszo 3x2,5 FE180 PH90/E30-E90	
Specimen 73A: cables HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	
Specimens 74: cables HTKSH 1x2x0,8 FE180 PH90/E30-E90	
Specimens 75: cables HDGszo 3x2,5 FE180 PH90/E30-E90	

Photos taken before the test



Photos taken after the termination of the test



NHXX FE180 PH30/E30 0,6/1 kV**FIRE RESISTANT HALOGEN FREE POWER CABLES**

 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>16.01.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FR-004-09-AWE</i>	
Příloha č./Appendix No. <i>16</i>	

APPLICATIONS

NHXX 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 certified by Scientific and Research Development Centre for Fire Protection (Centrum Naukowo-Badawcze Ochrony Przeciwpowazarowej) 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%). |



 POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Datum/Date 16.01.2009
	Podpis/Signature <i>[Signature]</i>
Dokument o. Document No. FIRES-FR-004-09-AWE	
Priloha A /Appendix No. 14	

ISO
9001:2000

NHXH FE180 PH30/E30 0,6/1 kV

CHARACTERISTICS

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

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

Operating voltage	0.6/1 kV	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.)
	mm ²	mm	kg/km	kg/km
	1 x 6,0 RE	8,3	58,0	120
	1 x 10 RE	9,3	96,0	160
	1 x 16 RE	10,3	154,0	240
	1 x 25 RM	12,3	240,0	340
	1 x 35 RM	13,4	336,0	450
	1 x 50 RM	14,1	480,0	570
	1 x 70 RM	15,9	672,0	775
	1 x 95 RM	17,7	912,0	1030
	1 x 120 RM	19,3	1152,0	1260
	2 x 1,5 RE	13,2	28,8	245
	2 x 2,5 RE	14,0	48,0	285
	2 x 4,0 RE	14,9	77,0	345
	2 x 6,0 RE	15,9	115,0	415
	2 x 10 RE	17,6	192,0	550
	2 x 16 RE	19,6	307,0	745
	2 x 25 RM	23,2	480,0	1030
	3 x 1,5 RE	13,7	43,2	270
	3 x 2,5 RE	14,6	72,0	325
	3 x 4,0 RE	15,6	115,0	400
	3 x 6,0 RE	16,7	173,0	490
	3 x 10 RE	18,5	288,0	670

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
	3 x 16 RM	20,9	461,0	885
	3 x 25 RM	24,6	720,0	1270
	4 x 1,5 RE	14,7	58,0	315
	4 x 2,5 RE	15,7	96,0	380
	4 x 4,0 RE	16,9	154,0	475
	4 x 6,0 RE	18,1	230,0	585
	4 x 10 RE	20,1	384,0	805
	4 x 16 RM	22,7	614,0	1095
	4 x 25 RM	26,8	960,0	1550
	4 x 35 RM	30,7	1920,0	1550
	4 x 50 RM	31,7	1920,0	2590
	5 x 1,5 RE	15,8	72,0	365
	5 x 2,5 RE	16,9	120,0	445
	5 x 4,0 RE	18,2	192,0	560
	5 x 6,0 RE	19,5	288,0	695
	5 x 10 RE	21,8	480,0	965
	5 x 16 RM	24,8	768,0	1320
	5 x 25 RM	28,5	1200,0	1880
	5 x 35 RM	31,8	1680,0	2480
	5 x 50 RM	35,0	2400,0	3180
	7 x 1,5 RE	16,9	101,0	425

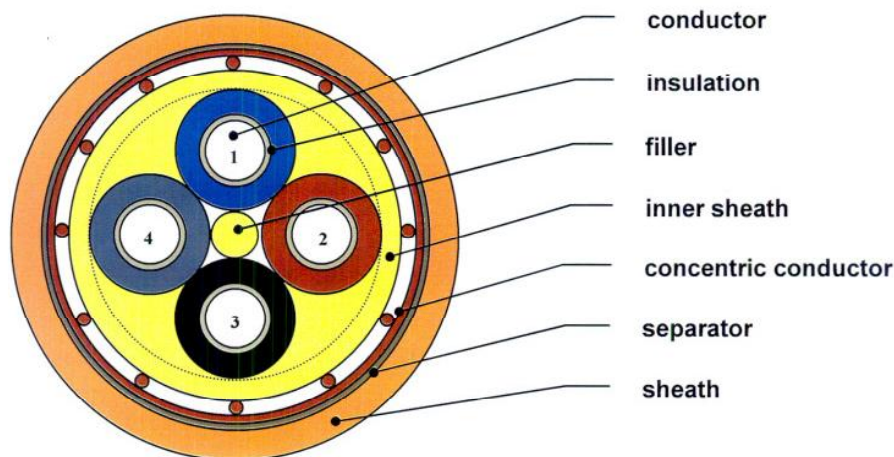
Other cross-sections and conductor counts available on request.

TECHNOKABEL SA, 04-343 Warszawa, ul. Nasielska 55, POLAND
Export Department: tel +(48 22) 516 97 67, fax +(48 22) 516 97 87www.technokabel.com.pl
export@technokabel.com.pl

K199A02B

NHXCH FE180 PH30/E30 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

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

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

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

NHXCH 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

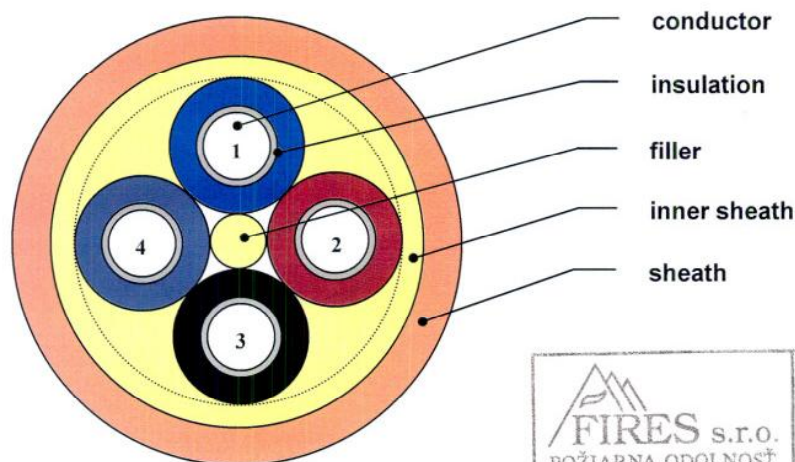
Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm ²	mm	kg/km	kg/km
	3 x 1,5 RE/1,5	15,4	43,2	320
	3 x 2,5 RE/2,5	16,5	72	390
	3 x 4,0 RE/4,0	17,6	115	460
	3 x 6,0 RE/6,0	19,6	173	590
	3 x 10 RE/10	22,6	288	840
	3 x 16 RE/16	25,8	461	1190
	3 x 25 RM/16	29,1	720	1570
	3 x 35 RM/16	32,7	1190	1960
	3 x 50 RM/25	35,7	1723	2560
	4 x 1,5 RE/1,5	15,8	72	350
	4 x 2,5 RE/2,5	17,8	96	450
	4 x 4,0 RE/4,0	18,9	154	530

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	21,1	230	690
	4 x 10 RE/10	25,8	384	1020
	4 x 16 RE/16	25,2	614	1280
	4 x 25 RM/16	31,5	960	1890
	4 x 35 RE/16	32,3	1498	2350
	4 x 50 RM/25	34,4	2160	2870
	7 x 1,5 RE/2,5	19,5	101	520
	7 x 2,5 RE/2,5	20,7	168	620
	12 x 1,5 RE/2,5	24,6	101	830
	12 x 2,5 RE/4,0	26,7	168	1030

Other cross-sections and conductor counts available on request.

 FIRE S.R.O. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č./Document No. <i>FIRES-FR-004-04-AWE</i>	
Příloha č./Appendix Nb. <i>19</i>	

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>16.01.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. / Document No. <i>FIRES-FR-004-09-PWE</i>	
Príloha č./Appendix No. <i>20</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 16.01.2009
	Podpis/Signature <i>[Signature]</i>
	Dokument č. Document No. <i>FIRES-FR-009-09-ANNE</i>
Príloha č./Appendix No. <i>21</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 ÷ 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.

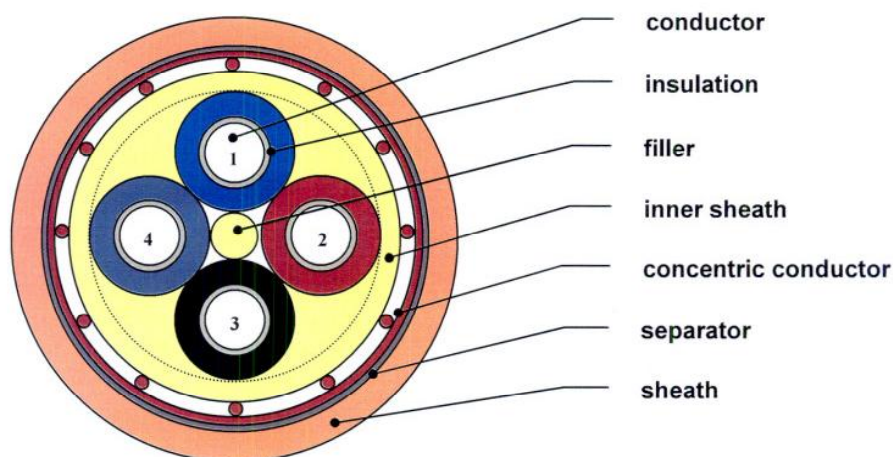
CE = the cable meets requirements of the low voltage directive 2006/95/WE

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	58,0	125
	1 x 10 RE	9,4	96,0	170
	1 x 16 RE	10,4	154,0	250
	1 x 25 RM	12,4	240,0	355
	1 x 35 RM	13,4	336,0	450
	1 x 50 RM	14,5	480,0	580
	1 x 70 RM	16,4	672,0	790
	1 x 95 RM	18,1	912,0	1040
	1 x 120 RM	19,7	1152,0	1275
	2 x 1,5 RE	14,0	28,8	265
	2 x 2,5 RE	14,8	48,0	315
	2 x 4,0 RE	15,7	77,0	375
	2 x 6,0 RE	16,7	115,0	445
	2 x 10 RE	18,4	192,0	585
	2 x 16 RE	20,4	307,0	780
	2 x 25 RM	24,0	480,0	925
	3 x 1,5 RE	14,9	43,2	315
	3 x 2,5 RE	15,5	72,0	355
	3 x 4,0 RE	16,5	115,0	435
	3 x 6,0 RE	17,6	173,0	525
	3 x 10 RE	19,3	288,0	690

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
	3 x 16 RE	22,0	461,0	980
	3 x 25 RM	25,5	720,0	1390
	4 x 1,5 RE	15,7	58,0	350
	4 x 2,5 RE	16,7	96,0	420
	4 x 4,0 RE	17,8	154,0	510
	4 x 6,0 RE	19,0	230,0	625
	4 x 10 RE	20,9	384,0	835
	4 x 16 RM	23,7	614,0	1140
	4 x 25 RM	27,8	960,0	1720
	4 x 35 RM	29,5	1344,0	2050
	4 x 50 RM	32,7	1920,0	2660
	5 x 1,5 RE	17,2	72,0	425
	5 x 2,5 RE	18,2	120,0	505
	5 x 4,0 RE	19,3	192,0	610
	5 x 6,0 RE	20,7	288,0	750
	5 x 10 RE	22,7	480,0	1000
	5 x 16 RE	26,3	768,0	1460
	5 x 25 RM	30,6	1200,0	2100
	5 x 35 RM	32,9	1680,0	2550
	5 x 50 RM	37,7	2400,0	3550
	7 x 1,5 RE	18,1	101,0	475

Other cross-sections and conductor counts available on request.

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

NHXCH FE180 PH90/E90 0,6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

Halogen free cables shall be applied in locations where, in case of fire, higher safety for human beings and expensive electronic equipment is required.

Functions of the cables are maintained – power is supplied to equipment which must operate in fire conditions and during fire fighting. The cables are flame retardant and their smoke emission is low, emitted fumes are non toxic and non corrosive.

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

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

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

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

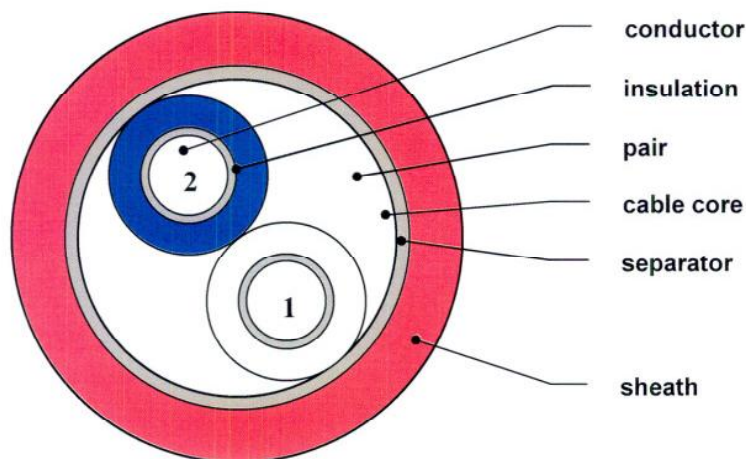
Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm ²	mm	kg/km	kg/km
	3 x 1,5RE/1,5	16,6	43,2	360
	3 x 2,5 RE/2,5	17,7	72	430
	3 x 4,0 RE/4,0	18,8	115	520
	3 x 6,0 RE/6,0	20,8	173	660
	3 x 10 RE/10	23,8	288	940
	3 x 16 RE/16	26,2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

 FIRE S.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 16.07.2009
	Podpis/Signature 
Dokument č. / Document No. FIRE-FR-005-09-AWE	
Příloha č./Appendix No. 23	

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	100	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

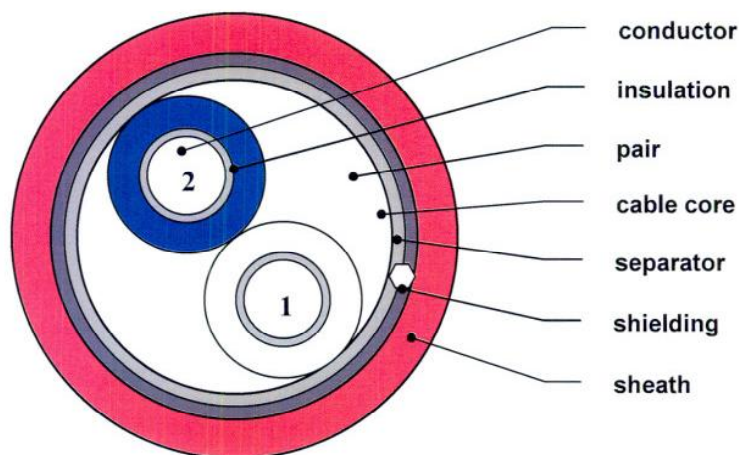
* Circuit integrity is dependent on installation method.

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	15	61
HTKSH FE180 PH90/E30-E90	1 x 2 x 1.0	7.7	20	70

Other diameters and conductor counts available on request.

 FIRES S.R.O. POŽIARNÁ ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 16.07.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. / Document No. <i>FIRES-FR-004-09-AWE</i>	
Príloha č./Appendix No. <i>25</i>	

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

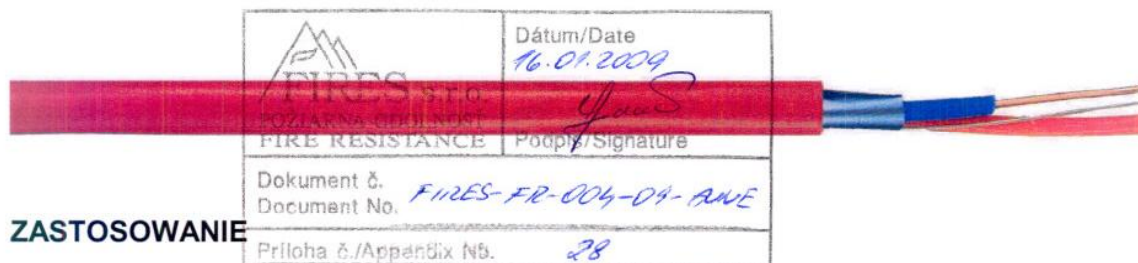
Cable type	Number of pairs (x 2) x conductor diameter	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm	mm	kg/km	kg/km
HTKSHekw FE180 PH90/E30-E90	1 x 2 x 0.8	7.4	15	66
HTKSHekw FE180 PH90/E30-E90	1 x 2 x 1.0	7.8	20	75

Other diameters and conductor counts available on request.

 FIRES S.I.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. / Document No. FIRES-FR-004-09-AWE	
Príloha č./Appendix No. 28	

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, BEZHAŁOGENOWE**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, brązowy	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 50268-2-3, IEC 61034-2
Maksymalna dopuszczalna temperatura przy żyłach w warunkach pracy przy zwarciu (max.5 s)	+ 85°C + 250°C	przepuszczalność światła, min.	60 %
Zakres temperatur pracy podczas pracy podczas układania	od - 25 do + 85°C od -10 do + 50°C	Palność kabla	nie rozprzestrzeniający płomienia
Minimalny promień gięcia kable jednożyłowe kable wielożyłowe	10 x średnica kabla 6 x średnica kabla	Próby palności Podtrzymanie funkcji:	PN-EN 50266-2-2, IEC 60332-3-22 (cat.A)
		E30-E90 PH90	DIN 4102-12 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

Symbol wyrobu	Liczba x średnica żył	Średnica zewnętrzna (około)	Indeks miedziowy	Masa kabla (około)
	mm	mm	kg/km	kg/km
HDGs	4 x 1,5	8,9	58	125
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

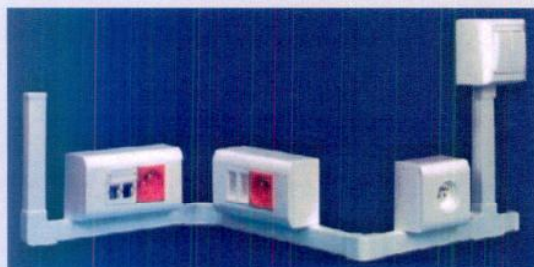
Na zamówienie klienta wykonujemy przewody o innych średnicach i innej liczbie żył.

 POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 16. 07. 2009
	Podpis/Signature <i>[Signature]</i>
	Dokument č. / Document No. <i>FIRES-FR-009-09-ANKE</i>
Príloha č./Appendix No. <i>19</i>	

	Dátum/Date 16.01.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. FIRES-FR-005-09-ALWE	
Document No.	
Priloha č./Appendix No. 30	

Kanały Kablowe Elektroinstalacyjne LS, KS i KP Emiter

PODSTAWOWE CECHY KANAŁÓW KABLOWYCH BEZHAŁOGENOWYCH



Kanały kablowe, elektroinstalacyjne LS, KS i KP przeznaczone są do prowadzenia małych, średnich i dużych instalacji elektrycznych i teleinformatycznych.

Montaż osprzętu, w kanałach LS i KS, proponujemy w obudowach natynkowych systemu Emiter (OBUK) lub podstawach natynkowych zalecanych przez innych producentów.

Montaż osprzętu 45x45, w kanałach KP, proponujemy bezpośrednio w kanale przy wykorzystaniu uchwytów szybkiego montażu UCHKP.

