TEST REPORT FIRES-FR-234-07-AUNE

Cable bearing system BAKS

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

FIRES
The Experts on Fire Safety

SNAS
Reg. No. 041/S-159

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

TEST REPORT

Test report number: **FIRES-FR-234-07-AUNE**
Tested property: Function in fire
Test method: DIN 4102 – 12:1998-11

Date of issue: **07. 01. 2008**

Name of the product: Cable bearing system BAKS

Manufacturer: **BAKS Kazimierz Sielski,** ul. Jagodne 5,
05-480 Karczew, Poland - producer of construction

Zaklady Kablowe Bitner Celina Bitner, Friedleina 3/3,
30-009 Kraków, Poland – producer of cables

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

---

Task No.: PR-07-0423
Specimen received: 10. 12. 2007
Date of the fire test: 13. 12. 2007
Technician responsible for the technical side of this report: Miroslav Hudák

---

Number of pages:	6	Number of appendices:	25
Test reports:	3	Copy No.:	2

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:	**BAKS Kazimierz Sielski,** ul. Jagodne 5, 05-480 Karczew, 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 power and communication non-halogen cables with circuit integrity maintenance. Persons witnessing the test:

Representatives of the sponsor: Mr. Jacek Kliczek (BAKS)
Mr. Adam Cichoń (Zaklady Kablowe Bitner)
Mr. Jan Krajewski (Zaklady Kablowe Bitner)

Test directed by: Mr. Štefan Rástocký
Test carried out by: Mr. Miroslav Hudák
Operator: Mr. Alexander Reľovský

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 06 501, F 06 502, F 06 503, F 06 504 F 06 505, F 06 506, F 06 507, F 06 508	Plate thermometers	temperature inside the test furnace, according to EN 1363-1 a DIN 4102-2
F 06 701	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 Zaklady Kablowe Bitner.

4. PREPARATION OF THE TEST

4.1 DESCRIPTION OF THE SPECIMEN STRUCTURE

Test specimen comprised from cable bearing systems BAKS with accessories – basket cable trays, ceiling ledges with clips UKO1, clips KSA, sleeves OZMO and power and communication non-halogen cables business Zaklady Kablowe Bitner.

Cables:	NHXH 4x1,5 RE FE180/E90 MICA	(6 x)
	NHXH 5x10 RE FE180/E90 MICA	(2 x)
	NHXH 4x50 RM FE180/E90 MICA	(6 x)
	NHXCH 4x1,5 RE/1,5 FE180/E90 MICA	(6 x)
	NHXCH 4x10 RE/10 FE180/E90 MICA	(2 x)
	NHXCH 4x50 RM/25 FE180/E90 MICA	(4 x)
	(N)HXCH 4x1,5 RE/1,5 FE180/E90 CERAMIC	(4 x)
	JE-H(St)H 2x2x0,8 FE180/E90 MICA	(10 x)
	JE-H(St)H 2x2x0,8 FE180/E90 CERAMIC	(4 x)
	HTKSH(ekw) 1x2x1,0 PH90	(6 x)

Ceiling installation: was made by ceiling ledges (type SDOC 600) which were fixed to ceiling by three dowels (type PRSO M8x75) in spacing of 300 mm. Cables were fixed to ledges by clips (type UKO1) in spacing of 300 mm and by cable clips (type KSA) depending on the diameter of cable which were fixed to ceiling by dowels (type SRO M6x30, TRSO M6x30, threaded bar M6x100) in spacing of 600 mm and sleeves OZMO, which were fixed to ceiling by dowels (type SRO M6x30) in spacing of 300 mm. Sleeves OZMO were loaded with 1 kg/m.
Suspension track No. 1: was made of three consoles combined of two horizontal supports (type CWOP40H40/05) and two threaded bar M8x600 with washers and nuts M8 and two hangers (type USOV) which were fixed to ceiling by dowels (type PRSO M8x75) in spacing of 1200 mm. Basket cable trays (type KDSO400H60) were fixed to horizontal supports. Load-bearing system was loaded with 20 kg/m.
Suspension track No. 2: was made of three consoles combined of horizontal support (type CWOP40H40/05) and two threaded bar M8x300 with washers and nuts M8 and two hangers (type ZK8) which were fixed to steel profiles I 80. These profiles were fixed to ceiling by four dowels (type PRSO M8x75) in spacing of 1200 mm. Basket cable trays (type KDSO400H60) were fixed to horizontal supports. Load-bearing system was loaded with 20 kg/m.
Suspension track No. 3 and 4: was made of three consoles (type WKSO60) which were fixed to ceiling by dowels (type SRO M6x30) in spacing of 1200 mm. Basket cable trays (type KDSO60H60) were fixed to consoles. Load-bearing system was loaded with 1,5 kg/m.
Types of individual components are from catalogue BAKS 8/2006.

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

More detailed information about specimen construction is shown in the drawings which form the appendix of 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
48,2	2,7	23,0	0,4

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

5. CARRYING OUT THE TEST

5.1 TEST CONDITIONS

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

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

Date of fire test	**Relative air humidity [%]**	**Ambient air temperature [°C]**
13. 12. 2007	30,1	10,7