PARAMETRY TECHNICZNE CHARAKTERYZUJĄCE KANAŁY KABLOWE

Klasyfikacja ze względu na:	Opis/cechowanie:
Materiał	Modyfikowany poliolefin, klasa palności V-0, kolor naturalny
Własności mechaniczne	Listwy dla średnich narażeń mechanicznych (odporność na uduary 2J)
Odporność na temperaturę	Temperatura montażu: minimalna -5°C maksymalna +60°C Temperatura pracy: minimalna -45°C maksymalna +90°C
Odporność na rozprzestrzenianie płomienia	Nie rozprzestrzeniają płomienia, po odjęciu źródła ognia listwa gaśnie
Ochronę przed ciałami stałymi i pyłem oraz przed wnikaniem wody	IP 30 – listwy chronią przed przedostaniem się do ich wnętrza ciał obcych o średnicy 2,5 mm i większej – listwy nie chronią przed wnikaniem wody

Kanały kablowe LS i KS spełnia wymagania zawarte w normie PN-EN 50085-1, 2001,

symbol (szer x wys)	nazwa	ilość w opakowaniu	waga
LS 15x10	kanal elektroinstalacyjny LS 15x10	25szt.	0,180 kg/szt.
LS 12x12	kanal elektroinstalacyjny LS 12x12	25szt.	0,168 kg/szt.
LS 20x12	kanal elektroinstalacyjny LS 20x12	25szt.	0,280 kg/szt.
LS 25x12	kanal elektroinstalacyjny LS 25x12	25szt.	0,320 kg/szt.
LS 17x15	kanal elektroinstalacyjny LS 17x15	25szt.	0,240 kg/szt.
LS 20x18	kanal elektroinstalacyjny LS 20x18	25szt.	0,320 kg/szt.
LS 25x18	kanal elektroinstalacyjny LS 25x18	10szt.	0,320 kg/szt.
LS 35x18	kanal elektroinstalacyjny LS 35x18	10szt.	0,450 kg/szt.
LS 35x18 P	kanal elektroinstalacyjny LS 35x18 P	10szt.	0,490 kg/szt.
LS 50x18	kanal elektroinstalacyjny LS 50x18	10szt.	0,760 kg/szt.
LS 50x18 P	kanal elektroinstalacyjny LS 50x18 P	10szt.	0,800 kg/szt.
LS 60x18 2P	kanal elektroinstalacyjny LS 60x18 2P	10szt.	0,760 kg/szt.
LS 40x25	kanal elektroinstalacyjny LS 40x25	10szt.	0,580 kg/szt.
LS 35x30	kanal elektroinstalacyjny LS 35x30	10szt.	0,560 kg/szt.
LS 50x30 P	kanal elektroinstalacyjny LS 50x30 P	10szt.	0,940 kg/szt.
LS 40x40	kanal elektroinstalacyjny LS 40x40	10szt.	0,760 kg/szt.
LS 60x40	kanal elektroinstalacyjny LS 60x40	10szt.	1,000 kg/szt.
LS 60x40 P	kanal elektroinstalacyjny LS 60x40 P	10szt.	1,002 kg/szt.
KS 90x40	kanal elektroinstalacyjny KS 90x40	4szt.	1,580 kg/szt.
KS 90x40 P	kanal elektroinstalacyjny KS 90x40 P	4szt.	1,640 kg/szt.
KS 90x60	kanal elektroinstalacyjny KS 90x60	4szt.	1,940 kg/szt.
KP 90x40	kanal elektroinstalacyjny KP 90x40 Bi	4szt.	2,060 kg/szt.
KP 90x60	kanal elektroinstalacyjny KP 90x60	4szt.	2,940 kg/szt.
KP 110x60	kanal elektroinstalacyjny KP 110x60	4szt.	3,100 kg/szt.
KP 130x60	kanal elektroinstalacyjny KP 130x60	4szt.	3,300 kg/szt.

Badanie trasy kablowej BAKS - TECHNOKABEL
Badanie w FIRES Słowacja Data 12-16.01.2009

Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
1	47		NHXXH-J 4x1.5 RE FE180 PH90/E90	1	Korytka kablowe KCOD 400H60/... B-400 1.5 m /10kg/m / grubość blachy 1,2 mm Mocowanie : Wysięgnik WFLO 500 (pionowo) Wysięgnik WFLO 400 , pręt gwintowany PGM10/..., do betonu za pomocą tulei TRSO M10.  FIRES S.R.O. POŽIARNA ODOLNOST' FIRE RESISTANCE Datum/Date 16.01.2009 Podpis/Signature <i>[Signature]</i> Dokument č. <i>FIRES-FR-004-09-AWE</i> Document No.
2	46		NHXXH-J 4x1,5 RE FE180 PH90/E90		
3	45		NHXXH-J 4x50 RM FE180 PH90/E90		
4	44		NHXXH-J 4x50 RM FE180 PH90/E90		
5	70B		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
6	70A		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
7	69B		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
8	69A		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
9	68B		HDGsekwżo 3x2,5 RE FE180 PH90/E90		
10	68A		HDGsekwżo 3x2,5 RE FE180 PH90/E90		
11	43		NHXXH-J 4x1,5 RE FE180 PH90/E90		
12	42		NHXXH-J 4x1,5 RE FE180 PH90/E90	2	Drabinka kablowa DUOP 400H60/... <i>30</i> B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : Wysięgnik WFLO 500 (pionowo) Wysięgnik WFLO 400 , pręt gwintowany PGM10/..., do betonu za pomocą tulei TRSO M10. Rozstaw szczelbi co 300mm.
13	41		NHXXH-J 4x50 RM FE180 PH90/E90		
14	40		NHXXH-J 4x50 RM FE180 PH90/E90		
15	67B		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
16	67A		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
17	66B		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
18	66A		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
19	65B		HDGszo 3x2,5 RE FE180 PH90/E90		
20	65A		HDGszo 3x2,5 RE FE180 PH90/E90		
21	39		NHXXH 4x1,5/1,5 RE FE180 PH30/E30		
22			NHXXH 4x1,5/1,5 RE FE180 PH30/E30		
23	38		NHXXH 4x50/25 RE FE180 PH30/E30	3	Korytka kablowe KCOD 400H60/... B-400 1.5 m /10kg/m / grubość blachy 1,2 mm Mocowanie : Wysięgnik WFLO 500 (pionowo) Wysięgnik WFLO 400 , pręt gwintowany PGM10/..., do betonu za pomocą tulei TRSO M10.
24			NHXXH 4x50/25 RE FE180 PH30/E30		
25	37		NHXXH-J 4x1,5 RE FE180 PH30/E30		
26			NHXXH-J 4x1,5 RE FE180 PH30/E30		
27					
28					
29	29		NHXXH-J 4x1,5 RE FE180 PH90/E90		
30			NHXXH-J 4x1,5 RE FE180 PH90/E90	4	Drabinka kablowa DUOP 400H60/... B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : uchwyty UTMO i wysięgnikach WMCO 300 do betonu za pomocą kołków rozporowych PSRO M10x 80 Rozstaw szczelbi co 300mm.
31	28		NHXXH-J 4x50 RM FE180 PH90/E90		
32			NHXXH-J 4x50 RM FE180 PH90/E90		
33	62B		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
34			HTKSH 1x2x0,8 FE180 PH90/E30-E90		
35	62A		HDGszo 3x2,5 RE FE180 PH90/E90		
36			HDGszo 3x2,5 RE FE180 PH90/E90		
37					
38					
39	27		NHXXH 4x1,5/1,5 RE FE180 PH90/E90		
40	26		NHXXH 4x1,5/1,5 RE FE180 PH90/E90	5	Drabinka kablowa DGOP 400H60/... B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : uchwyty UTMO i wysięgnikach WMCO 300 do betonu za pomocą kołków rozporowych PSRO M10x 80 Rozstaw szczelbi co 150mm.
41	25		NHXXH 4x50/25 RE FE180 PH90/E90		
42	24		NHXXH 4x50/25 RE FE180 PH90/E90		
43	61B		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
44			HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
45	61A		HDGsekwżo 3x2,5 RE FE180 PH90/E30-E90		
46			HDGsekwżo 3x2,5 RE FE180 PH90/E30-E90		

Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
47	23		NHXH-J 4x50 RM FE180 PH30/E30	6	Korytko kablowe KCOD 400H60/... B-400 1.5 m /10kg/m / grubość blachy 1,2 mm Mocowanie : Wspornik WPCO... Wysięgnik WWSO 400 PGM10/..., uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x 80.
48			NHXH-J 4x50 RM FE180 PH30/E30		
49	22		NHXCH 4x50/25 RE FE180 PH90/E90		
50			NHXCH 4x50/25 RE FE180 PH90/E90		
51	21		NHXCH 4x1,5/1,5 RE FE180 PH90/E90		
52			NHXCH 4x1,5/1,5 RE FE180 PH90/E90		
53	20		NHXH-J 4x50 RM FE180 PH30/E30	7	Drabinka kablowa DUOP 400H60/... B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO... Wysięgnik WWSO 400 PGM10/..., uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x 80. Rozstaw szczelbi co 300mm.
54			NHXH-J 4x50 RM FE180 PH30/E30		
55	19		NHXCH 4x50/25 RE FE180 PH30/E30		
56			NHXCH 4x50/25 RE FE180 PH30/E30		
57	18		NHXH-J 4x1,5 RE FE180 PH30/E30		
58			NHXH-J 4x1,5 RE FE180 PH30/E30		
59	17		NHXCH 4x1,5/1,5 RE FE180 PH30/E30	8	Korytko kwasoodporne KCOJ 400H60/... -E B-400 1.5 m /10kg/m / grubość blachy 1,0 mm Mocowanie : PGM10/...-E, ceownik CWOP 40H40/05-E, uchwyt WPPOV-E do betonu za pomocą kołków rozporowych PSRO M10x 80-E
60			NHXCH 4x1,5/1,5 RE FE180 PH30/E30		
61	14		NHXH-J 4x1,5 RE FE 180 PH90/E90		
62	13		NHXH-J 4x1,5 RE FE 180 PH90/E90		
63	12		NHXH-J 4x50 RM FE180 PH90/E90		
64	11		NHXH-J 4x50 RM FE180 PH90/E90		
65	60B		HTKSH 1x2x0,8 FE180 PH90/E30-E90	9	Drabinka kwasoodporna DGOD 400H60/... -E B-400 1.5 m /20kg/m / grubość blachy 1,2 mm Mocowanie : PGM10/...-E, ceownik CWOP 40H40/05-E, uchwyt WPPOV-E do betonu za pomocą kołków rozporowych PSRO M10x 80-E. Rozstaw szczelbi co 150mm.
66	60A		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
67	59B		HDGszo 3x2,5 RE FE180 PH90/E90		
68	59A		HDGszo 3x2,5 RE FE180 PH90/E90		
69	58B		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
70	58A		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
71	10		NHXCH 4x50/25 RE FE180 PH90/E90	10	Uchwyty kablowe UEF i UDF. Mocowanie do betonu co 600mm za pomocą kołka SRO M6x30
72	9		NHXCH 4x50/25 RE FE180 PH90/E90		
73	8		NHXH-J 4x50 RM FE180 PH90/E90		
74	7		NHXH-J 4x50 RM FE180 PH90/E90		
75	6		NHXH-J 4x1,5 RE FE180 PH90/E90		
76	5		NHXH-J 4x1,5 RE FE 180 PH90/E90		
77	57B		HDGsekwzo 3x2,5 RE FE180 PH90/E30-E90	10	Uchwyty kablowe UEF i UDF. Mocowanie do betonu co 600mm za pomocą kołka SRO M6x30
78	57A		HDGsekwzo 3x2,5 RE FE180 PH90/E30-E90		
79	56B		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
80	56A		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
81	55B		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
82	55A		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
83	72B		HDGszo 3x2,5 RE FE180 PH90/E30-E90	10	Uchwyty kablowe UEF i UDF. Mocowanie do betonu co 600mm za pomocą kołka SRO M6x30
84			HDGszo 3x2,5 RE FE180 PH90/E30-E90		
85	72A		HDGsekwzo 3x2,5 RE FE180 PH90/E30-E90		
86			HDGsekwzo 3x2,5 RE FE180 PH90/E30-E90		
87	71B		HDGsekwzo 3x2,5 RE FE180 PH90/E30-E90		
88			HDGsekwzo 3x2,5 RE FE180 PH90/E30-E90		
89	71A		HDGszo 3x2,5 RE FE180 PH90/E30-E90	10	Uchwyty kablowe UEF i UDF. Mocowanie do betonu co 600mm za pomocą kołka SRO M6x30
90			HDGszo 3x2,5 RE FE180 PH90/E30-E90		

	Datum/Date 16.01.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. FIRES-FR-009-09-AWE Document No. Priloha č./Appendix No. 33	

Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
91	35		NHXH-J 4x16 RM FE180 PH90/E90	11	Mocowanie szczebla do betonu co 600 mm za pomocą kołka SRO M 6x30. Po 2,3 i 5 kabli w jednym uchwycie, Uchwyt kablów UKO1 + Szczepel SDOC
92			NHXH-J 4x16 RM FE180 PH90/E90		
93	-		NHXH-J 4x16 RM FE180 PH90/E90		
94	34		NHXCH 4x16/16 RM FE180 PH90/E90		
95			NHXCH 4x16/16 RM FE180 PH90/E90		
96	33		NHXCH 4x1,5/1,5 RE FE180 PH90/E90		
97			NHXCH 4x1,5/1,5 RE FE180 PH90/E90		
98	-		NHXCH 4x1,5/1,5 RE FE180 PH90/E90		
99	-		NHXH-J 4x1,5 RE FE180 PH90/E90		
100	32		NHXH-J 4x1,5 RE FE180 PH90/E90		
101			NHXH-J 4x1,5 RE FE180 PH90/E90		
102	64B		HDGsekwżo 3x2,5 RE FE180 PH90/E30-E90		
103			HDGsekwżo 3x2,5 RE FE180 PH90/E30-E90		
104	-		HDGsekwżo 3x2,5 RE FE180 PH90/E30-E90		
105	-		HDGsekwżo 3x2,5 RE FE180 PH90/E30-E90		
106	-		HDGsekwżo 3x2,5 RE FE180 PH90/E30-E90		
107	64A		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
108			HTKSH 1x2x0,8 FE180 PH90/E30-E90		
109	-		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
110	-		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
111	-		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
112	16		NHXCH 4x50/25 RE FE 180 PH90/E90	12	Obejma zatraskowa OZO Mocowanie do betonu co 600 mm za pomocą kołka GSO 6x40 .
113			NHXCH 4x50/25 RE FE 180 PH90/E90		
114	15		NHXCH 4x1,5/1,5 RE FE 180 PH90/E90		
115			NHXCH 4x1,5/1,5 RE FE 180 PH90/E90		
116	54B		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
117			HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
118	54A		HTKSH 1x2x0,8 FE180 PH90/E30-E90	13	Uchwyty kablów UEF Mocowanie do betonu co 600mm za pomocą kołka KWBO 6x40 .
119			HTKSH 1x2x0,8 FE180 PH90/E30-E90		
120	4		NHXH-J 4x1,5 RE FE180 PH90/E90		
121			NHXH-J 4x1,5 RE FE180 PH90/E90		
122	3		NHXH-J 4x50 RM FE180 PH90/E90	14	Drabinka kablowa DGOP 400H60/... B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : uchwyty UTMO do betonu za pomocą kołków rozporowych PSRO M8x 75. Uchwyty kablów UKO1 co 600mm. Rozstaw szczebli co 150mm.
123			NHXH-J 4x50 RM FE180 PH90/E90		
124	2		NHXCH 4x1,5/1,5 RE FE180PH90/E90		
125			NHXCH 4x1,5/1,5 RE FE180PH90/E90		
126	1		NHXCH 4x50/25 RE FE180PH90/E90	15	Drabinka kablowa DGOP 400H60/... B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : uchwyty UTMO do betonu za pomocą kołków rozporowych PSRO M8x 75. Uchwyty kablów UKO1 co 600mm. Rozstaw szczebli co 150mm.
127			NHXCH 4x50/25 RE FE180PH90/E90		
128	73B		HDGszo 3x2,5 RE FE180 PH90/E30-E90		
129			HDGszo 3x2,5 RE FE180 PH90/E30-E90		
130					
131					
132	49		NHXH-J 4x1,5 RE FE180 PH90/E90		
133			NHXH-J 4x1,5 RE FE180 PH90/E90		
134	48		NHXH-J 4x50 RM FE180 PH90/E90	15	
135			NHXH-J 4x50 RM FE180 PH90/E90		

	Dátum/Date 16.01.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FR-004-09-AWE</i>	
Príloha č./Appendix No. <i>35</i>	

Nr	Nr FIRES	Czas	Symbol kaba	Pozycja	Konstrukcja mocowania, odległość, obciążenie
136	75B		HDGszo 3x2,5 RE FE180 PH90/E90	16	Uchwyty kablowe UDF w listwie bezhalogenowej Mocowanie do betonu co 300mm za pomocą kołka SROM6x30.
137	75A		HDGszo 3x2,5 RE FE180 PH90/E90		
138	74B		HTKSH 1x2x0,8 FE180 PH90/E30-E90	17	Uchwyty kablowe UDF w listwie bezhalogenowej Mocowanie do betonu co 300mm za pomocą kołka SROM6x30.
139	74A		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
140	73A		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90	18	Uchwyty kablowe UDF w listwie bezhalogenowej Mocowanie do betonu co 300mm za pomocą kołka SROM6x30.
141			HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
142	53B		HDGszo 3x2,5 RE FE180 PH90/E30-E90	19	Uchwyty kablowe UDF w listwie bezhalogenowej Mocowanie do betonu co 300mm za pomocą kołka SROM6x30.
143	53A		HDGszo 3x2,5 RE FE180 PH90/E30-E90		
144	52B		HTKSH 1x2x0,8 FE180 PH90/E30-E90	20	Uchwyty kablowe UDF w listwie bezhalogenowej Mocowanie do betonu co 300mm za pomocą kołka SROM6x30.
145	52A		HTKSH 1x2x0,8 FE180 PH90/E30-E90		
146	63B		HTKSH 1x2x0,8 FE180 PH90/E30-E90	21	Uchwyty kablowe KSA Mocowanie do betonu co 600mm za pomocą tulei rozporowych TRSO M6 i pręta gwintowanego M6 lub kołka SROM6x30
147			HTKSH 1x2x0,8 FE180 PH90/E30-E90		
148	63A		HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
149			HTKSHekw 1x2x0,8 FE180 PH90/E30-E90		
150	31		NHXXH-J 4x50 RM FE180 PH90/E90	22	Uchwyty kablowe KSA Mocowanie do betonu co 600mm za pomocą tulei rozporowych TRSO M6 i pręta gwintowanego M6 lub kołka SROM6x30
151			NHXXH-J 4x50 RM FE180 PH90/E90		
152	30		NHXXH-J 4x1,5 RE FE180 PH90/E90		
153			NHXXH-J 4x1,5 RE FE180 PH90/E90		

Zestawienie kabli

Lp	Symbol kaba	Średnica kabla	Ciężar kabla	Ilość
1	NHXXH-J FE 180 PH30/E30 4x 1,5 RE	15 mm	0,31 kg/m	4
2	NHXXH-J FE 180 PH30/E30 4x 50 RM	32 mm	2,60 kg/m	4
3	NHXXCH FE 180 PH30/E30 4x 1,5/1,5 RE	16 mm	0,35 kg/m	4
4	NHXXCH FE 180 PH30/E30 4x 50/25 RM	35 mm	2,87 kg/m	4
5	NHXXH-J FE 180 PH90/E90 4x 1,5 RE	16 mm	0,35 kg/m	19
6	NHXXH-J FE 180 PH90/E90 4x 16 RM	25 mm	1,25 kg/m	3
7	NHXXH-J FE 180 PH90/E90 4x 50 RM	33 mm	2,70 kg/m	16
8	NHXXCH FE 180 PH90/E90 4x 1,5/1,5 RE	17 mm	0,39 kg/m	11
9	NHXXCH FE 180 PH90/E90 4x 16/16 RM	26 mm	1,34 kg/m	2
10	NHXXCH FE 180 PH90/E90 4x 50/25 RM	36 mm	2,95 kg/m	10
11	HTKSH FE180 PH90/E30-E90 1x2x0,8	7 mm	0,07 kg/m	23
12	HTKSH ekw FE180 PH90/E30-E90 1x2x0,8	7 mm	0,06 kg/m	16
13	HDGszo 3x2,5 RE FE180 PH90/E30-E90	10 mm	0,2 kg/m	16
14	HDGsekwzo 3x2,5 RE FE180 PH90/E30-E90	10 mm	0,2 kg/m	14

Pozycja 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21 i 22 stal ocynkowana metodą Sendzimira PN-EN 10327

Pozycja 8, 9, 13 stal kwasoodporna PN-EN 10088 1.4301

 FIRES S.T.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Datum/Date 16.01.2009
	Podpis/Signature 
Dokument №. Document No. <i>FIRES-FR-004-09-ANNE</i>	
Załącznik №./Appendix No. <i>35</i>	

PSR0M10

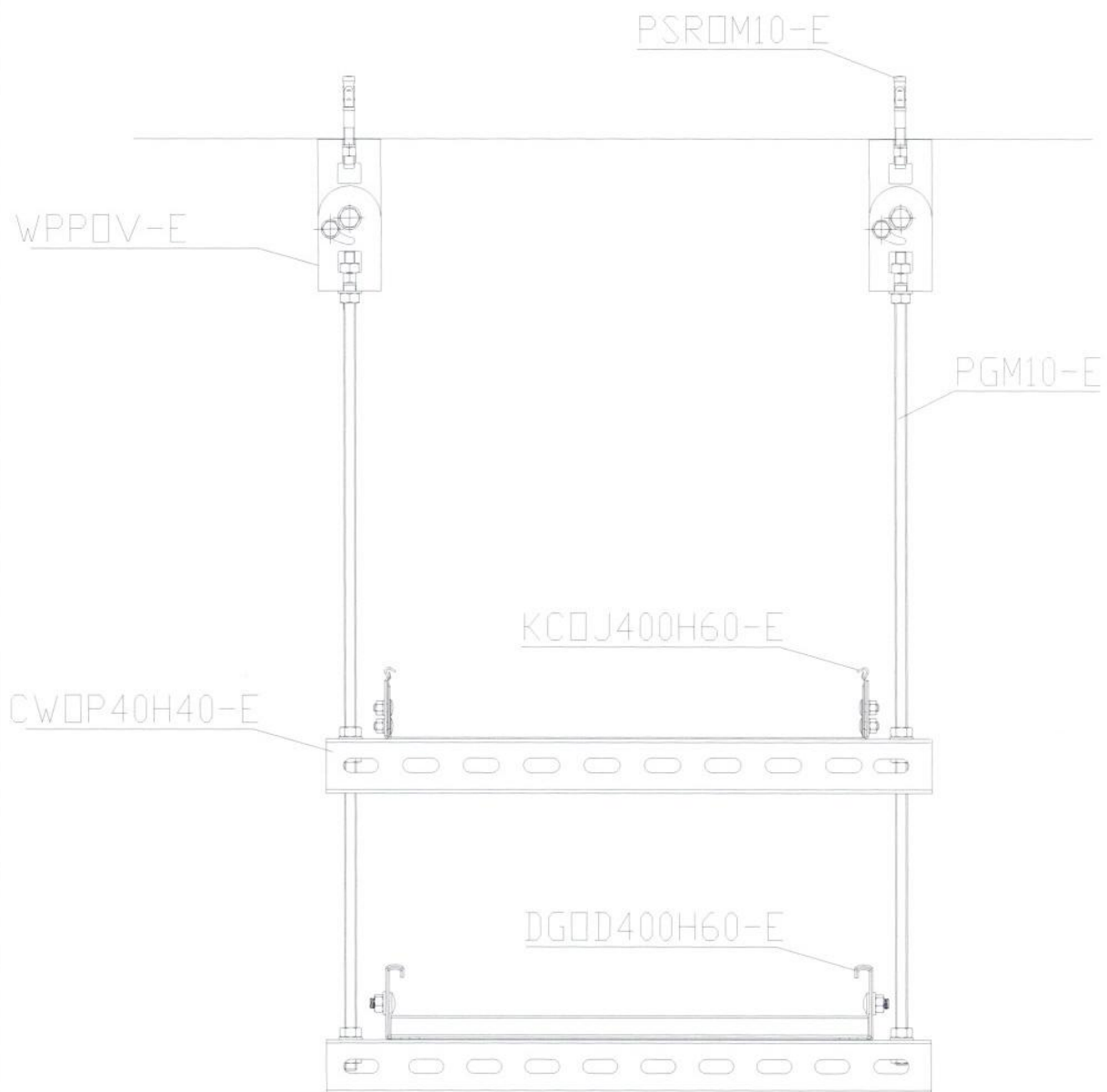
UT0

UK01

DGOP400H60

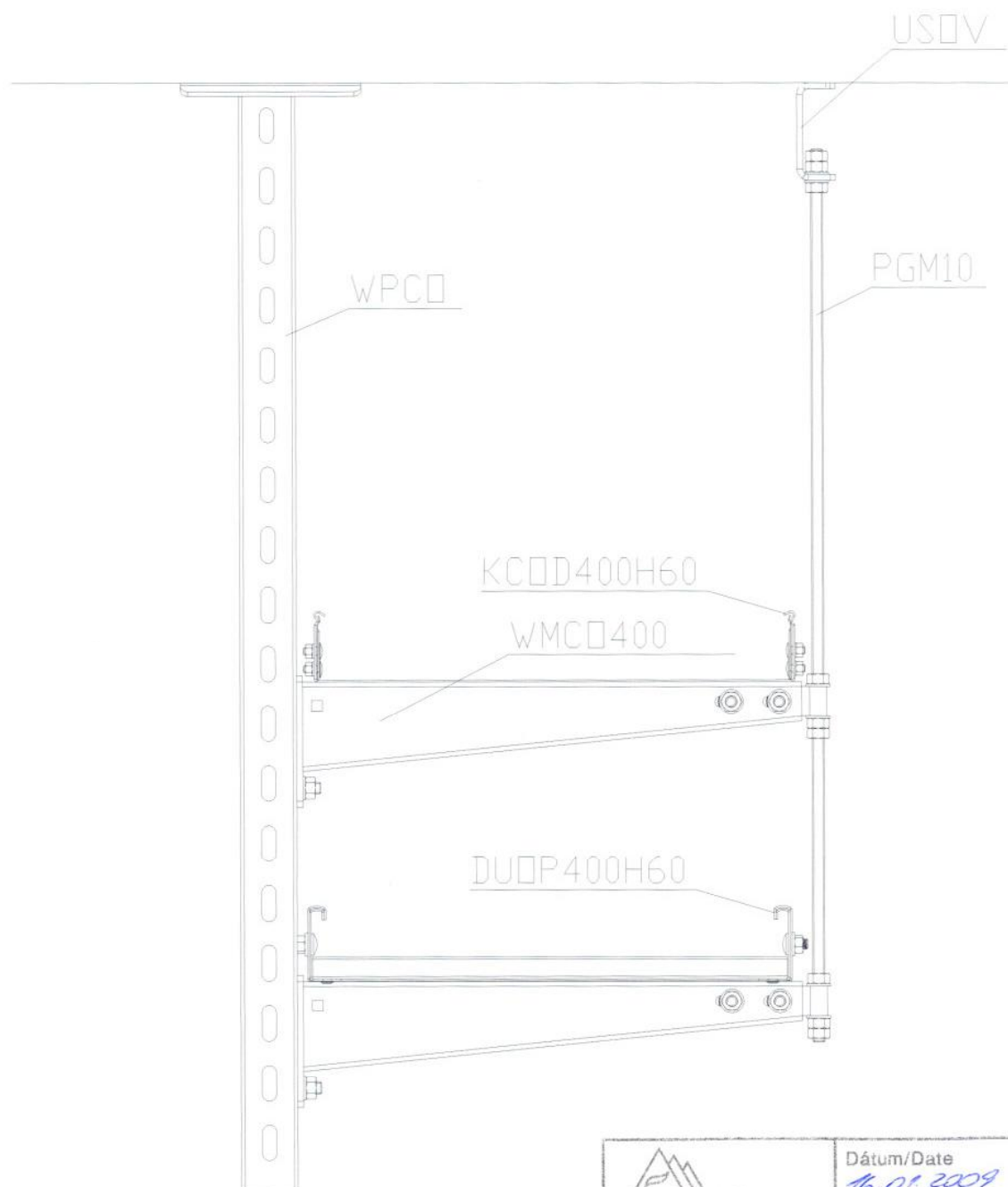
 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date <i>16.01.2009</i>
	<i>J. d. S.</i> Podpis/Signature
	Dokument č. Document No. <i>FIRES-FR-004-09-MNE</i>
	Príloha č./Appendix No. <i>36</i>

Materiál Rodzaj Gatunek Nr normy	<i>Bl. ocynkowana</i>	Nazwa rysunku <i>Rysunek konstrukcja drabinka</i>	Podziałka 1:1
<i>Profesjonalne Systemy Tras Kablowych</i>		BAKS-TECHNOKABEL FIRES 12-16 01 2009rok	



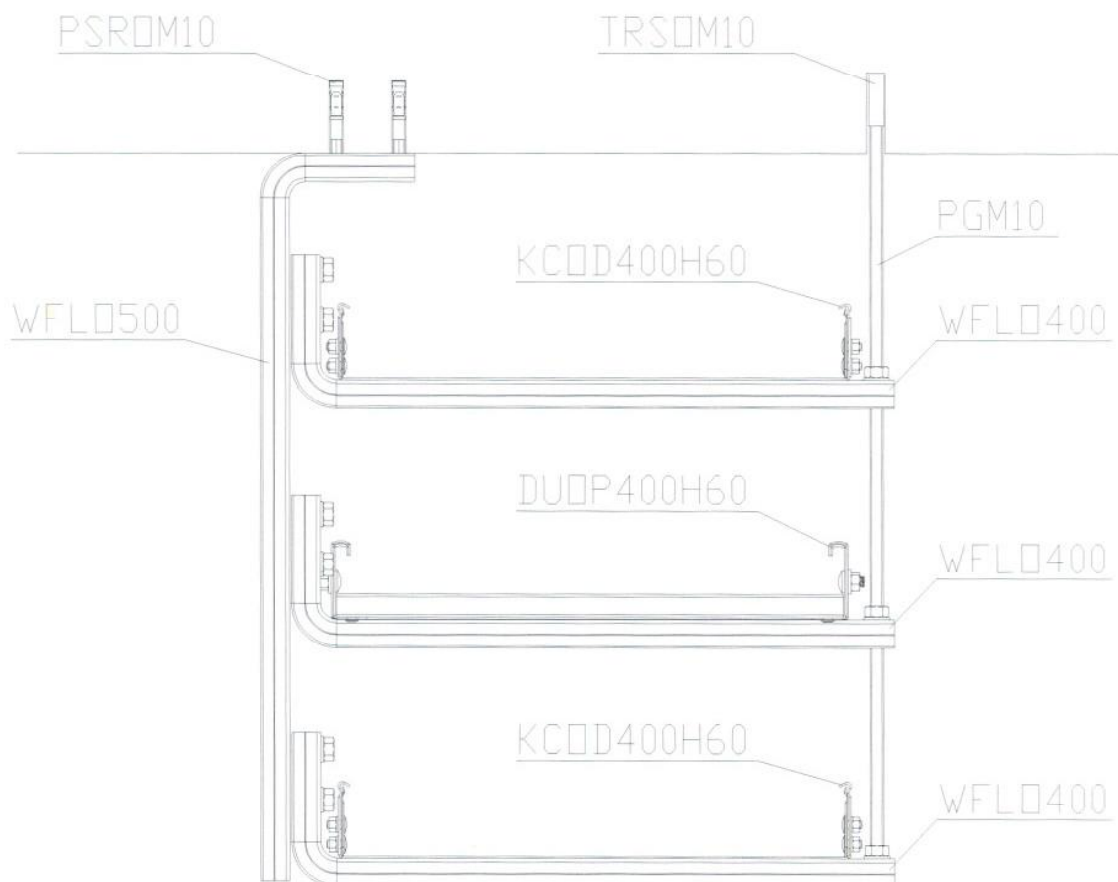
 FIRES S.R.O. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature 
Dokument č. / Document No. FIRES-FR-004-09-AXE	
Príloha č./Appendix No. 3A	

Materiał	Podzaj	Bl. kwasoodporna	Nazwa rysunku	Podziałka
	Gatunek	1.4401	Rysunek konstrukcja ceownik	1:1
	Nr normy	PN-EN 10088		
Profesjonalne Systemy Tras Kablowych			BAKS-TECHNOKABEL FIRES 12-16 01 2009rok	



 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature 
Dokument č./Document No. FIRES-FR-004-01-AWE	
Príloha č./Appendix No. 38	

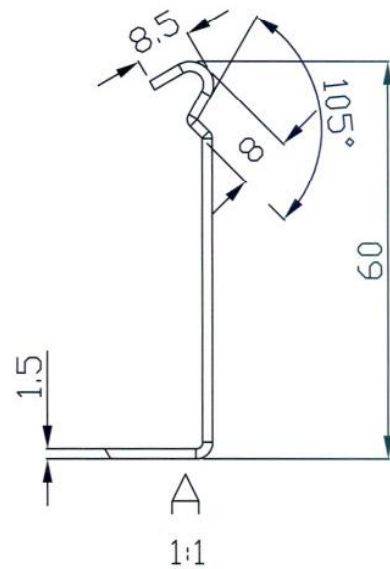
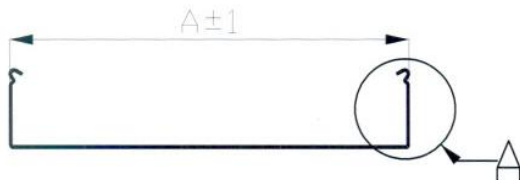
Materiál Podzoj Gatunek Nr normy	Bl. ocynkowana	Nazwa rysunku Rysunek konstrukcja WPCD	Podziałka 1:1
	Profesjonalne Systemy Tras Kablowych	BAKS-TECHNOKABEL FIRES 12-16 01 2009rok	



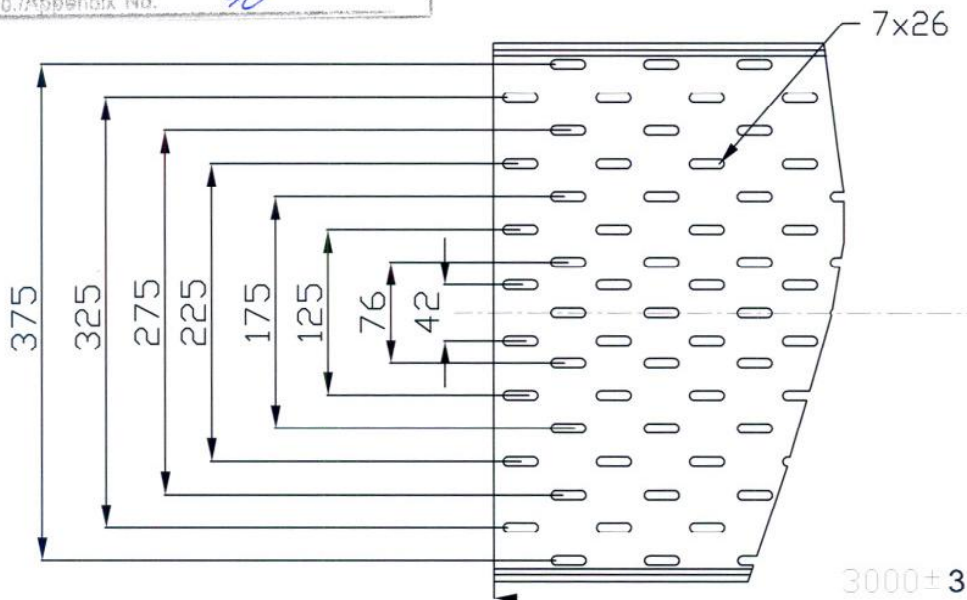
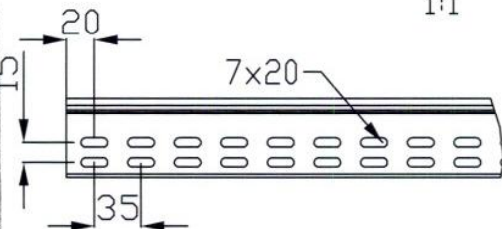
 FIRES S.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date <i>16. 01. 2009</i>
	Podpis/Signature <i>[Signature]</i>
	Dokument č. / Document No. <i>FIRES-FR-006-09-ANE</i>
Príloha č./Appendix No. <i>39</i>	

Materiál	Rodzej	<i>Bl. ocynkovaná</i>	Názov kresby <i>Rysunek konstrukcja WFLD</i>	Podziałka <i>1:1</i>
	Gatunek			
	Nr. normy			
Profesjonalne Systemy Tras Kablowych			BAKS-TECHNOKABEL FIRES 12-16 01 2009rok	

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

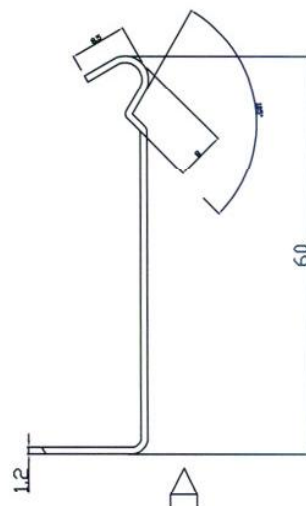
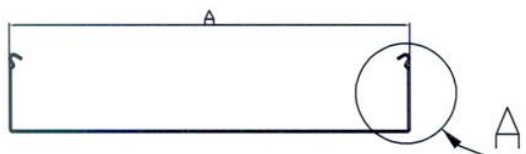


FIRES s.r.o. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>16.01.2024</i>
	Podpis/Signature <i>[Signature]</i>
	Dokument č. Document No. <i>FIRES-FR-004-09-PWE</i>
	Príloha č./Appendix Nb. <i>40</i>

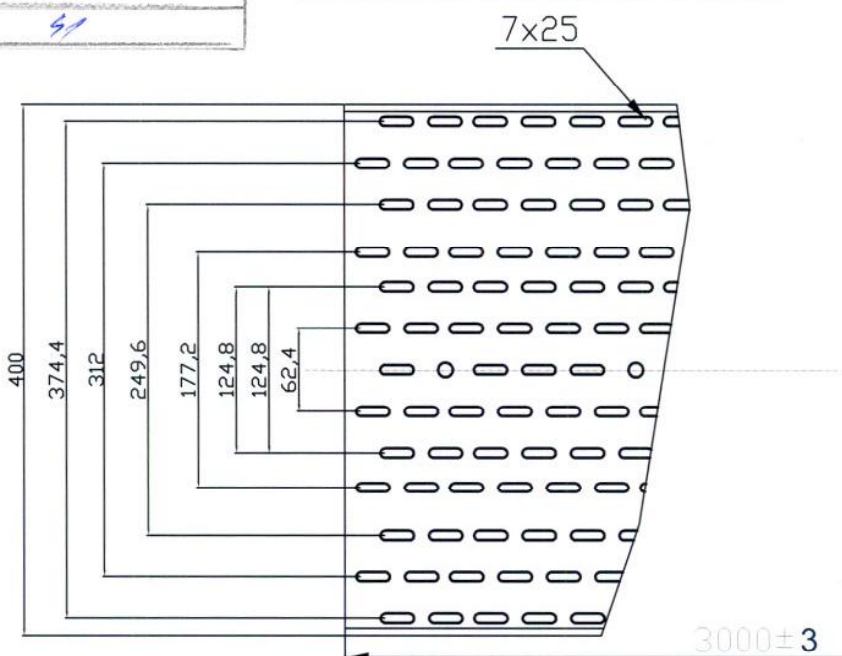
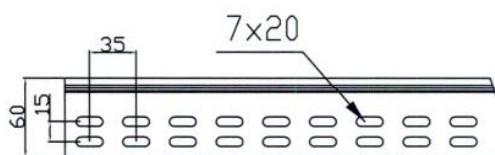