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
Specimens 1, 2: cables NHXH 4x1,5 RE FE180/E90 MICA		**90 minutes no failure/interruption**
Specimens 3, 4: cables NHXH 4x50 RM FE180/E90 MICA		**90 minutes no failure/interruption**
Specimens 5, 6: cables NHXCH 4x1,5 RE/1,5 FE180/E90 MICA		**90 minutes no failure/interruption**
Specimens 7, 8: cables NHXCH 4x50 RM/25 FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 9: cable NHXCH 4x10 RE/10 FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 10: cable NHXCH 4x1,5 RE/1,5 FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 11: cable NHXH 5x10 RE FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 12: cable NHXH 4x1,5 RE FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 13: cable NHXH 5x10 RE FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 14: cable NHXH 4x1,5 RE FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 15: cable NHXCH 4x10 RE/10 FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 16: cable NHXCH 4x1,5 RE/1,5 FE180/E90 MICA		**70 minutes**
Specimens 17, 18: cables NHXH 4x1,5 RE FE180/E90 MICA		**90 minutes no failure/interruption**
Specimens 19, 20: cables NHXCH 4x1,5 RE/1,5 FE180/E90 MICA		**90 minutes no failure/interruption**
Specimens 21, 22: cables NHXCH 4x50 RM/25 FE180/E90 MICA		**90 minutes no failure/interruption**
Specimens 23, 24: cables NHXH 4x50 RM FE180/E90 MICA		**90 minutes no failure/interruption**
Specimens 25, 26: cables NHXH 4x50 RM FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 27: cable (N)HXCH 4x1,5 RE/1,5 FE180/E90 CERAMIC		**64 minutes**
Specimen 28: cable (N)HXCH 4x1,5 RE/1,5 FE180/E90 CERAMIC		**69 minutes**
Specimen 29: cable (N)HXCH 4x1,5 RE/1,5 FE180/E90 CERAMIC		**61 minutes**
Specimen 30: cable (N)HXCH 4x1,5 RE/1,5 FE180/E90 CERAMIC		**58 minutes**
Specimens 52A:	bundle of six cables HTKSH(ekw) - 1x2x1,0 PH90	**61 minutes**
Specimens 52B:		**90 minutes no failure/interruption**
Specimens 53A:		**41 minutes**
Specimens 53B:		**61 minutes**
Specimens 54A:		**63 minutes**
Specimens 54B:		**58 minutes**
Specimens 55, 56, 57, 58, 59, 60:	bundle of six cables JE-H(St)H - 2x2x0,8 FE180/E90 MICA	**90 minutes no failure/interruption**
Specimens 61, 62: cables JE-H(St)H - 2x2x0,8 FE180/E90 MICA		**90 minutes no failure/interruption**
Specimens 63, 64: cables JE-H(St)H - 2x2x0,8 FE180/E90 MICA		**90 minutes no failure/interruption**
Specimen 65: cable JE-H(St)H - 2x2x0,8 FE180/E90 CERAMIC		**90 minutes no failure/interruption**
Specimen 66: cable JE-H(St)H - 2x2x0,8 FE180/E90 CERAMIC		**75 minutes**
Specimen 67: cable JE-H(St)H - 2x2x0,8 FE180/E90 CERAMIC		**51 minutes**
Specimen 68: cable JE-H(St)H - 2x2x0,8 FE180/E90 CERAMIC		**87 minutes**

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

Specimens S1 – S30 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Specimens S52 – S68 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
Translated by: Ing. Marek Rusnák

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

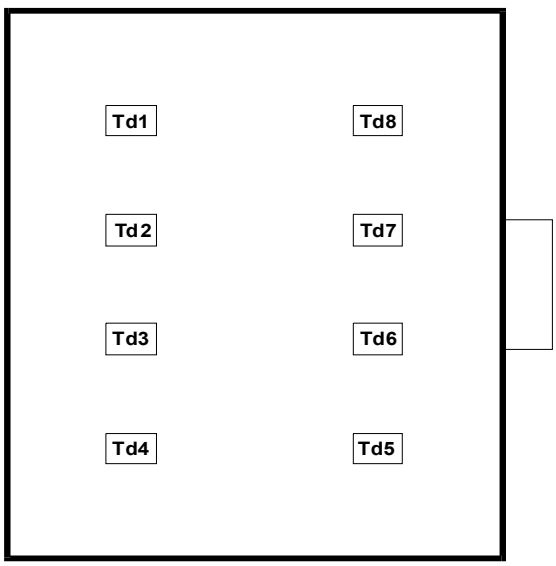
Appendix 1	Measured values inside the test furnace
Appendix 2	Measured values inside the test furnace / graph
Appendix 3	Measured times of tested specimens from S1 to S8
Appendix 4	Measured times of tested specimens from S9 to S16
Appendix 5	Measured times of tested specimens from S17 to S24
Appendix 6	Measured times of tested specimens from S25 to S30
Appendix 7	Measured times of tested specimens from S52 to S60
Appendix 8	Measured times of tested specimens from S61 to S68
Appendix 9	Layout of cables in the test furnace
Appendix 10-11	Photos taken before and after the fire test
Appendix 12- 25	Drawings