	Odchyłka wyniarów nietolerowanych	Materiał	Gatunek	Masa [kg]	Podziałka	Format A4									
			Nr normy			PN-EN 10142 + A1 : 1997	Arkusz								
		półfabrykat (nr normy)				Arkuszy									
Projektował	J.GROCHOWSKI	Data	20.10.05	Nazwa rysunku											
Rysował	J.Grochowski		20.10.05	KCDP400H60/3N											
Sprawdził	T.WŁODARCZYK		20.10.05												
Zatwierdził	JKLICZEK		20.10.05	Nr programu maszynowego											
Profesjonalne Systemy Tras Kablowych			Nr rysunku 862040		Nr zmiany										
					<table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table>										

A	Typ	Nr.kat
100	KCDD100H60/3N	
200	KCDD200H60/3N	
300	KCDD300H60/3N	
400	KCDD400H60/3N	

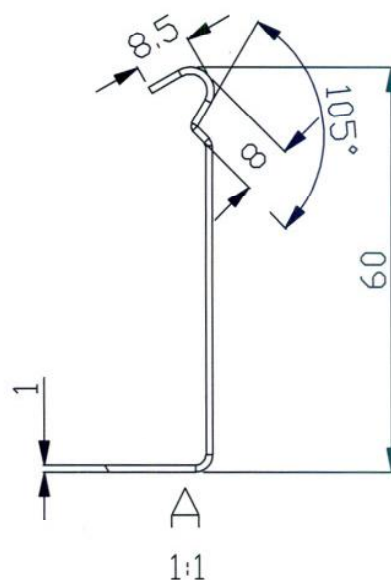
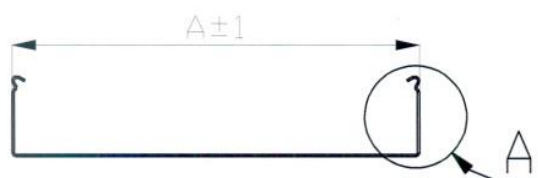


 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. Document No. <i>FIRES-FR-006-09 ANE</i>	
Príloha č./Appendix No. <i>51</i>	

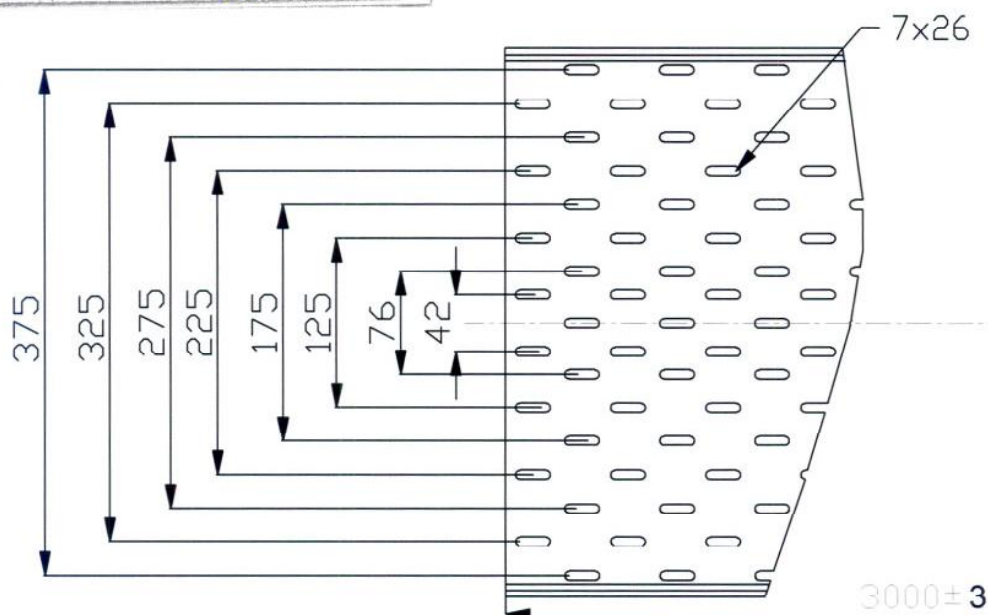
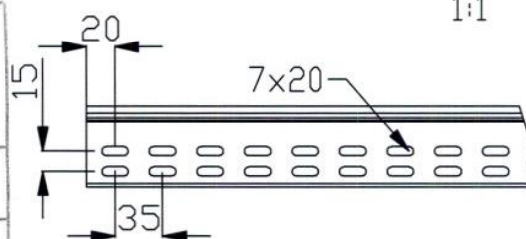


	Dachytka wymiarów nieolerowanych	Materiał	Gatunek	Masa [kg]	Podziałka	Format A4	
			Nr normy	PN-EN 10142 + A1 : 1997		Arkusz	
		półfabrykat (nr normy)				Arkuszy	
Projektował	J.GROCHOWSKI	Data	Nazwa rysunku				
Rysował	J.Grochowski		20.10.08	KCDD400H60/3N			
Sprawdził	T.WŁODARCZYK		20.10.08				
Zatwierdził	J.KLICZEK		20.10.08				
Profesjonalne Systemy Tras Kablowych			Nr programu maszynowego		Nr zmiany		
			Nr rysunku				

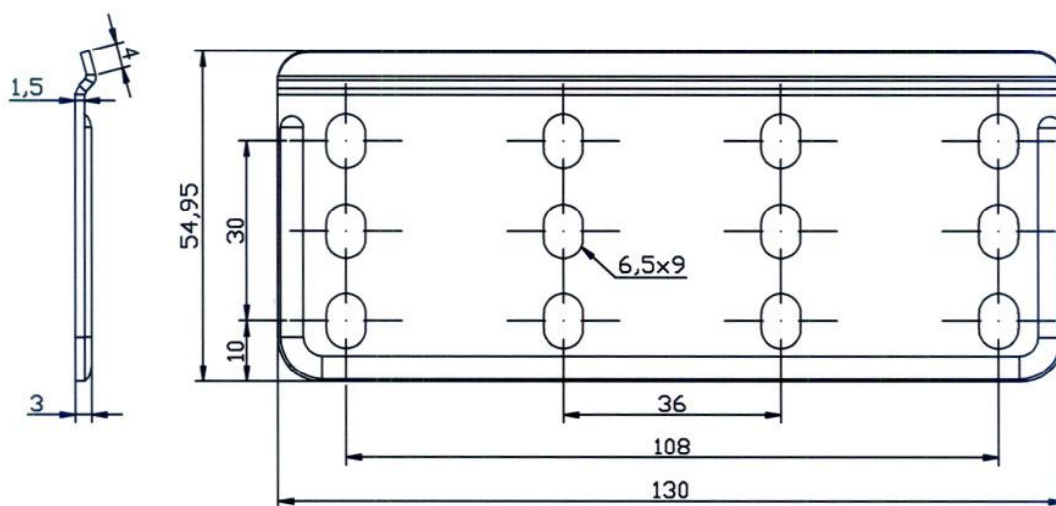
A	Typ	Nr.kat
100	KCQJ100H60/3N-E	
200	KCQJ200H60/3N-E	
300	KCQJ300H60/3N-E	
400	KCQJ400H60/3N-E	



 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>[Signature]</i>
	Dokument č. Document No. <i>FIRES-FR-009-09-AWE</i>
	Příloha č./Appendix No. <i>42</i>

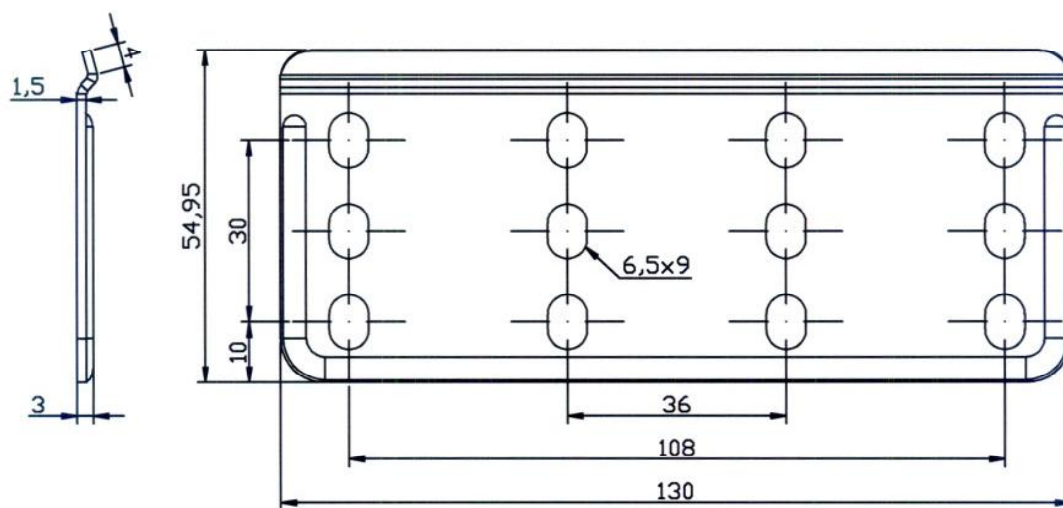


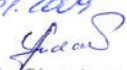
	Długość wymiarów niezgodności	Projektował Rysował Sprawdził Zatwierdził	J.GROCHOWSKI J.Grochowski T.WŁODARCZYK J.KLICZEK	Podpis _____ _____ _____ _____	Materiał Gatunek Nr normy półfabrykat (nr normy)	gat. 1.4... EN 10088	Masa [kg]	Podziałka	Format A4 Arkusz Arkuszy
Data 20.10.05 20.10.05 20.10.05 20.10.05					Nr programu maszynowego				
Nr rysunku					Nr zmiany				
 Profesjonalne Systemy Tras Kablowych									

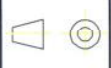


 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>J. Grochowski</i>
Dokument č. / Document No. <i>FIRES-FR-004-09-DWE</i>	
Príloha č./Appendix No. <i>43</i>	

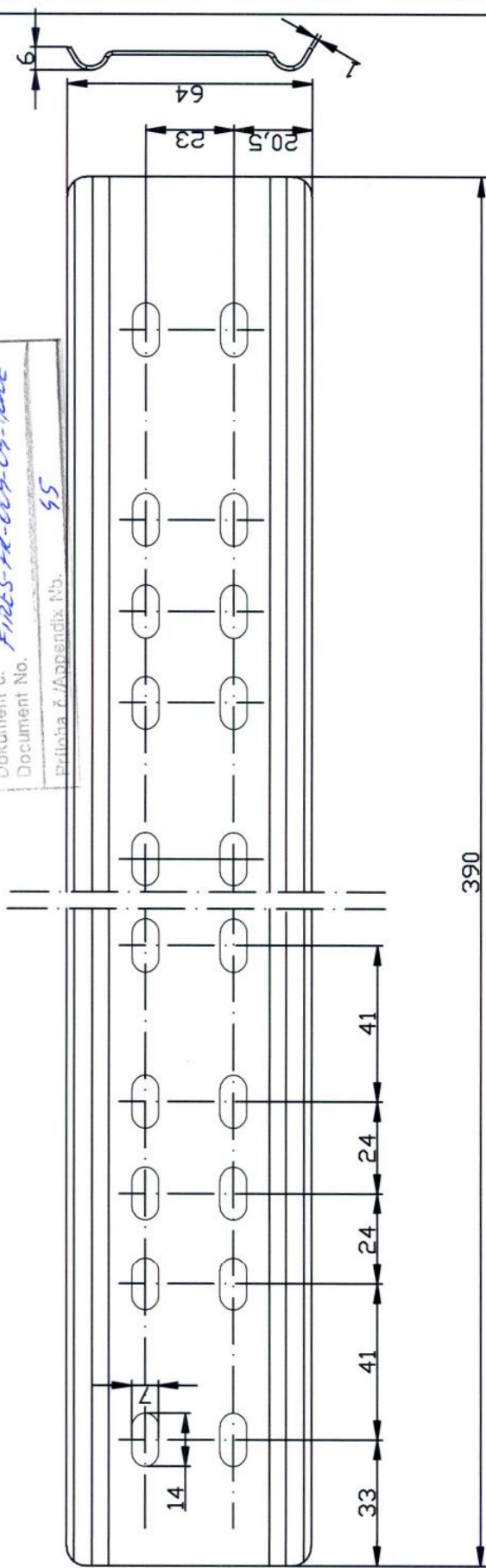
	Dichytka výkonnosť netolerovaných		Materiál	Gatunek <i>Blacha stal.cynknet.Sędzinira</i>	Masa [kg]	Podziałka	Format A4	
				Nr normy <i>PN-EN 10327/2005</i>				0,09
				półfabrykat (nr normy)				
Projektant	J.GROCHOWSKI	Podpis	Data	Nazwa rysunku <i>L P O P H 6 0 N</i>				
Rysował	J.Grochowski							
Sprawił	T.WŁODARCZYK							
Zatwierdził	J.KLICZEK							
Profesjonalne Systemy Tras Kablowych				Nr rysunku	860700			Nr zmiany



 FIRES s.r.o. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Datum/Date 16.01.2009
	Podpis/Signature 
Dokument č. / Document No. FIRES-FR-009-09-AWE	
Příloha č. / Appendix No. 44	

	Odchyłka wymiarów nie tolerowanych	Materiał	Gatunek Blacha stalocynk.net.Sędzinira	Masa [kg] 0,09	Podziałka 1:1	Format A4
			Nr normy PN-EN 10327:2005	półfabrykat (nr normy)	Artykuł	Artykuł
Projektował J.GROCHOWSKI	Nazwa	Podpis	Data 20.10.05	Nazwa rysunku		
Rysował J.Grochowski			Data 20.10.05	LPOPH60E		
Sprawdził T.WŁODARCZYK			Data 20.10.05			
Zatwierdził J.KLICZEK			Data 20.10.05			
Profesjonalne Systemy Tras Kablowych			Nr rysunku 861200	Nr zleń		

 FIRE s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>[Signature]</i>
Dokument č. <i>FIRE-FR-024-09-AUE</i>	
Document No.	
Priloha č./Appendix No. <i>95</i>	



	Długość wymiarów nie tolerowanych	Gatunek Nr normy PN-EN 10327:2005	Blacha stal.cynk.met.Sędzimira PN-EN 10327:2005	Masa [kg] 0,24	Podziałka 1:1	Format A3
Projektował J.GROCHOWSKI	Nazwisko J.GROCHOWSKI	Data 20.10.05	Materiał 20.10.05	Podpis J.KLICZEK	Nr rysunku 862440	Nr zmiany
Rysował T.WŁODARCZYK	J.KLICZEK	20.10.05	20.10.05	20.10.05	Blacha łącznikowa	
Sprawdził						
Zatwierdził						



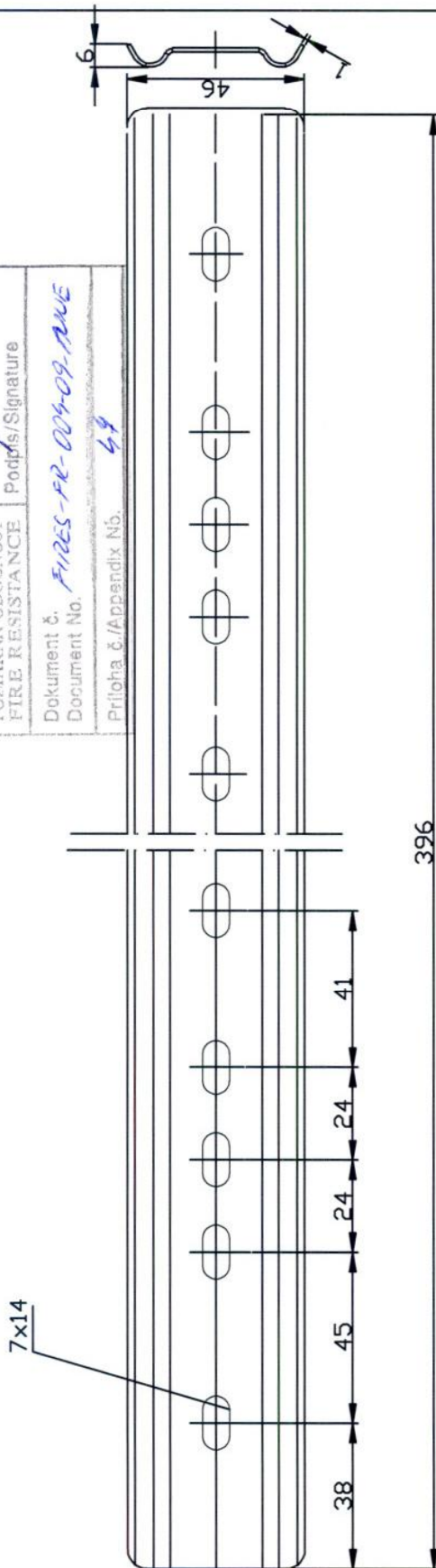
Profesjonalne Systemy
Tras Kablowych

Document No. _____
 Priloha č./Appendix N^o. **96**

64
 20.5
 23
 6
 390
 33
 41
 24
 24
 24
 41
 14
 7

	Długość wymiary nie tolerowanych		Materiał Gatunek Nr normy półfabrykat (nr normy)	Blacha kwasoodporna 0H18N9	Masa [kg] 0,24	Podziałka 1:1	Format A3
							Arkusz Arkuszy
Projektował	Nazwisko J.GROCHOWSKI	Podpis	Data 20.10.05	Nazwa rysunku Blacha łącznikowa		Nr zmiany	
Rysował	J.Grochowski		20.10.05				
Sprawdził	T.WŁODARCZYK		20.10.05				
Zatwierdził	J.KLICZEK		20.10.05	Nr rysunku 861140		Profesjonalne Systemy Tras Kablowych	

 FIRES s.r.o. POŽIARNÁ ODOLNOSŤ FIRE RESISTANCE	Dátum/Dale <i>16.01.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. <i>FIRES-FR-004-09-AME</i>	
Document No.	
Príloha č./Appendix No. <i>49</i>	



	Długość wymiarów nieolerowanych	J.GROCHOŃSKI J.Grochowski T.WŁODARCZYK JKLICZEK	Podpis	Data	Gatunek Nr normy półfabrykat (nr normy)	Masa [kg] 0,16	Podziałka 1:1	Format A3 Arkusz Arkusz
Projektował	Nazwa rysunku BZK□400N							
Rysował	Blacha zakończeniowa							
Sprawdził	Nr rysunku 862540							
Zatwierdził	Profesjonalne Systemy Trasy Kablowych							

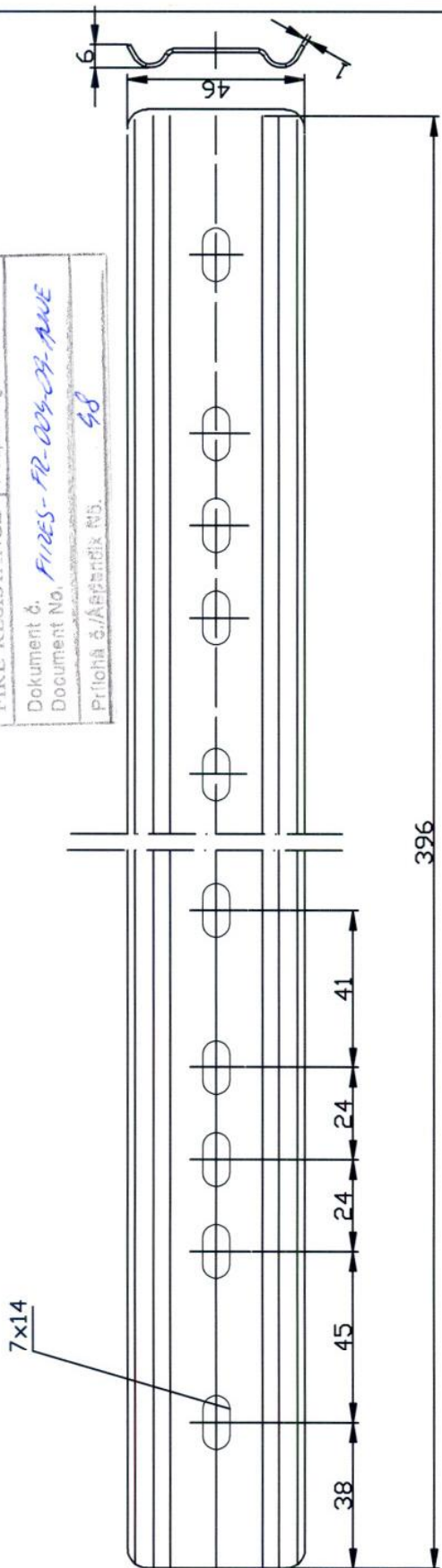
FIRES s.r.o.
POŽIARNA ODOLNOST
FIRE RESISTANCE

Dátum/Date
16.01.2009

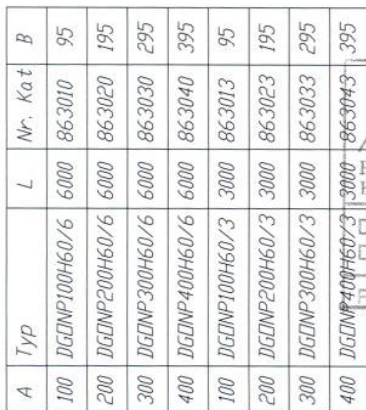
Podpis/Signature
[Signature]

Dokument č. *FIRES-FR-004-09-ANE*
Document No.

Príloha č./Appendix N3. *48*



	Długość wymiarów niezależnych	Nazwa rysunku BZK 400E	Masa [kg] 0,16	Podziałka 1:1	Format A3
Projektował J. GROCHOWSKI	Data 20.10.05	Nazwa rysunku BZK 400E	Masa [kg] 0,16	Podziałka 1:1	Format A3
Rysował J. Grochowski	Podpis J. Grochowski	Nazwa rysunku BZK 400E	Masa [kg] 0,16	Podziałka 1:1	Format A3
Sprawdził T. WŁODARCZYK	Podpis T. Włodarczyk	Nazwa rysunku BZK 400E	Masa [kg] 0,16	Podziałka 1:1	Format A3
Zatwierdził J. KLICZEK	Podpis J. Kliczek	Nazwa rysunku BZK 400E	Masa [kg] 0,16	Podziałka 1:1	Format A3
Profesjonalne Systemy Tras Kablowych			Nr rysunku 862640		
Nr zmiany 1			Nr zmiany 1		

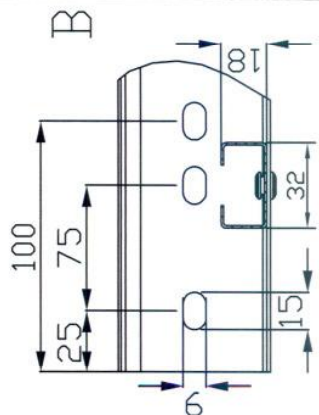


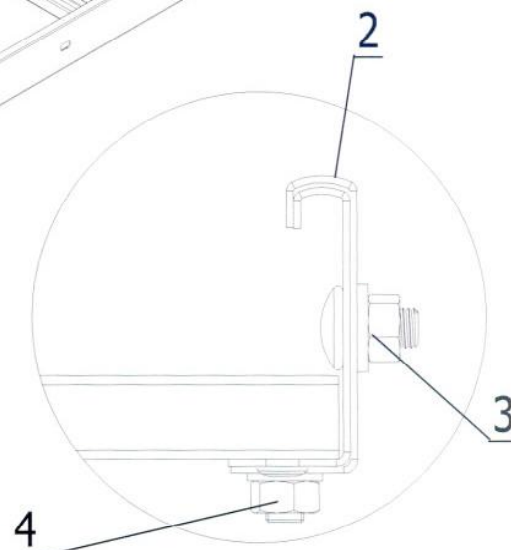
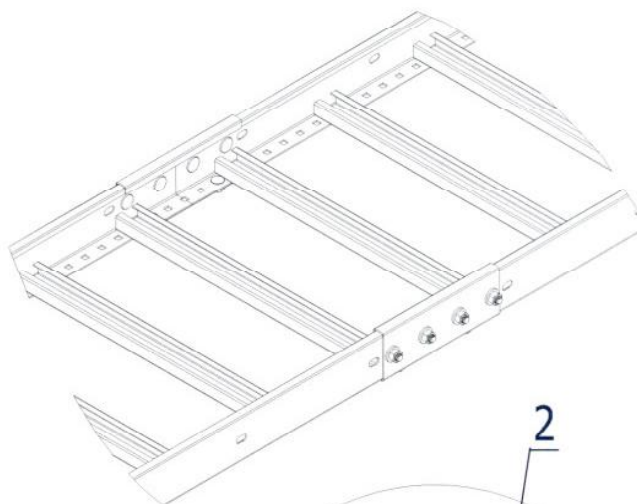
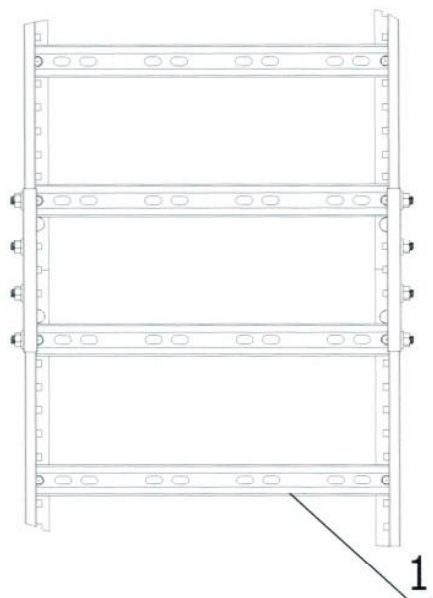
A	T _{yp}	L	Nr. Kat	B
100	DGPNP100H60/6	6000	86.3010	95
200	DGPNP200H60/6	6000	86.3020	195
300	DGPNP300H60/6	6000	86.3030	295
400	DGPNP400H60/6	6000	86.3040	395
100	DGPNP100H60/3	3000	86.3013	95
200	DGPNP200H60/3	3000	86.3023	195
300	DGPNP300H60/3	3000	86.3033	295
400	DGPNP400H60/3	3000	86.3043	395

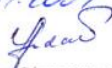
[illegible]

Profesjonalne Systemy Tras Kablowych

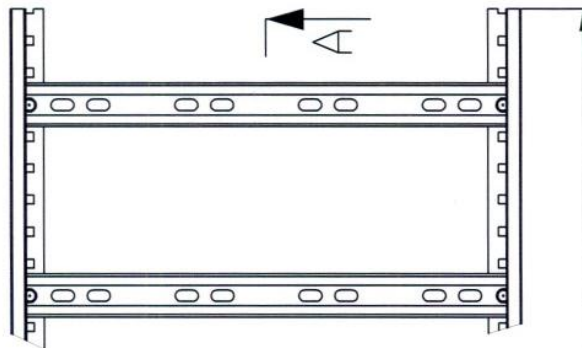
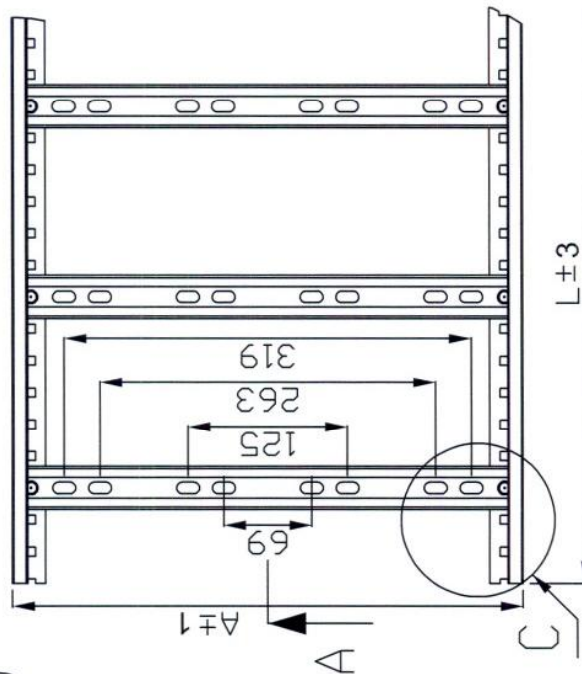
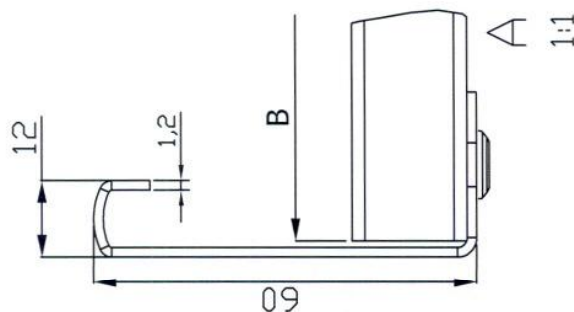
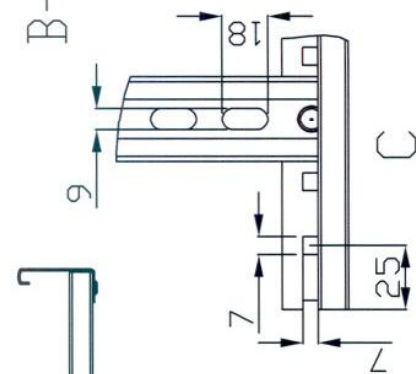
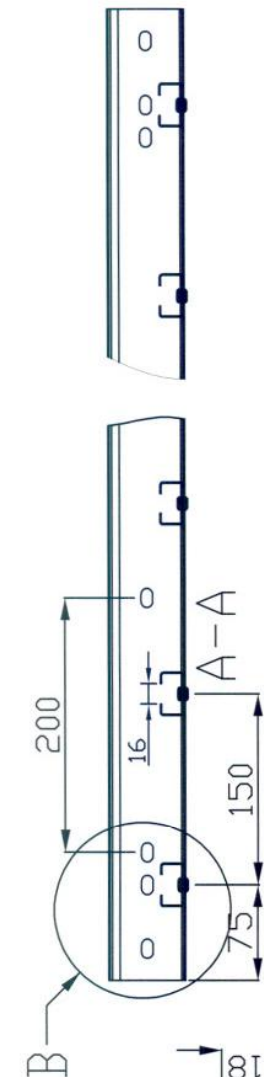
 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date <i>16. 01. 2009</i> <i>J. Jandaš</i> Podpis/Signature
Dokument č. Document No.	<i>FIRES-FR-004-09-AME</i>
Príloha č./Appendix No.	<i>69</i>





 FIRES s.r.o. POZIARNA ODOLNOST' FIRE RESISTANCE	Datum/Date 16.01.2009 Podpis/Signature 
	Dokument č. Document No. FIRES-PR-004-09-AWE
Příloha č./Appendix No. 50	

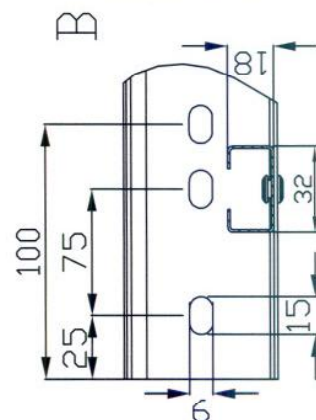
4	śruba	SGN M6x12		4	650442		
3	śruba	SGN M8x14		8	650142		
2	łącznik	LDDNCH60		2	863000		
1	DRABINKA	DGONP400H60		1	863043		
Pos.	Benennung	Zeichnung-Nr	Material	Stck.	Katalogs Nr.		
	Dłchylka wyniarów nietolerowanych	Materiał	Gatunek	Masa (kg)	Podziałka	Format	
			Nr normy				PN-EN 10327:2005
			polifabrykat (nr normy)				
					7,50	A4	
						Arkusz	
						Arkuszy	
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku			
Rysował							
Sprawdził							
Zatwierdził							
				Nr programu maszynowego			
				Nr rysunku			
				Nr. zmiany			



A	Typ	L	Nr. Kat	B
100	DGDD100H60/6N	6000		95
200	DGDD200H60/6N	6000		195
300	DGDD300H60/6N	6000		295
400	DGDD400H60/6N	6000		395
100	DGDD100H60/3N	3000		95
200	DGDD200H60/3N	3000		195
300	DGDD300H60/3N	3000		295
400	DGDD400H60/3N	3000		395

FIRES S.R.O.
POZIARNA ODOLNOŚĆ
FIRE RESISTANCE

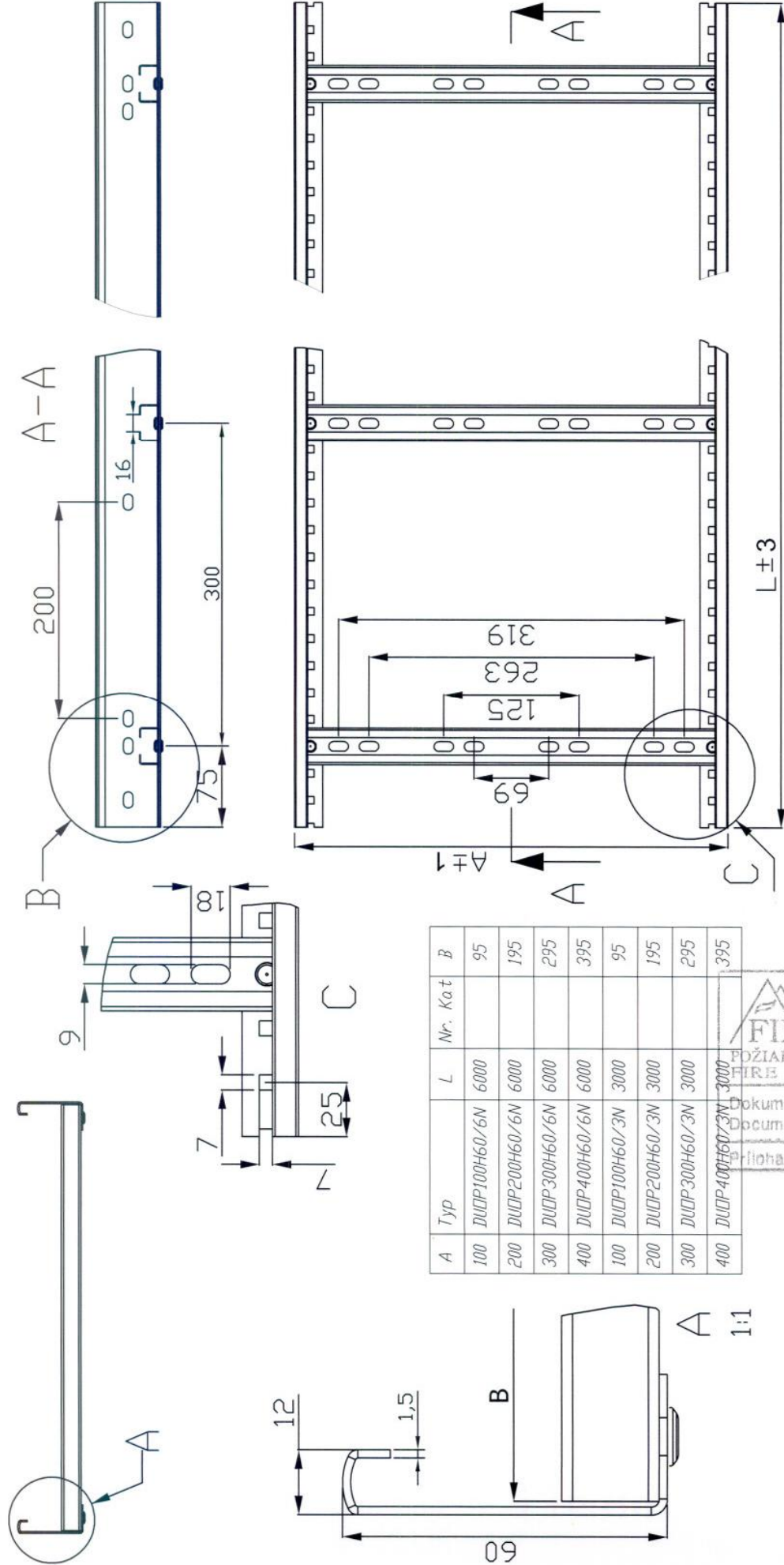
Dokument č. / Document No. **FIRES-FR-004-09-AWE**
Příloha č./Appendix No. **57**



Dřívky výrobce ne tolerovaných	Gatunek Nr normy półfabrykat (nr normy)	Masa kg	Podziałka	ornat Afusz Afusz
Projektant Rysował Sprawdził Zatwierdził	Nazwa rysunku	Data	Podpis	Nr zmiany
J.GROCHOWSKI		20.10.05		
J.Grochowski		20.10.05		
T.WLODARCZYK		20.10.05		
JKLICZEK		20.10.05		
Nazwa rysunku		DGDD400H60/3N		
Data		20.10.05		
Podpis		---		
Zatwierdził		---		
Nazwa rysunku		---		
Data		---		
Podpis		---		
Zatwierdził		---		



Profesjonalne Systemy Tras Kablowych



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

FIRES s.r.o.
POŻIARNA ODOLNOŚĆ
FIRE RESISTANCE

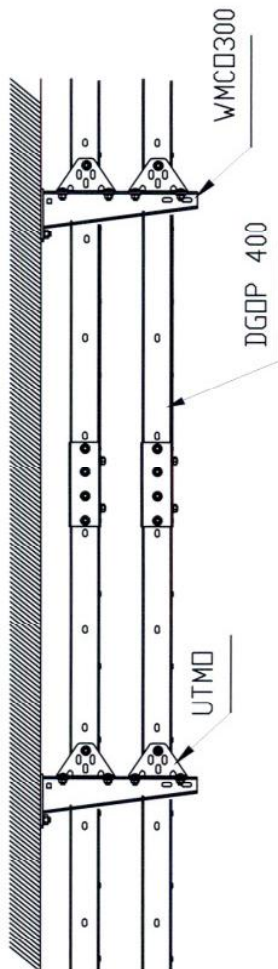
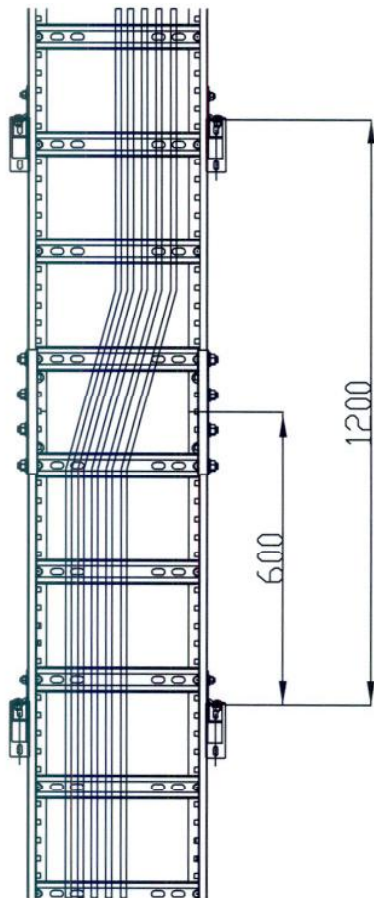
Dokument č. / Document No. **FIRES-FR-004-09-NNE**
Príloha č./Appendix Nb. **52**

Dátum/Date **16.01.2009**
Podpis/Signature **J. J. J.**

Dachyčka výhledem nietolerovaných	Gatunek	Masa (kg)	Podziałka	ornat
	Nr normy			ARKUSZ
Nozisko	półfabrykat (nr normy)			ARKUSZY
Projektant	J. GROCHOWSKI	Nazwa rysunku		
Rysował	J. Grochowski	DUPP400H60/3N		
Sprawdził	T. WLODARCZYK			
Zatwierdził	J. KŁICZEK			
		Nr programu		
		Na szarym		
		Nr zmiany		