Measured values inside the test furnace

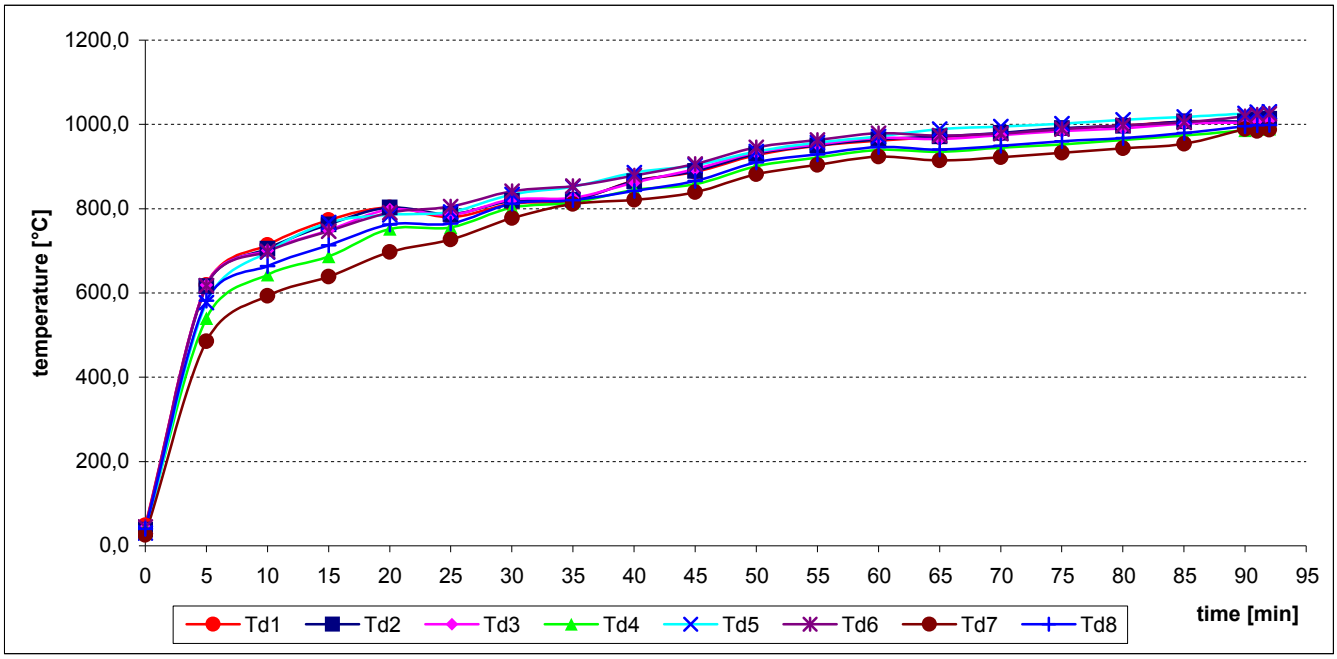
Time t [min]	Temperature [°C]											Deviation d_e [%]	Pressure p [Pa]
	Td1	Td2	Td3	Td4	Td5	Td6	Td7	Td8	Tave	Tn	To		
0	48,9	37,7	43,3	43,1	30,3	44,7	25,6	40,0	39,2	20,0	10,6	0,0	0,0
5	619,0	616,1	619,0	539,9	577,2	617,5	485,5	582,0	582,0	576,4	11,1	-0,1	14,5
10	713,7	704,9	700,8	643,0	697,2	698,4	592,8	664,1	676,9	678,3	11,7	1,6	16,2
15	773,3	762,6	748,8	686,5	767,3	746,7	639,1	713,2	729,7	738,5	11,6	0,5	15,6
20	803,0	802,7	798,2	752,2	785,2	791,0	697,1	762,2	774,0	781,3	11,4	0,1	16,5
25	780,2	786,6	785,6	755,5	792,1	805,0	726,9	764,9	774,6	814,6	11,5	-0,6	16,3
30	812,2	818,9	821,4	802,5	834,3	841,5	777,5	811,9	815,0	841,8	11,3	-1,5	15,9
35	819,7	820,7	825,2	813,8	852,0	853,3	810,9	820,1	827,0	864,8	11,0	-2,0	16,1
40	865,8	865,1	861,9	844,6	885,8	878,7	820,9	841,9	858,1	884,7	11,2	-2,2	16,5
45	886,8	889,1	893,8	858,2	902,9	905,9	839,2	865,9	880,2	902,3	11,1	-2,4	16,3
50	927,0	930,3	933,6	901,1	935,9	945,9	881,6	909,7	920,6	918,1	11,1	-2,1	16,6
55	949,3	949,9	952,4	921,5	956,7	962,9	903,9	928,5	940,6	932,3	11,3	-1,8	16,4
60	961,5	964,5	967,9	939,5	971,2	978,7	923,9	946,0	956,7	945,3	10,8	-1,6	16,6
65	970,2	971,3	965,0	935,1	988,5	973,6	914,4	940,1	957,3	957,3	11,0	-1,4	16,6
70	978,5	979,8	974,1	945,1	994,7	978,3	922,3	949,6	965,3	968,4	11,0	-1,3	16,7
75	989,7	990,9	984,4	952,4	1002,0	988,5	932,3	960,0	975,0	978,7	11,0	-1,2	16,3
80	997,1	996,8	990,7	963,0	1011,0	998,0	943,1	967,5	983,4	988,4	10,9	-1,2	17,1
85	1006,0	1007,0	1002,0	973,5	1018,0	1005,0	953,8	979,7	993,1	997,4	10,9	-1,1	17,3
90	1005,0	1007,0	1005,0	986,0	1026,0	1019,0	988,5	995,6	1004,0	1005,9	11,0	-1,1	16,7
91	1011,0	1012,0	1009,0	989,1	1029,0	1023,0	984,0	997,8	1006,9	1007,6	10,9	-1,1	17,2
92	1012,0	1013,0	1010,0	990,0	1030,0	1025,0	987,0	998,6	1008,2	1009,2	10,9	-1,0	17,3

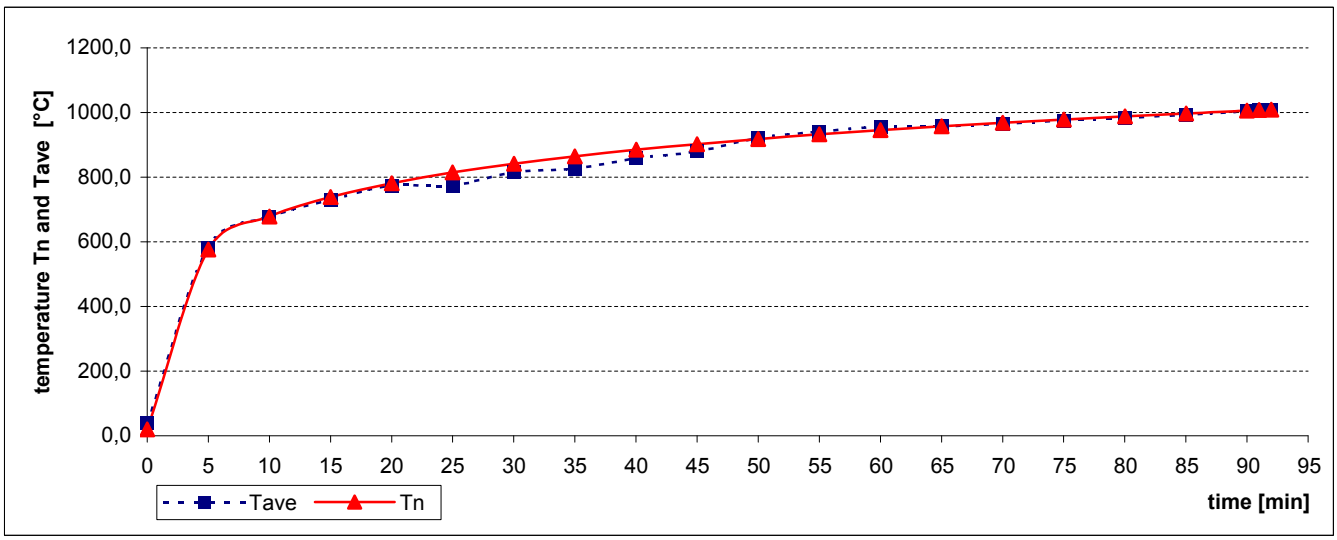
Tave Average temperature in the test furnace calculated from plate thermometers
Tn Standard temperature in the test furnace laid down to test guideline
To Ambient temperature
d_e Deviation of the average temperature from the standard temperature calculated according to test guideline
p Pressure inside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