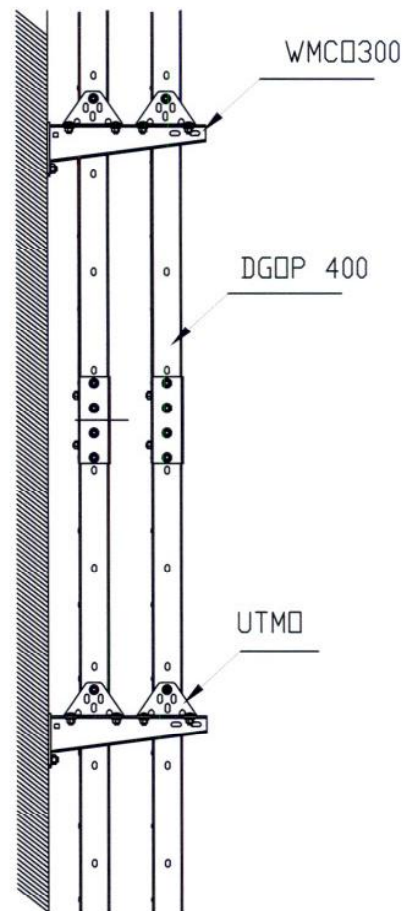
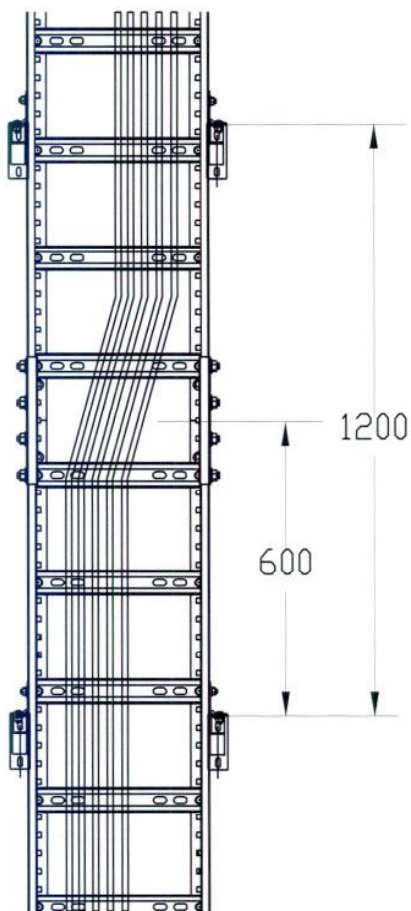


BAKSIES JONALNE SYSTEMY TRAS KABLOWYCH



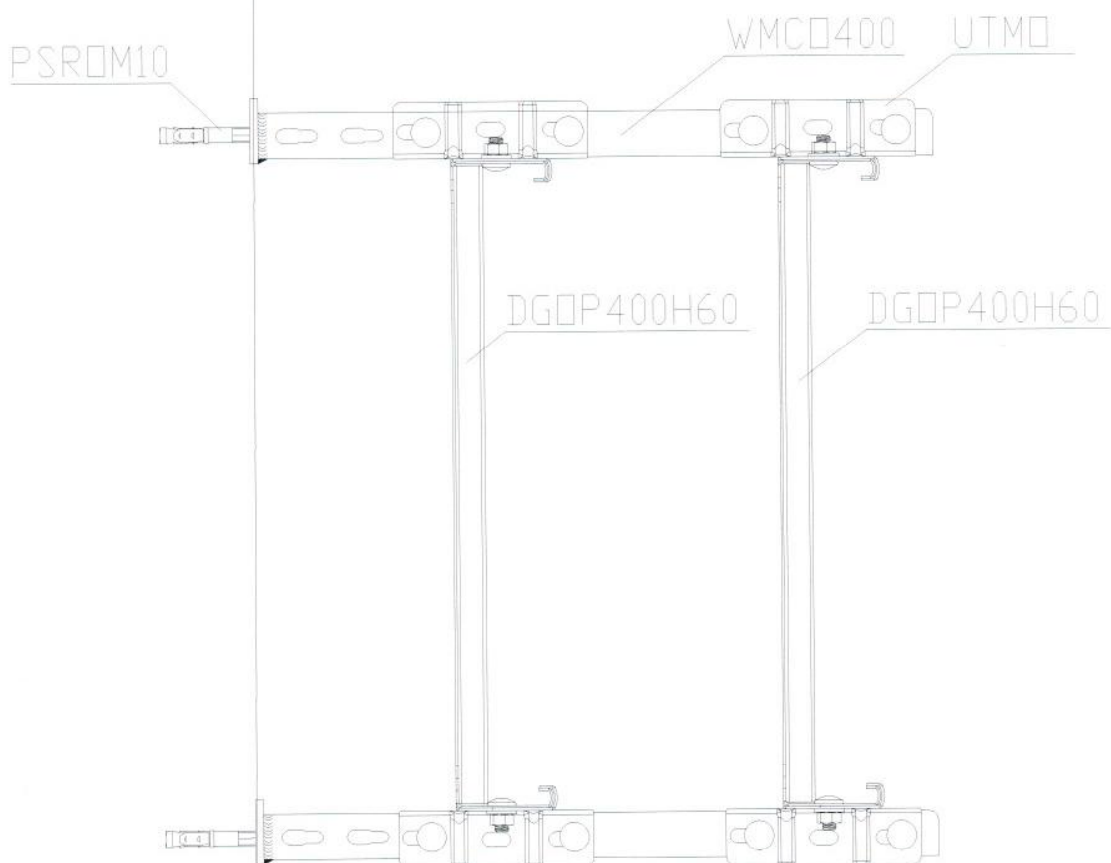
Dokumentacja wykonawcza niezawieszająca		Gatunek Nr normy półfabrykat (nr normy)		Masa [kg]		Podziałka		Format Arkusz Arkuszy	
				PN-EN 10327:2005				A4 3 5	
Projektował		Data		Nazwa rysunku					
Rysował		Podpis							
Sprawdził		Jędrzejowski							
Zatwierdził		Nozwicko							
		Profesjonalne Systemy Tras Kablowych		Nr programu maszynowego		Nr rysunku		Nr zmiany	

FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE		Dátum/Date 16.01.2009 Podpis/Signature 	
Dokument č. FIRES-FR-006-09-AVE Document No.		Priloha č./Appendix Nb. 53	



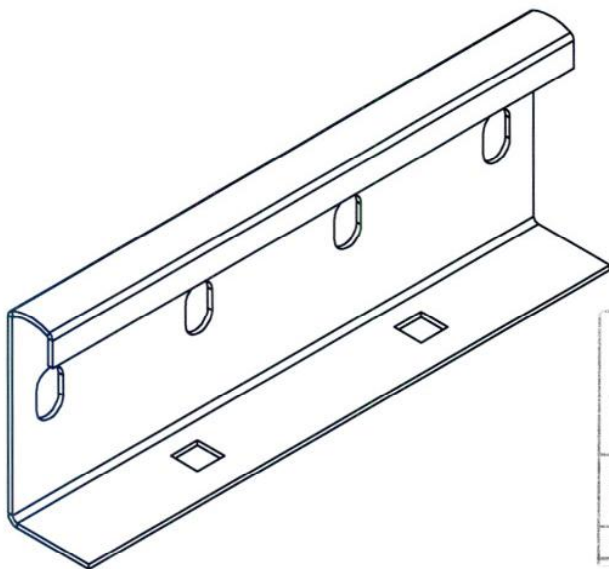
 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>16. 01. 2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. <i>FIRES-FR-009-09-ANNE</i>	
Príloha č./Appendix No. <i>54</i>	

	Długość wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	Format
				Nr normy	PN-EN 10327:2005			Arkusz
				polifabrykat (nr normy)				Arkuszy
								A4
								3
								5
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku				
Rysował								
Sprawdził								
Zatwierdził								
				Nr programu maszynowego	Nr zmiany			
				Nr rysunku				
Profesjonalne Systemy Tras Kablowych								

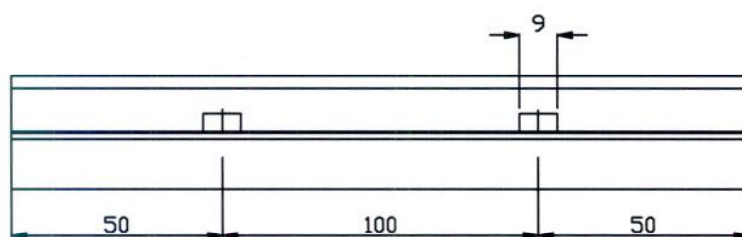
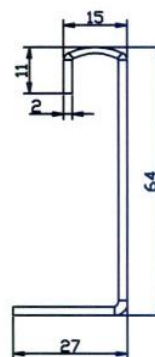
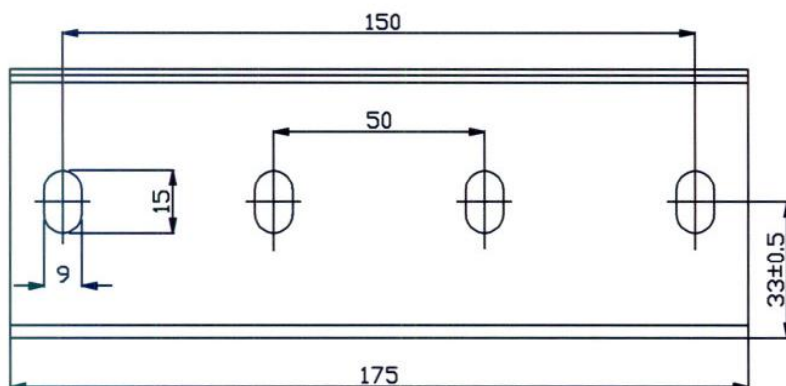


 FIRES s.r.o. POŽIARNÁ ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 16. 01. 2009
	Podpis/Signature 
Dokument č./Document No. FIRES-FR-004-09-AME	
Príloha č./Appendix No. 55	

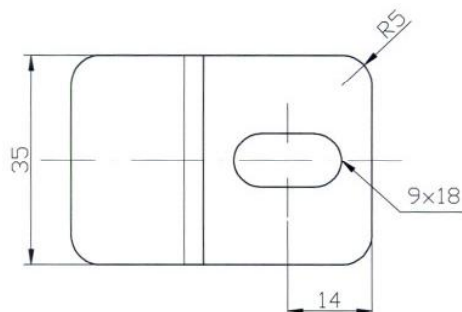
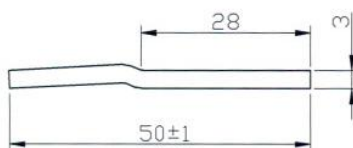
Materiál Rodzaj Gatunek Nr normy	Bl. ocynkowana	Nazwa rysunku Rysunek konstrukcja drabinka	Podziałka 1:1
Profesjonalne Systemy Tras Kablowych		BAKS-TECHNOKABEL FIRES 12-16 01 2009rok	



 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date <i>16. 01. 2009</i>
	Podpis/Signature <i>Jolana</i>
Dokument č. <i>FIRES-FR-004-09-ANNE</i> Document No.	
Príloha č./Appendix No. <i>56</i>	

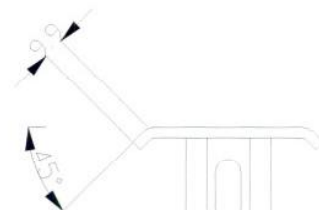
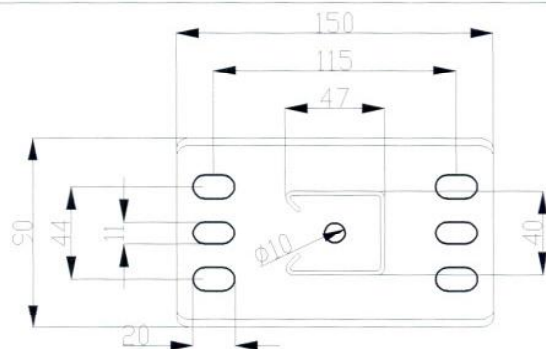


	Dokladka (výkres) nie tolerovaných		Materiál G3000 Nr normy PN-EN 10327:2005 pôdfabrikat (nr normy)	Hmotnosť (kg) Podzielik	Formát A4 Kúsok Kúsok
	Projektant	J.GROCHOVSKI			
Rysoval	J.Grochowski	Podpis	20.10.05	Nazwa rysunku L DCH60N	
Sprawdzil	T.WLODARCZYK	20.10.05			
Zatwierdził	J.KLICZEK	20.10.05	Nr rysunku		Nr zmiany
 Profesjonalne Systemy Tras Kablowych				863000	



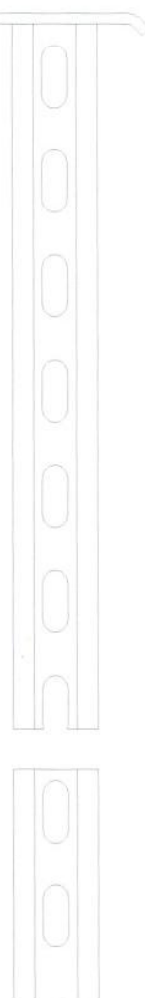
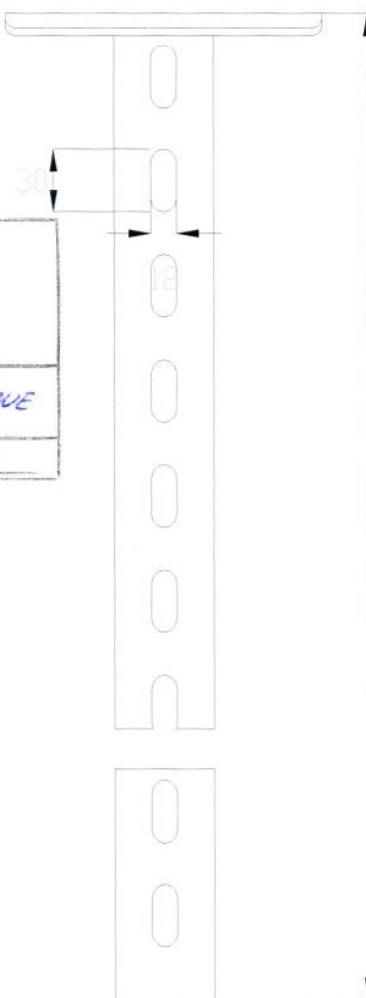
 FIRES S.T.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date <i>16.01.2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. <i>FIRES-FR-004-09-AVNE</i> Document No.	
Príloha č./Appendix N5. <i>54</i>	

	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 --
Projektował	Tomasz Grudniński	Data 29.12.04 20.02.08 20.02.08 20.02.08	Nazwa rysunku <i>ZMO</i>	Nr rysunku <i>802900</i>	Nr zmiany 	
Rysował	Jakub Rudak					
Sprawdził	Jacek Kliczek					
Zatwierdził	Jacek Kliczek					
 Profesjonalne Systemy Tras Kablowych						

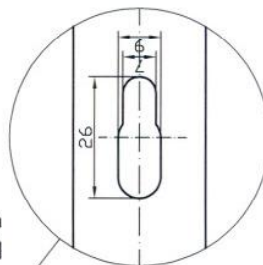
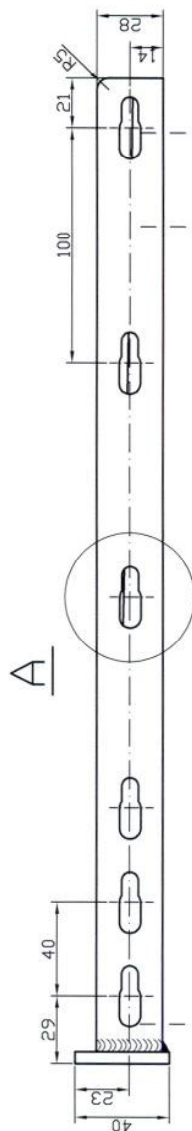
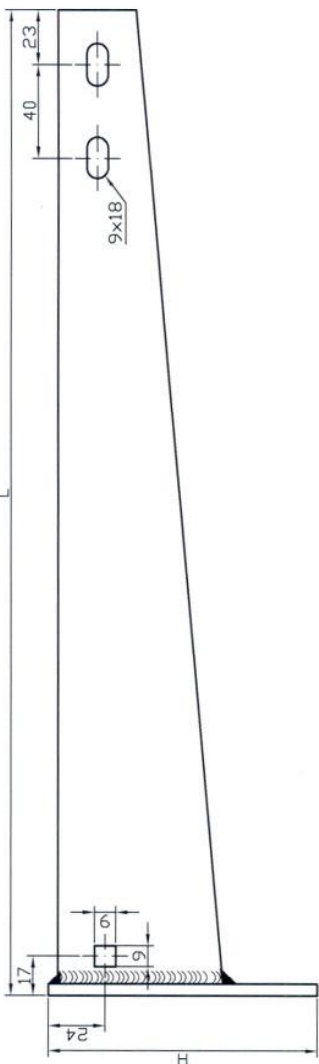


 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date <i>16. 01. 2009</i>
	Podpis/Signature <i>[Signature]</i>
Dokument č. / Document No. <i>FIRES-FR-004-09-AWE</i>	
Príloha č./Appendix No. <i>58</i>	

L	Typ	Nr.kat
200	WPCD200	800820
300	WPCD300	800830
400	WPCD400	800840
500	WPCD500	800850
600	WPCD600	800860
700	WPCD700	800870
800	WPCD800	800880
900	WPCD900	800890
1000	WPCD1000	800900

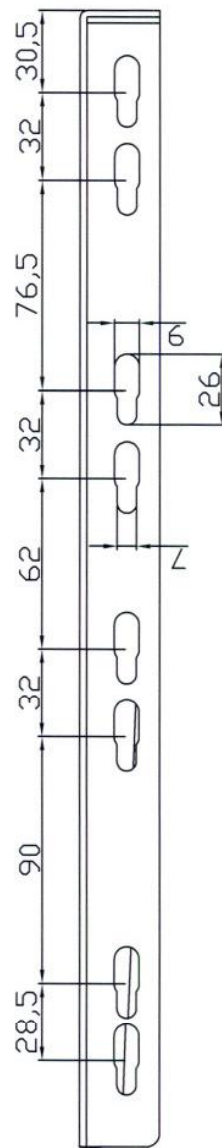


 Dýchadlo výfukový netolerovaných	T. Grudniewski T. Grudniewski J. Kliczek J. Kliczek	Podpis _____ _____ _____ _____	Materiál Gotunek Nr. normy półfabrykat (nr. normy)	Waga [kg] --	Podziałka 1:3	Format A4 Arkusz 1 Arkuszy 1
			Data 03.17.04 03.17.04 03.17.04 03.17.04	Nazwa rysunku WPCD Nr programu maszynowego --- Nr rysunku	Nr zmiany _____ _____ _____	
Projektował Rysował Sprawdził Zatwierdził			Profesjonalne Systemy Tras Kablowych			



	Dátum/Date 16.01.2009
POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Podpis/Signature
Dokument č. FIRES-FR-005-03-AN-E Document No. Príloha č./Appendix No. 59	



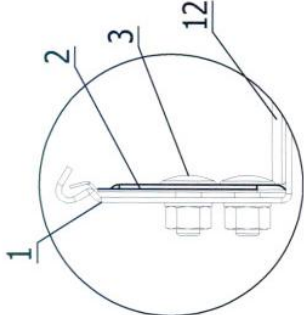
<i>A</i>	<i>Typ</i>	<i>Nr.kot</i>
115	WWS□ 100	
215	WWS□ 200	
315	WWS□ 300	
415	WWS□ 400	

 FIRES S.T.O. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date <i>16.01.2009</i> Podpis/Signature <i>J. János</i>	Dokument č. <i>FIRE-PR-MK-08-AWE</i> Document No.	Príloha č./Appendix No. <i>60</i>
---	---	--	--

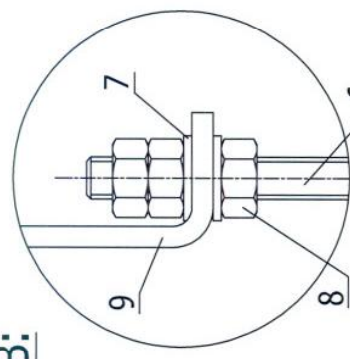
[illegible]

D-D

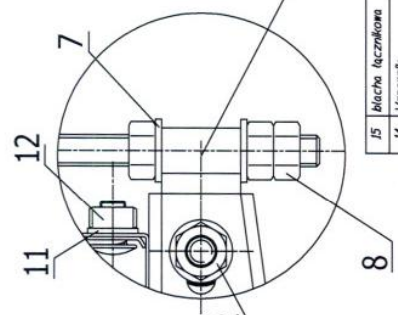
A:



B:



C:



10:11:12

D

D

D

B

A

3; 11; 12

C

4

13

FIRES S.R.O.
POZIARNA ODOLNOST
FIRE RESISTANCE

Dátum/Date: 16.01.2009
Podpis/Signature: [Signature]

Dokument č. FIZES-FR-006-09-ANE
Document No. 67

Pos.	Benennung	Zeichnung-Nr.	Material	Stück	Katalogs Nr.
15	blacha łącznikowa	BLN400		1	862440
14	Wspornik	WPCJ		1	800830
8	śruba	SN M10x30		2	650843
12	nakrętka	NS M8		16	650144
11	podkładka	PP 8		16	650444
10	śruba	SN M6x16		2	650443
9	uchwyt sufitowy	USDV		1	803700
8	nakrętka	NS M10		8	650244
7	podkładka	PP 10		8	650544
6	pret gwintowany	POMIL J		1	651001
5	uchwyt	UPWJ		1	803300
4	wysięgnak	WNCD400	PA-13 100 H40W	1	800340
3	śruba	SN M6x12		14	650641
2	łacznik	LPCNP400		2	860700
1	koryto	KCDNP400H60/3	PA-13 100 H40W	1	862040

A	Typ	Poz.1	Poz.4
100	KCDNP100H60/3	WNCD100	WNCD100
200	KCDNP200H60/3	WNCD200	WNCD200
300	KCDNP300H60/3	WNCD300	WNCD300
400	KCDNP400H60/3	WNCD400	WNCD400



BAKS
DZIAŁ KONSTRUKCYJNY
ul. Jagodne 5 05-480
Korczew

FINNE KCDNP300H60/2 + AUSLEGER

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.

D-D

14; 9; 8

11; 12; 13

D

15

B

C

11; 12; 13

A

C

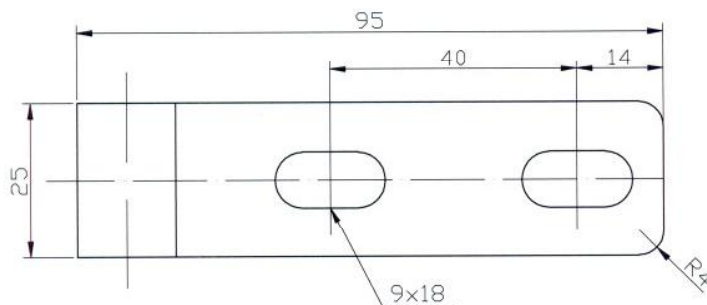
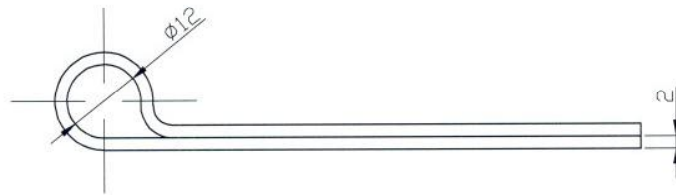
A:

B:

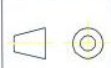
 FIRES S.r.o. POŽIARNÁ ODOLNOST FIRE RESISTANCE		Dátum/Date <i>6.01.2009</i> Podpis/Signature <i>[Signature]</i>
Dokument č. <i>FIRES-FR-004-09-ANF</i> Document No.		
Príloha č./Appendix No. <i>62</i>		

15	esponnik	WPCD	1	800840
13	šruba	SM M10x20	2	650843
12	matrečia	NS M8	8	650144
11	podkladica	PP B	8	650444
10	šruba	SGM8x16	4	650443
9	uchyt s uťahov	USDV	1	803700
8	matrečia	NS M10	8	650244
7	pret gntovany	PGM10_1	1	651001
6	uchyt	UPWJ	1	803300
5	zaciak nacujacy	ZND	2	802900
4	vyslegrik	WMC2400	1	800340
3	šruba	SG M8x14	4	650142
2	lacznik	LJDNCH60	2	863000
1	drabinka	LDGNP400060	1	863043
Pos.	Benennung	Zeichnung-Nr.	Material	Katalogs-Nr.
gekonstruier	konstruier	021106		
gezeichnet	gezeichnet	021106		
gepruft	gepruft	021106		
Ausst.ub				
15	LEITER INP400060/2 + AUSLEGER WMC	Fire		
Blatt 1 von 1 Grösse A3 Name: Feuerbestandig System BAKS DZIAL KONSURUKCYJNY ul. Jagodze 5 05-480 Karcew Vorhaben-forschern				

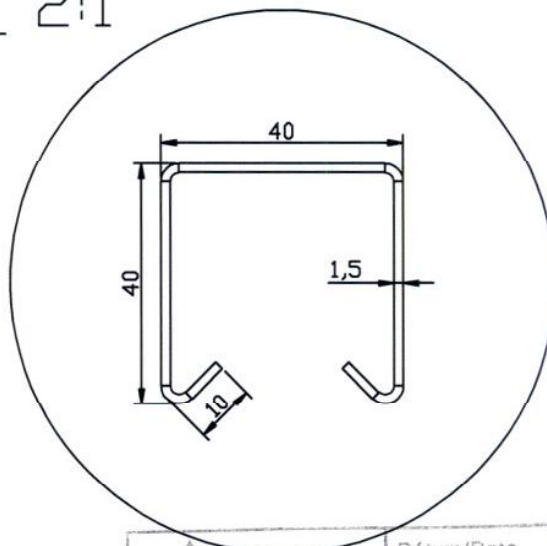
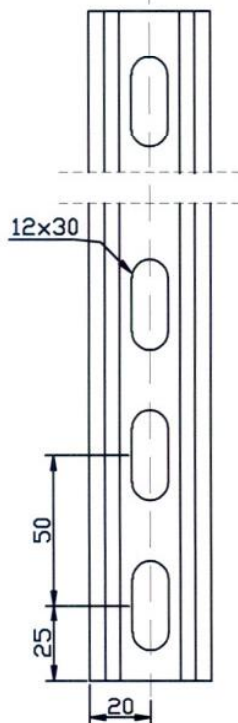
This drawing and its contents is the property of the BAKS company and may not be copied or otherwise disclosed to any third party without our consent. Contraventions will be prosecuted.



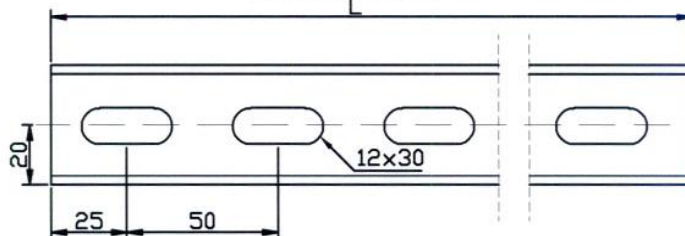
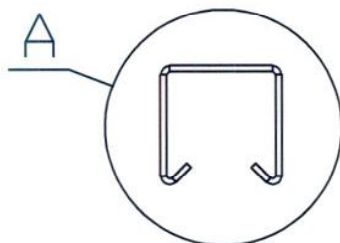
 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>Jacek</i>
Dokument č. Document No. <i>FIRES-FR-004-09-ANNE</i>	
Príloha č./Appendix No. <i>63</i>	

	Odchyłka wyniarów nietolerowanych	±0,5	Materiał Gatunek Nr normy półfabrykat (nr normy)	----- PN-EN 10327:2005 -----	Masa [kg] ---	Podziałka 1:1	Format A4 Arkusz -- Arkuszy --								
	Projektował	Jacek Grochowski		12.02.04	Nazwa rysunku UPW□										
Rysował	Jakub Rudak	20.02.08	Nr rysunku 803300												
Sprawdził	Jacek Kliček	20.02.08													
Zatwierdził	Jacek Kliček	20.02.08													
 Profesjonalne Systemy Tras Kablowych			Nr zmian <table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table>												

A 2:1

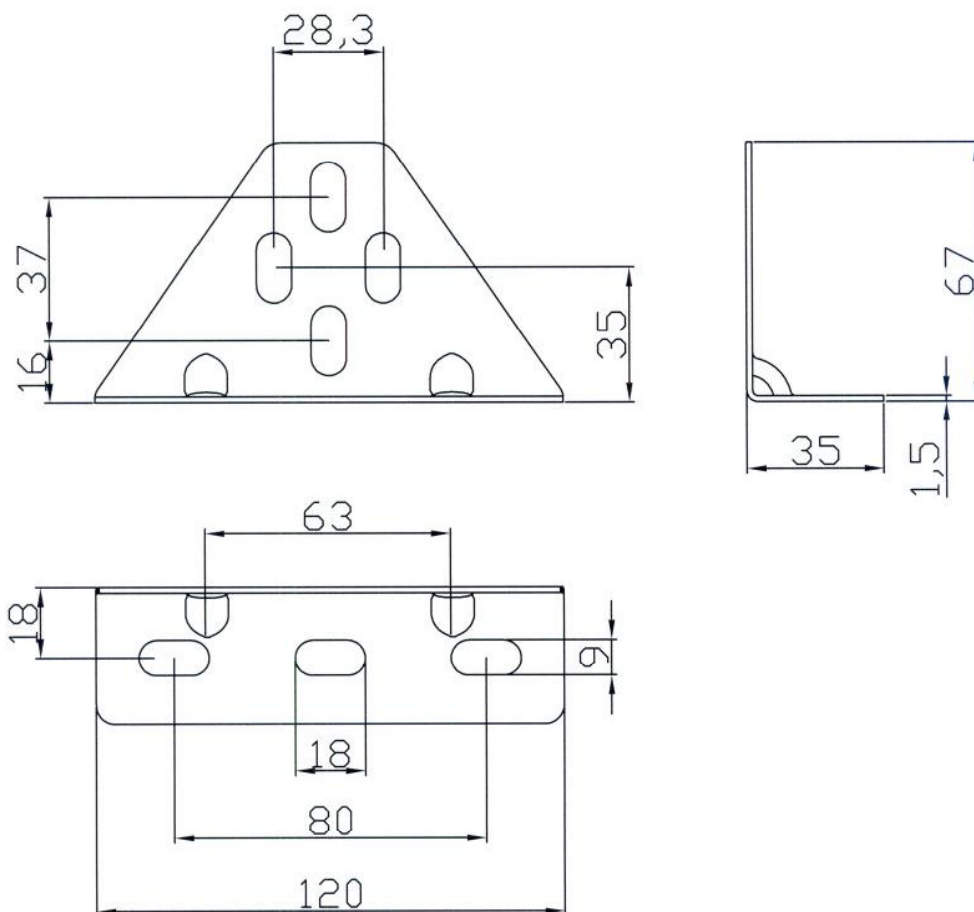


 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>Y. daš</i>
Dokument č. / Document No. <i>FIRES-FR-009-09-AWE</i>	
Príloha č. / Appendix No. <i>64</i>	



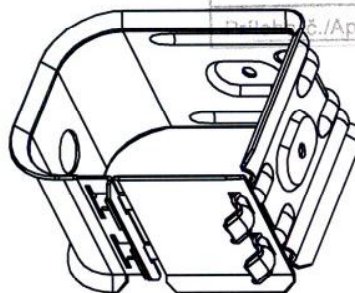
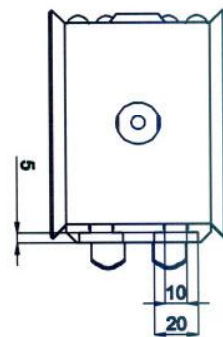
5	Ceownik wzmacniony	CWOP40H40/ 2E	805320	2000	3,50
4	Ceownik wzmacniony	CWOP40H40/05E	805305	500	0,88
3	Ceownik wzmacniony	CWOP40H40/04E	805304	400	0,70
2	Ceownik wzmacniony	CWOP40H40/03E	805303	300	0,53
1	Ceownik wzmacniony	CWOP40H40/02E	805302	200	0,35
LP	Nazwa wyrobu	Symbol	Nr Katalogowy	L [mm]	Masa [kg]

 Odczytka symbolu nie tolerowanych	Grubość (mm) 1,5	Materiał Blacha kwasoodporna Nr normy PN 011819 półfabrykat (nr normy) -----	Masa [kg] ---	Podziałka 1:1	Format A4							
					Arkusz ---							
Projektant Jacek Grochowski	Nazwa rysunku CWOP40H40/...E	Data 20.10.05	Nr rysunku 8053.....	Nr zmiany <table border="1"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>								
Rysował Jakub Rudak	Data 20.02.08											
Sprawił Jacek Kliczek	Data 20.02.08											
Zatwierdził Jacek Kliczek	Data 20.02.08											
Profesjonalne Systemy Tras Kablowych												

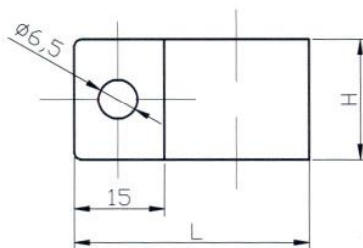
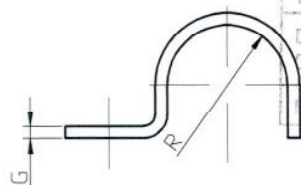


 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date 16. 01. 2009
	Podpis/Signature <i>J. J. J.</i>
Dokument č. Document No. <i>FIRES-FR-004-09-PRUE</i>	
Príloha č./Appendix No. <i>66</i>	

	Odchylna výměrů netolerovaných	Materiál Nr. normy półfabrykat (nr. normy)	Gatunek ----- ----- -----	Masa (kg) -----	Podziałka 1:1	Format A3 Arkusz Arkuszy
Projektował Rysował Sprawdził Zatwierdził	Nazwisko M. Stawikowski Podpis _____ _____ _____	Data 13.10.08	Nazwa rysunku UTMO			
 Profesjonalne Systemy Tras Kablowych			Nr. katalogu -----			

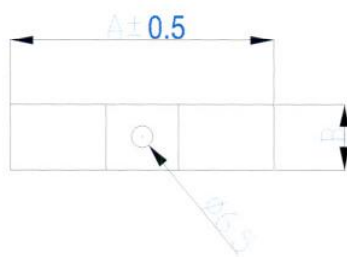
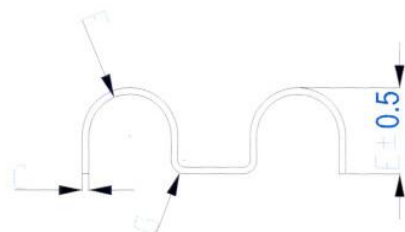
[illegible]

	Dátum/Date <i>16.01.2009</i> <i>J. J. J.</i> Podpis/Signature
Dokument č. Document No.	<i>FIRES-FR-004-09-AWE</i>
Príloha/D. Appendix No.	<i>64</i>



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

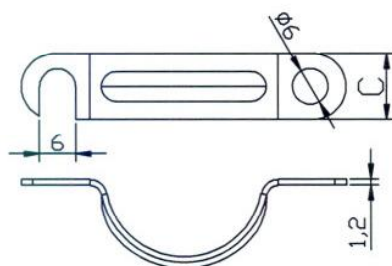
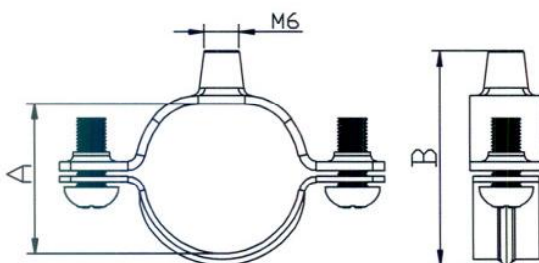
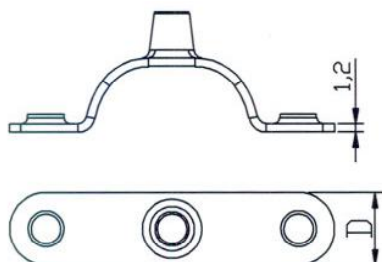
	Długość wymiary niezależnych	$\pm 0,5$	Metryczka Nr normy półfabrykat (nr normy)	Gatunek PN-EN 10327:2005 -----	Masa Dg ---	Podziałka 1:1	Format A4
							Arkusze ---
Projektant	Jacek Grochowski	Podpis	Data	Nazwa rysunku UDF 5-43			
Rysownik	Jakub Rudak		20.10.05				
Sprawił	Jacek Kliczek		20.02.08				
Zatwierdził	Jacek Kliczek		20.02.08				
Profesjonalne Systemy Tras Kablowych			Nr rysunku 4055.....		Nr zmiany		



 FIRES S.T.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>Yda</i>
Dokument č. Document No. <i>FIRES-FR-004-09-MWE</i>	
Príloha č./Appendix Nb. <i>69</i>	

	A	B	C	E	F	G
UEF5	38	14	1.2	5	R2.5	R2.4
UEF6	40	14	1.2	6	R3	R2.4
UEF7	42	14	1.2	7	R3.5	R2.4
UEF8	44	14	1.2	8	R4	R2.4
UEF9	46	14	1.2	9	R4.5	R2.4
UEF10	48	14	1.2	10	R5	R2.4
UEF12	52	14	1.2	12	R6	R2.4
UEF14	58	20	2	15	R7	R4
UEF15	60	20	2	16	R7.5	R4
UEF16	62	20	2	17	R8	R4
UEF18	66	20	2	19	R9	R4
UEF20	70	20	2	21	R10	R4
UEF22	74	20	2	23	R11	R4
UEF25	80	20	2	26	R12.5	R4

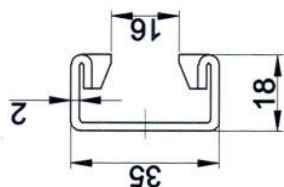
	Uchytka wyniorów nieolerowanych		Materiál	Gatunek		Masa [kg]	Podziałka	Formát
				Nr normy	PN-EN 10142 + A1 : 1997		1:1	A4
				półfabrykat (nr normy)				Arkusz
								1
Projektował	J.GROCHOWSKI	Podpis	Data	Nazwa rysunku				
Rysował	J.GROCHOWSKI			UEF				
Sprawdził	T.WŁODARCZYK							
Zatwierdził	JKLICZEK							
				Nr programu maszynowego				Nr zmiany
				Nr rysunku				
Profesjonalne Systemy								
Tras. Kablowych								



 FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature <i>J. Grochowski</i>
Dokument č. / Document No. FIRES-FR-004-09 ANE	
Príloha č./Appendix Nb. 40	

symbol	A	B	C	D
KSA 6	5	9	11	12
KSA 8	7	15	11	12
KSA 10	9	17	11	12
KSA 12	11	19	11	12
KSA 14	13	22	11	12
KSA 16	15	24	11	12
KSA 18	17	26	11	12
KSA 20	19	27	11	12
KSA 22	21	29	11	14
KSA 24	23	31	11	14
KSA 25	24	32	11	14
KSA 26	25	33	11	14
KSA 28	27	35	11	14
KSA 32	31	39	11	14
KSA 33	32	40	12	16
KSA 35	34	42	12	16
KSA 36	35	45	12	16
KSA 40	39	47	12	16
KSA 42	41	49	12	16
KSA 48	46	56	14	16
KSA 50	48	58	14	16
KSA 55	53	62	14	16

 Odchyłka wymiarów niezgodnych	Nazwisko J.GROCHOWSKI J.GROCHOWSKI T.WŁODARCZYK JKLIČEK	Podpis 	Gatunek Nr normy półfabrykat (nr normy)	Masa [kg] 	Podziałka 1:1	Format A4 Arkusz 1 Arkuszy 1
			Projektował Rysował Sprawdził Zatwierdził	Data 20.10.04 20.10.04 20.10.04 20.10.04	Nazwa rysunku KSA	Nr programu maszynowego ---
Profesjonalne Systemy Tras Kablowych			Nr rysunku ---	 		