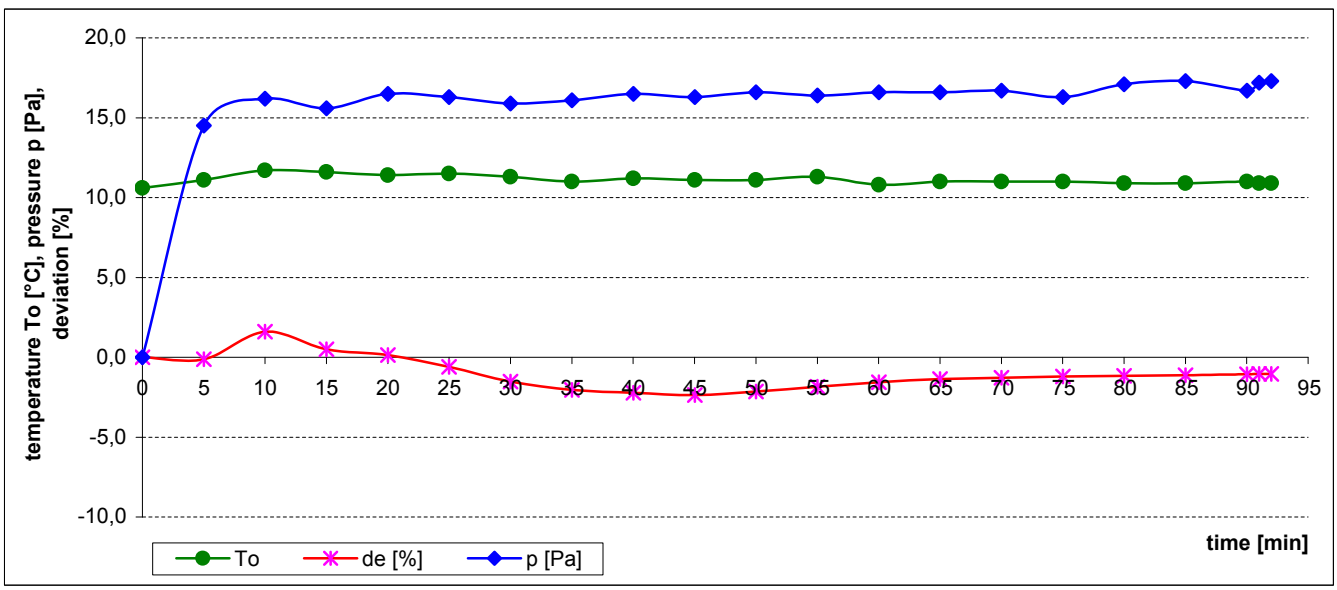
Layout of measuring points in the test furnace:



Measured values inside the test furnace / graph







Measured time of tested specimens from S1 to S8

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

Specimens 1,2: cables NHXH 4x1,5 RE FE180/E90 MICA
Specimens 3,4: cables NHXH 4x50 RM FE180/E90 MICA
Specimens 5,6: cables NHXCH 4x1,5 RE/1,5 FE180/E90 MICA
Specimens 7,8: cables NHXCH 4x50 RM/25 FE180/E90 MICA

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	70:37
	62-L2	x
	63-L3	x
	64-PEN	x

Specimens 9,15: cables NHXCH 4x10 RE/10 FE180/E90 MICA
Specimens 10,16: cables NHXCH 4x1,5 RE/1,5 FE180/E90 MICA
Specimens 11,13: cables NHXH 5x10 RE FE180/E90 MICA
Specimens 12,14: cables NHXH 4x1,5 RE FE180/E90 MICA

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	no failure / interruption
	70-L2	no failure / interruption
	71-L3	no failure / interruption
	72-PEN	no failure / interruption
S19	73-L1	no failure / interruption
	74-L2	no failure / interruption
	75-L3	no failure / interruption
	76-PEN	no failure / interruption
S20	77-L1	no failure / interruption
	78-L2	no failure / interruption
	79-L3	no failure / interruption
	80-PEN	no failure / interruption
S21	81-L1	no failure / interruption
	82-L2	no failure / interruption
	83-L3	no failure / interruption
	84-PEN	no failure / interruption
S22	85-L1	no failure / interruption
	86-L2	no failure / interruption
	87-L3	no failure / interruption
	88-PEN	no failure / interruption
S23	89-L1	no failure / interruption
	90-L2	no failure / interruption
	91-L3	no failure / interruption
	92-PEN	no failure / interruption
S24	93-L1	no failure / interruption
	94-L2	no failure / interruption
	95-L3	no failure / interruption
	96-PEN	no failure / interruption

Specimens 17,18: cables NHXH 4x1,5 RE FE180/E90 MICA
Specimens 19,20: cables NHXCH 4x1,5 RE/1,5 FE180/E90 MICA
Specimens 21,22: cables NHXCH 4x50 RM/25 FE180/E90 MICA
Specimens 23,24: cables NHXH 4x50 RM FE180/E90 MICA

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 S30

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	64:19
	106-L2	64:19
	107-L3	64:19
	108-PEN	x
S28	109-L1	69:14
	110-L2	69:14
	111-L3	69:14
	112-PEN	x
S29	113-L1	61:53
	114-L2	61:53
	115-	61:53
	116-PEN	x
S30	117-L1	x
	118-L2	58:29
	119-L3	58:29
	120-PEN	x

Specimens 25,26: cables NHXH 4x50 RM FE180/E90 MICA
Specimens 27,28: cables (N)HXCH 4x1,5 RE/1,5 FE180/E90 CERAMIC
Specimens 29,30: cables (N)HXCH 4x1,5 RE/1,5 FE180/E90 CERAMIC

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 S60

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S52A	209-L	61:15
	210-PEN	x
S52B	211-L	no failure / interruption
	212-PEN	no failure / interruption
S53A	213-L	41:27
	214-PEN	x
S53B	215-L	61:15
	216-PEN	x
S54A	217-L	63:55
	218-PEN	x
S54B	219-L	58:27
	220-PEN	x
S55	221-L	no failure / interruption
	222-PEN	no failure / interruption
	223-L	no failure / interruption
	224-PEN	no failure / interruption
S56	225-L	no failure / interruption
	226-PEN	no failure / interruption
	227-L	no failure / interruption
	228-PEN	no failure / interruption
S57	229-L	no failure / interruption
	230-PEN	no failure / interruption
	231-L	no failure / interruption
	232-PEN	no failure / interruption
S58	233-L	no failure / interruption
	234-PEN	no failure / interruption
	235-L	no failure / interruption
	236-PEN	no failure / interruption
S59	237-L	no failure / interruption
	238-PEN	no failure / interruption
	239-L	no failure / interruption
	240-PEN	no failure / interruption
S60	241-L	no failure / interruption
	242-PEN	no failure / interruption
	243-L	no failure / interruption
	244-PEN	no failure / interruption

Specimens 52A,52B, 53A,53B,54A,54B:	bundle of six cables HTKSH(ekw) - 1x2x1,0 PH90
Specimens 55,56, 57,58,59,60:	bundle of six cables JE-H(St)H - 2x2x0,8 FE180/E90 MICA

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

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

Measured time of tested specimens from S61 to S68

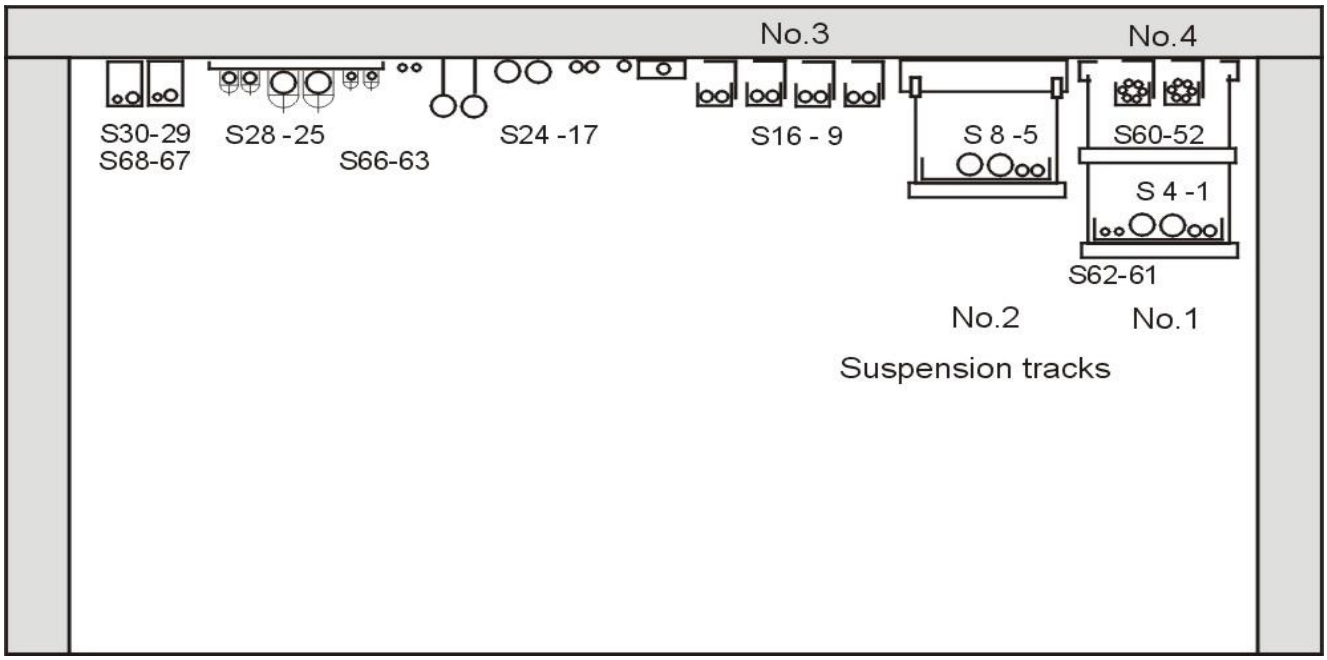
Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S61	245-L	no failure / interruption
	246-PEN	no failure / interruption
	247-L	no failure / interruption
	248-PEN	no failure / interruption
S62	249-L	no failure / interruption
	250-PEN	no failure / interruption
	251-L	no failure / interruption
	252-PEN	no failure / interruption
S63	253-L	no failure / interruption
	254-PEN	no failure / interruption
	255-L	no failure / interruption
	256-PEN	no failure / interruption
S64	257-L	no failure / interruption
	258-PEN	no failure / interruption
	259-L	no failure / interruption
	260-PEN	no failure / interruption
S65	261-L	no failure / interruption
	262-PEN	no failure / interruption
	263-L	no failure / interruption
	264-PEN	no failure / interruption
S66	265-L	75:53
	266-PEN	x
	267-L	75:53
	268-PEN	x
S67	269-L	51:18
	270-PEN	x
	271-L	x
	272-PEN	x
S68	273-L	x
	274-PEN	x
	275-L	87:53
	276-PEN	x