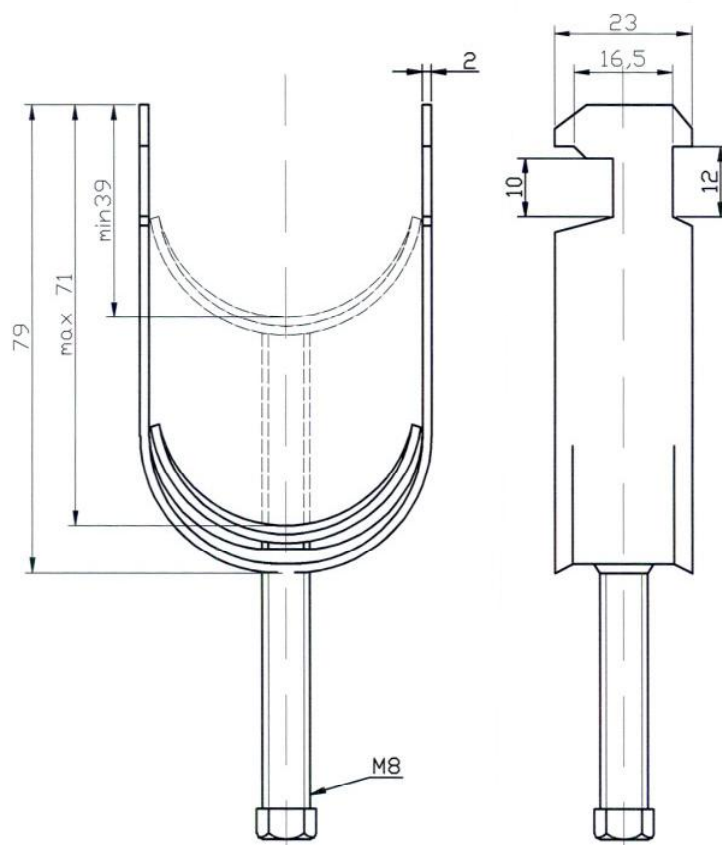


8	Szczelbel	SDDC 1000	990	Blstalcynk.net.ędzinlra PN-EN 10327:2005	800190
7	Szczelbel	SDDC 800	790	Blstalcynk.net.ędzinlra PN-EN 10327:2005	800180
6	Szczelbel	SDDC 600	590	Blstalcynk.net.ędzinlra PN-EN 10327:2005	800160
5	Szczelbel	SDDC 500	490	Blstalcynk.net.ędzinlra PN-EN 10327:2005	800150
4	Szczelbel	SDDC 400	390	Blstalcynk.net.ędzinlra PN-EN 10327:2005	800140
3	Szczelbel	SDDC 300	290	Blstalcynk.net.ędzinlra PN-EN 10327:2005	800130
2	Szczelbel	SDDC 200	190	Blstalcynk.net.ędzinlra PN-EN 10327:2005	800120
1	Szczelbel	SDDC 100	90	Blstalcynk.net.ędzinlra PN-EN 10327:2005	800110
Pos.	Nazwa	Symbol	Długość L (mm)	Materiał	Kodologia Nr.
gekonstruier					
gezeichnet	M. Stachowiak		02.10.2009		
geprüft					
Nachstuf					
 BAKS dział konstrukcyjny ul. Jagodnie 5 05-480 Karpczew			Blat	/ von /	Größe A3
			Name		
			Verfahren <i>Forschen</i>		
1:1			Szczelbel SDDC..... A		

 FIRES s.r.o. POŽIARNA ODOLNOSŤ FIRE RESISTANCE	Dátum/Date <i>16.04.2004</i> Podpis/Signature <i>J. J. J.</i>	Dokument č. <i>FIRE5-FR-004-03-AWE</i> Document No.	Príloha č./Appendix No. <i>41</i>
---	---	--	--

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

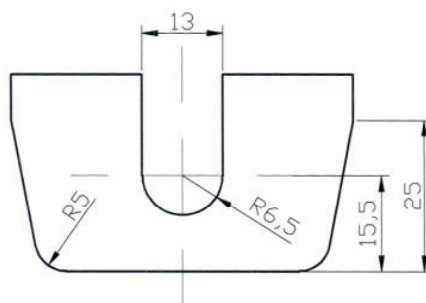
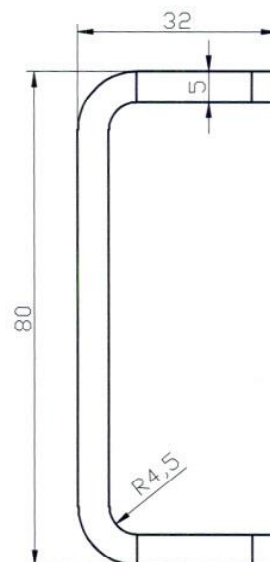
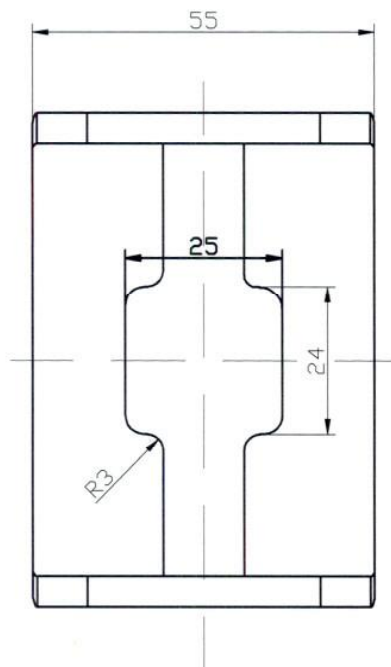
 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 16.01.2009 J. Jasiński
	Podpis/Signature
Dokument č. / Document No. FIRES-FR-004-09-AWE	
Príloha č./Appendix No. 42	

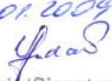


	Odchylka výměřů nietolerowanych		Materiál Gatunek Nr normy półfabrykat (nr normy)		Masa (kg) -----	Podziałka 1:1	Format A4 Arkusz 1 Arkuszy 1
	Projektował T. Grudniński	Rysował J. Jasiński	Sprawdził J. Kliczek	Zatwierdził J. Kliczek	Data 2004.12.29 2004.12.29 2004.12.29 2004.12.29	Nazwa rysunku UKD1/38-40E	
Nr programu maszynowego ---					Nr rysunku ---		
Nr zmiany ---					---		

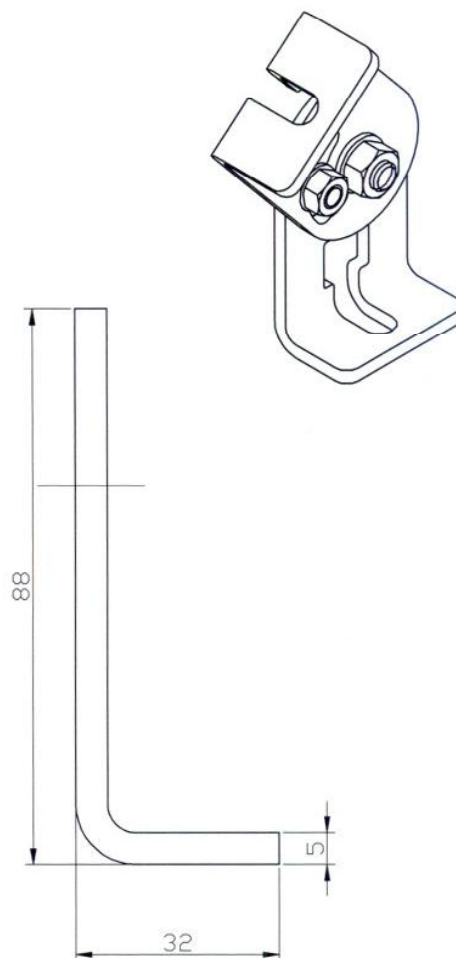
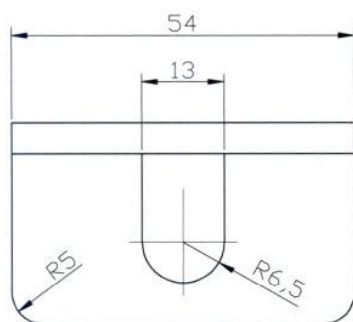
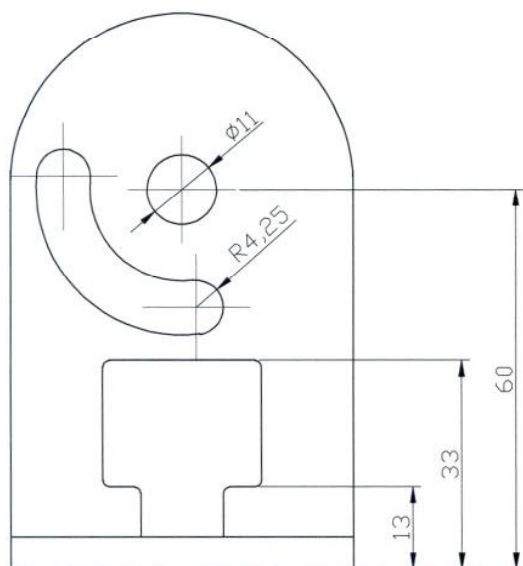


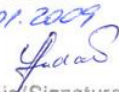
Profesjonalne Systemy
Tras Kablowych



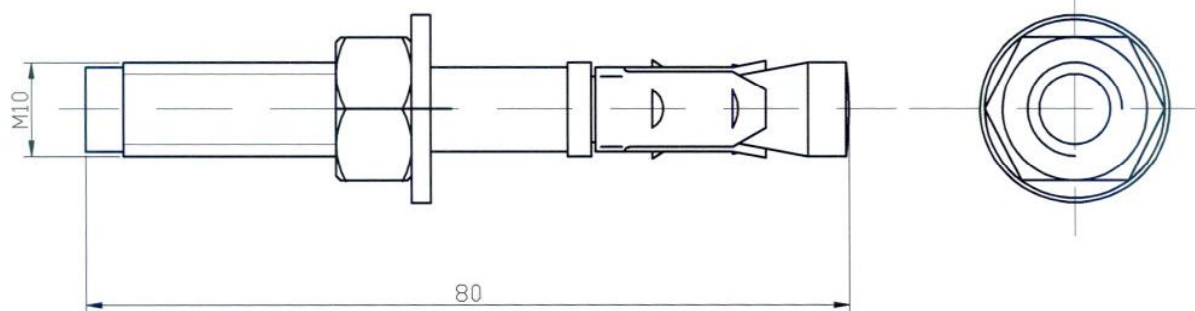
 FIRES s.r.o. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Datum/Date 16.01.2009  Podpis/Signature
	Dokument č. Document No. FIRES-FR-004-09-BWE
Příloha č./Appendix No. 43	

	Uchytka wymiarów nietolerowanych	Grubość [mm] 5	Materiał Gatunek Nr normy podfabrykat (nr normy)	Blacha stal. cynk. met. zanurz. PN-EN ISO 1461:2000	Masa [kg] 0,21	Podziałka 1:1	Format A4 Arkusz Arkuszy									
Projektował	J.GROCHOWSKI	Podpis _____ _____ _____ _____	Data 20.10.05	Nazwa rysunku USDV												
Rysował	J.Grochowski		20.10.05													
Sprawił	T.WŁODARCZYK		20.10.05													
Zatwierdził	J.KLICZEK		20.10.05													
 Profesjonalne Systemy Tras Kablowych			Nr rysunku 803700				Nr zbilansy <table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>									

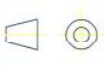


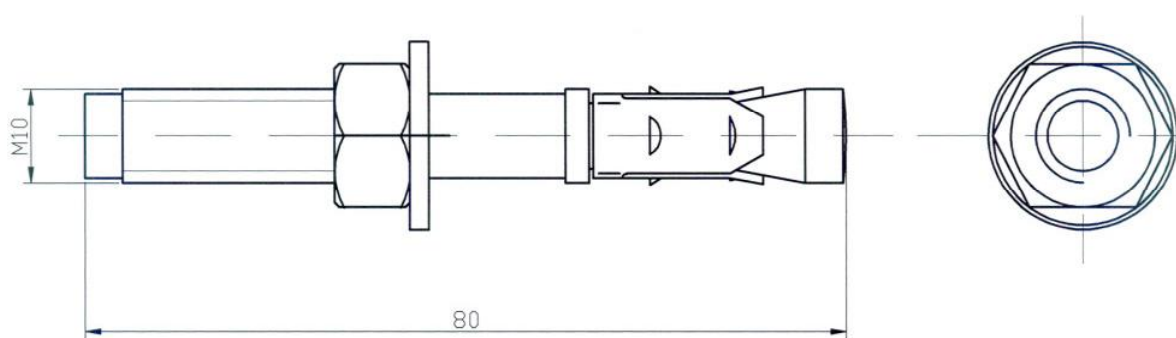
 FIRES s.r.o. POŽIARNA ODOLNOST' FIRE RESISTANCE	Dátum/Date 16.01.2009  Podpis/Signature
	Dokument č. Document No. FIRES-FR-009-0A-ANNE
Příloha č./Appendix No. 44	

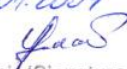
 Dřchytka vyniarów nietolerowanych	Material Blacha kwasoodporna	Masa [kg] 0,41	Podziałka 1:1	Format A4 Arkusz -- Arkuszy --									
Projektował T. GRUDNIEWSKI Rysował J. JASIŃSKI Sprawdził JACEK KLICZEK Zatwierdził JACEK KLICZEK	Nazwisko Podpis Data 29.12.04 29.12.04 29.12.04 29.12.04	Nazwa rysunku WPPDVE WIESZAK PRZEGUBOWY PRĘTA Nr rysunku 803801											
 Profesjonalne Systemy Tras Kablowych		Nr zmiany <table border="1"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table>											



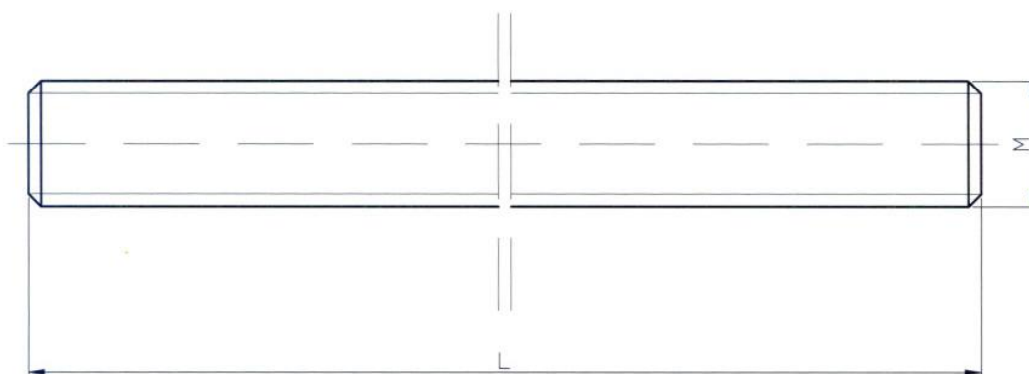
 FIRES s.r.o. POŽIARNA ODOLNOST FIRE RESISTANCE	Dátum/Date 16.01.2009
	Podpis/Signature 
Dokument č. Document No. FIRES-FR-004-03-AWNE	
Příloha č./Appendix No. 45	

	Odchytky wymiarów nietolerowanych		Materiał Gatunek Nr normy półfabrykat (nr normy)	Stal cynkowana galwanicznie	Masa [kg]	Podziałka 1:1	Format A4
Projektował J.GROCHOWSKI	Nazwisko Podpis	Podpis	Data 20.10.05	Nazwa rysunku PSROM10x80			
Rysował J.Grochowski			Data 20.10.05	804100			
Sprawdził T.WŁODARCZYK			Data 20.10.05				
Zatwierdził J.KLICZEK			Data 20.10.05				
 Profesjonalne Systemy Tras. Kablowych			Nr rysunku		Nr zmiany		



 FIRES s.r.o. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Datum/Date 16. 01. 2009
	Podpis/Signature 
Dokument č. / Document No. FIRES-FR-004-09-ANNE	
Příloha č./Appendix Nb. 46	

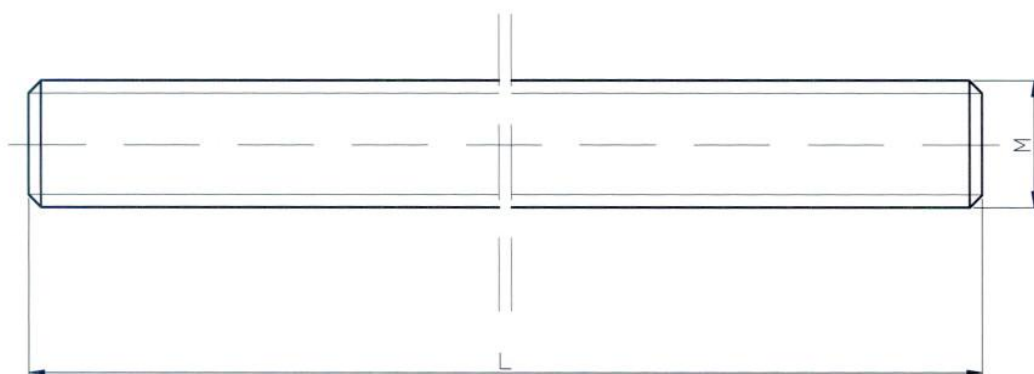
	Odchyłka wymiarów nie tolerowanych		Materiał Gatunek Nr normy	Stal kwasoodporna w gat. A4	Masa [kg]	Podziałka 1:1	Format A4
				półfabrykat (nr normy)			Arkusz
Projektował J.GROCHOWSKI	Nazwisko J.Grochowski T.WŁODARCZYK J.KLICZEK	Podpis	Data 20.10.05	Nazwa rysunku PSROM10x80E			
Rysował J.Grochowski			Data 20.10.05	Nr rysunku 804101			
Sprawdził T.WŁODARCZYK			Data 20.10.05				
Zatwierdził J.KLICZEK			Data 20.10.05				
 Profesjonalne Systemy Tras Kablowych							Nr zmiany



FIRES S.R.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE	Datum/Date <i>16.01.2009</i>
	Podpis/Signature <i>[Signature]</i>
	Dokument č. Document No. <i>FIRES-FR-004-07-AWE</i>
	Príloha č./Appendix No. <i>44</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

	Odchyłka wymiarów niezgodności	Grubość (mm) -	Gatunek Nr normy	Stal cynkowana galwanicznie	Masa (kg)	Podziałka 2:1	Format A4
							Arkusz Arkusz
Projektował Rysował Sprawdził Zatwierdził	Nazwisko J.GROCHOWSKI J.Grochowski T.WŁODARCZYK JKLICZEK	Podpis _____ _____ _____ _____	Data 20.10.05 20.10.05 20.10.05 20.10.05	Nazwa rysunku <i>PGM.... / 1</i>			
Profesjonalne Systemy Tras Kablowych				Nr rysunku		Nr zmiany	



 FIRES S.I.O. POŻIARNA ODOLNOŚĆ FIRE RESISTANCE		Datum/Date 16.01.2009 Podpis/Signature 		PGM10/1E	10	1000	0,49	652101
Dokument č. Document No.		Príloha č./Appendix No.		PGM6/1E	10	1000	0,16	
Dokument č. Document No.		Príloha č./Appendix No.		Symbol	Gwint M (mm)	Długość L (mm)	Masa (kg)	Nr katalogowy
Dokument č. Document No.		Príloha č./Appendix No.						
 Odchylka wymiarów nieolerowanych		Grubość [mm] -		Gatunek Nr normy		Stal kwasoodporna w gat.A4		Masa [kg]
Projektował Rysował Sprawdził Zatwierdził		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 PGM..../1E
 Profesjonalne Systemy Tras Kablowych				Nr rysunku				Nr zmiany
								Arkusz Arkuszy