Specimens 61,62: cables JE-H(St)H - 2x2x0,8 FE180/E90 MICA
Specimens 63,64: cables JE-H(St)H - 2x2x0,8 FE180/E90 MICA
Specimens 65,66: cables JE-H(St)H - 2x2x0,8 FE180/E90 CERAMIC
Specimens 67,68: cables JE-H(St)H - 2x2x0,8 FE180/E90 CERAMIC

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

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

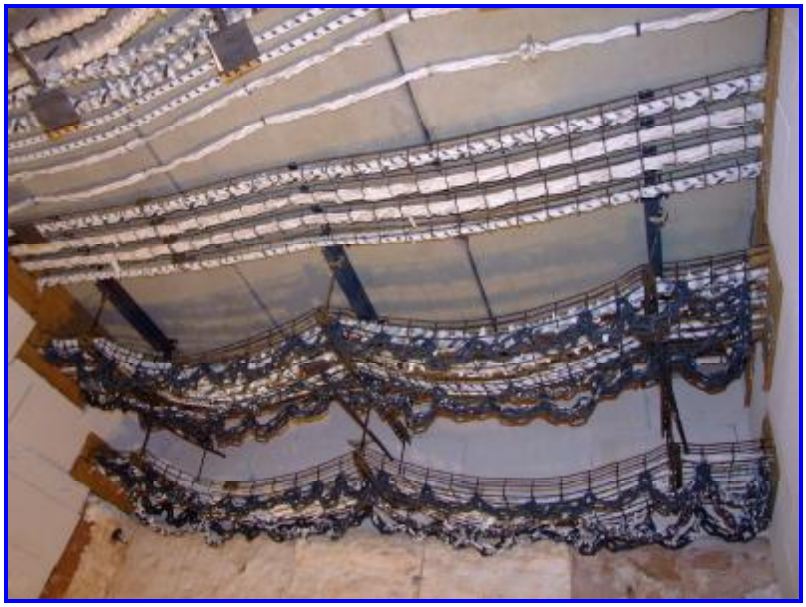
Layout of cables in the test furnace

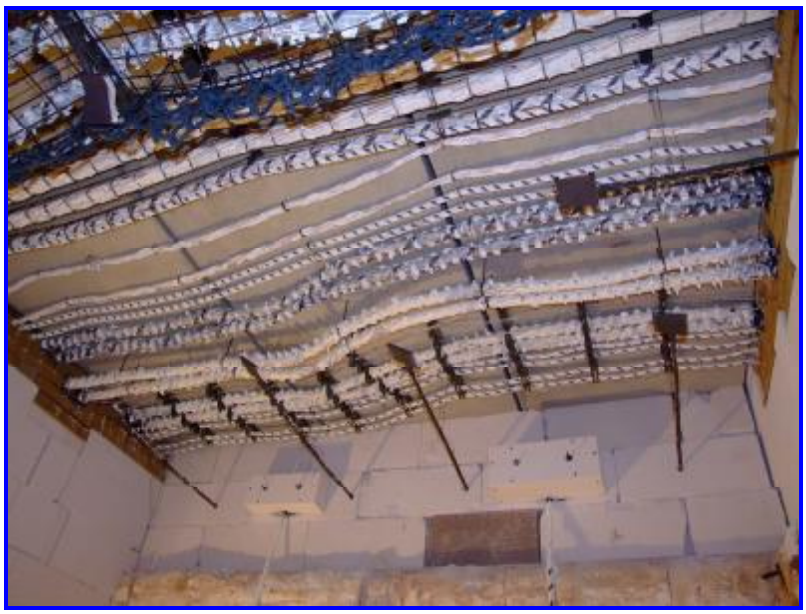


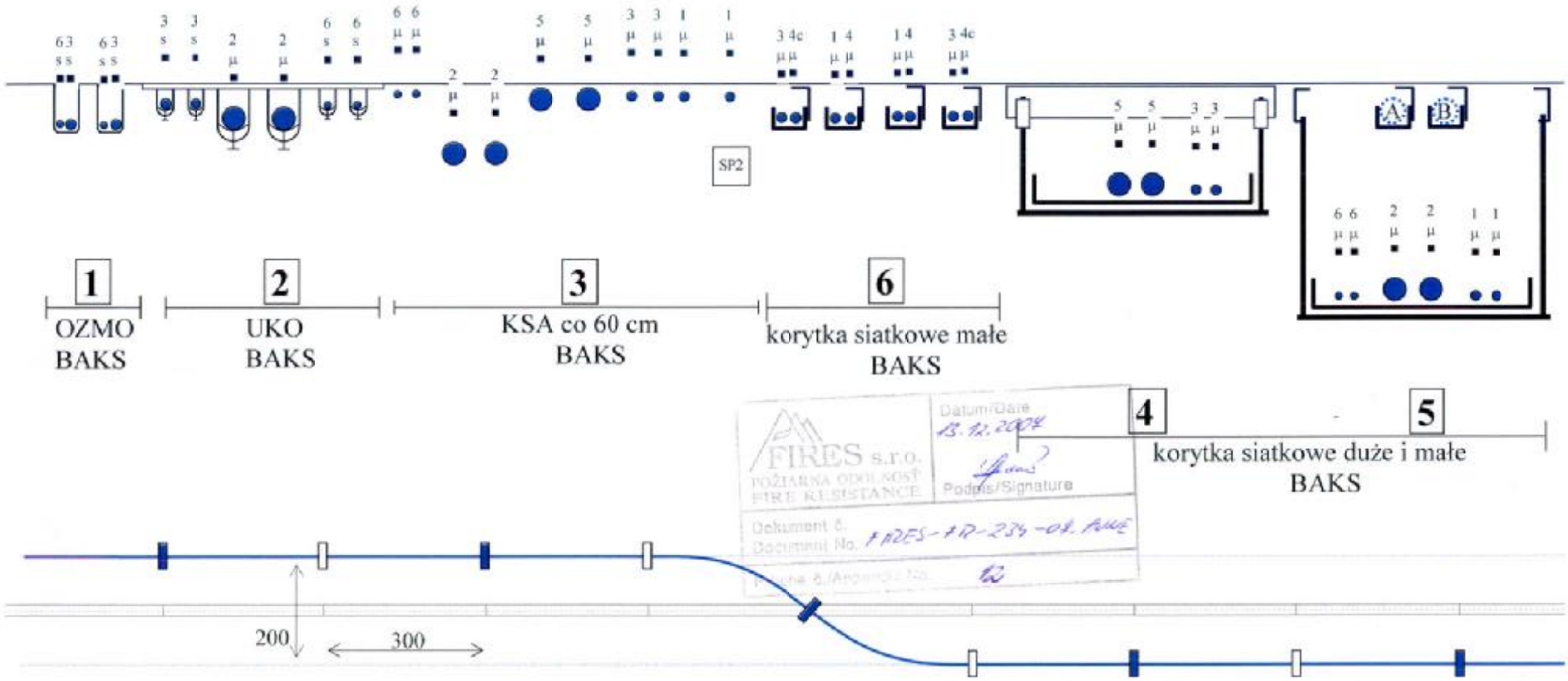
Specimens 1,2: cables NHXH 4x1,5 RE FE180/E90 MICA		Specimens placed in the basket cable tray (BAKS) Suspension track No.1
Specimens 3,4: cables NHXH 4x50 RM FE180/E90 MICA		
Specimens 5,6: cables NHXCH 4x1,5 RE/1,5 FE180/E90 MICA		Specimens placed in the basket cable tray (BAKS) Suspension track No.2
Specimens 7,8: cables NHXCH 4x50 RM/25 FE180/E90 MICA		
Specimens 9,15: cables NHXCH 4x10 RE/10 FE180/E90 MICA		Specimens placed in the basket cable tray (BAKS) Suspension track No.3
Specimens 10,16: cables NHXCH 4x1,5 RE/1,5 FE180/E90 MICA		
Specimens 11,13: cables NHXH 5x10 RE FE180/E90 MICA		
Specimens 12,14: cables NHXH 4x1,5 RE FE180/E90 MICA		
Specimens 17,18: cables NHXH 4x1,5 RE FE180/E90 MICA		Specimens placed in ceiling clips KSA (BAKS) in spacing of 600 mm
Specimens 19,20: cables NHXCH 4x1,5 RE/1,5 FE180/E90 MICA		
Specimens 21,22: cables NHXCH 4x50 RM/25 FE180/E90 MICA		
Specimens 23,24: cables NHXH 4x50 RM FE180/E90 MICA		
Specimens 25,26: cables NHXH 4x50 RM FE180/E90 MICA		Specimens placed in ceiling profile ledges with clips UKO (BAKS) in spacing of 300 mm
Specimens 27,28: cables (N)HXCH 4x1,5 RE/1,5 FE180/E90 CERAMIC		
Specimens 29,30: cables (N)HXCH 4x1,5 RE/1,5 FE180/E90 CERAMIC		Specimens placed in ceiling clips OZMO (BAKS) in spacing of 300 mm
Specimens 52A,52B, 53A,53B,54A,54B:	bundle of six cables HTKSH(ekw) 1x2x1,0 PH90	Specimens placed in the basket cable tray (BAKS) Suspension track No.4
Specimens 55,56, 57,58,59,60:	bundle of six cables JE-H(St)H - 2x2x0,8 FE180/E90 MICA	
Specimens 61,62: cables JE-H(St)H - 2x2x0,8 FE180/E90 MICA		Specimens placed in the basket cable tray (BAKS) Suspension track No.1
Specimens 63,64: cables JE-H(St)H - 2x2x0,8 FE180/E90 MICA		Specimens placed in ceiling clips KSA (BAKS) in spacing of 600 mm
Specimens 65,66: cables JE-H(St)H - 2x2x0,8 FE180/E90 CERAMIC		Specimens placed in ceiling profile ledges with clips UKO (BAKS) in spacing of 300 mm
Specimens 67,68: cables JE-H(St)H - 2x2x0,8 FE180/E90 CERAMIC		Specimens placed in ceiling clips OZMO (BAKS) in spacing of 300 mm

Photos taken before the test

Photos taken after the termination of the test







FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE
Datum/Date 13.12.2007
Podpis/Signature
Dokument č./Document No. FIRES-FR-234-07 Příloha č./Appendix No.

NHXH 4 x 1,5 RE
NHXH 4 x 50 RM
NHXCH 4 x 1,5 RE / 1,5
NHXH 5 x 10 RE
NHXCH 4 x 10 RE / 10
NHXCH 4 x 50 RM / 25
JE-HStOH ssss0,8 Bd

1 s ■ 2 s ■ 3 s ■ 4 s ■ 4c s ■ 5 s ■ 6 s ■

kolumna w zestawieniu
s = ceramic; μ = mica
■ = E 90; ● = E 30
przekrój kabla w skali

Ⓐ **Wiązka kabli JE-HStH mica 2x2x0,8**

Ⓑ **Wiązka kabli HTKSH 2 x 1 PH90**

H ● = HTKSH 2x1

Obciążenie torów:
3 x 240/400V/60W
1 x 110V/3V/0,03W

Palenie 11
Rozmieszczenie próbek w piecu
Batizovce 13.12.2007.
Badanie kabli Bitner z osprzętem Baks, Spelsberg

Data 14.12.2007

BAKS -Bitner Badania FIRES Batizowce

Nr	*Symbol kaba*	*Pozycja*	*Przekrój kabla*	*Konstrukcja mocowania, odległość, obciążenie*	*Uwagi*
1	**JE-H(St)H 180/ E90 Ceramic**	**1**	**2x2x 0.8**	OZMO 0.3m / 1,1 kg/m	
2	**(N)HXCH FE 180/ E90 Ceramik**		**4x 1,5/1,5**	OZMO 0.3m / 1,1 kg/m	
3	**JE-H(St)H 180/ E90 Ceramic**		**2x2x 0.8**	OZMO 0.3m / 1,1 kg/m	
4	**(N)HXCH FE 180/ E90 Ceramik**		**4x 1,5/1,5**	OZMO 0.3m / 1,1 kg/m	
5	**(N)HXCH FE 180/ E90 Ceramic**	**2**	**4x 1,5/1,5**	UK1+ SDOC 0.3m	
6	**(N)HXCH FE 180/ E90 Ceramic**		**4x 1,5/1,5**	UK1+ SDOC 0.3m	
7	**NHXH FE 180 E90 Mika**		**4x 50**	UK1+ SDOC 0.3m	
8	**NHXH FE 180 E90 Mika**		**4x 50**	UK1+ SDOC 0.3m	
9	**JE-H(St)H 180/ E90 Ceramic**		**2x2x 0.8**	UK1+ SDOC 0.3m	
10	**JE-H(St)H 180/ E90 Ceramic**		**2x2x 0.8**	UK1+ SDOC 0.3m	
11	**JE-H(St)H 180/ E90 Mika**	**3**	**2x2x0,8**	KSA 0.6m	
12	**JE-H(St)H 180/ E90 Mika**		**2x2x0,8**	KSA 0.6m	
13	**NHXH FE 180/ E90 Mika**		**4x 50**	KSA 0.6m	
14	**NHXH FE 180/ E90 Mika**		**4x 50**	KSA 0.6m	
15	**NHXCH FE 180/ E90 Mika**		**4x 50/25**	KSA 0.6m	
16	**NHXCH FE 180/ E90 Mika**		**4x 50/25**	KSA 0.6m	
17	**NHXCH FE 180/ E90 Mika**		**4x 1,5/1,5**	KSA 0.6m	
18	**NHXCH FE 180/ E90 Mika**		**4x 1,5/1,5**	KSA 0.6m	
21	**NHXH FE 180/ E90 Mika**		**4x 1,5**	KSA 0.6m	
22	**NHXH FE 180/ E90 Mika**		**4x 1,5**	KSA 0.6m Puszka Spelsberg WKE 2	
23	**NHXCH FE 180/ E90 Mika**	**4**	**4x 50/25**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
24	**NHXCH FE 180/ E90 Mika**		**4x 50/25**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
27	**NHXCH FE 180/ E90 Mika**		**4x 1,5/1,5**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
28	**NHXCH FE 180/ E90 Mika**		**4x 1,5/1,5**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
29	**JE-H(St)H 180/ E90 Mika**	**5**	**2x2x 0.8**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
30	**JE-H(St)H 180/ E90 Mika**		**2x2x 0.8**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
31	**NHXH FE 180/ E90 Mika**		**4x 50**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
32	**NHXH FE 180/ E90 Mika**		**4x 50**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
33	**NHXH FE 180/ E90 Mika**		**4x 1,5**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
34	**NHXH FE 180/ E90 Mika**		**4x 1,5**	Korytko siatkowe B-400 1.2 m/ 20kg/m	
35	**Wiązka 6 kabli** **JE-H(St)H 180/ E90 Mika**		**2x2x0,8**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	
36	**Wiązka 6 kabli** **HTKSH 2x1 PH 90**		**2x1**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	
37	**NHXCH FE 180/ E90 Mika**	**6**	**4x 1,5/1,5**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	
38	**NHXCH FE 180/ E90 Mika**		**4x10/10**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	
39	**NHXH FE 180/ E90 Mika**		**4x 1,5**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	
40	**NHXH FE 180/ E90 Mika**		**5x10**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	

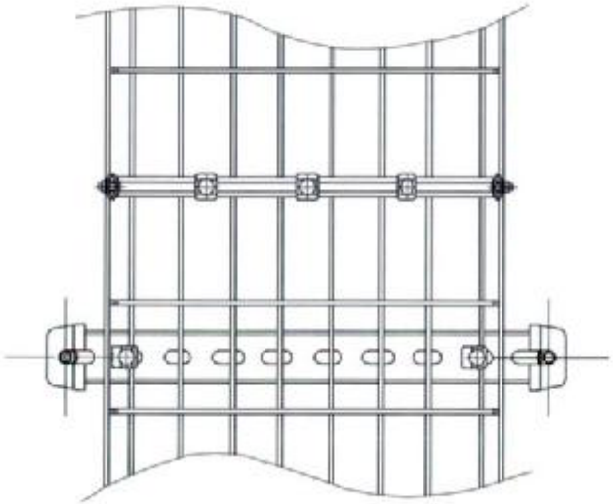
Nr	*Symbol kaba*	*Pozycja*	*Przekrój kabla*	*Konstrukcja mocowania, odległość, obciążenie*	*Uwagi*
41	**NHXH FE 180/ E90 Mika**		**4x 1,5**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	
42	**NHXH FE 180/ E90 Mika**		**5x10**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	
43	**NHCXH FE 180/ E90 Mika**		**4x 1,5/1,5**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	
44	**NHXCH FE 180/ E90 Mika**		**4x10/10**	Korytko siatkowe B-60 1.2 m/ 1,5kg/m	

Lp	Symbol kaba	Średnica kabla	Ciężar kabla	
1	**NHXCH FE 180/ E90 4x 50/25 Mika**	38mm	3.3 kg/m	
2	**NHXH FE 180/ E90 4x 50 Mika**	36 mm	3.05 kg/m	
3	**(N)HXCH FE 180/ E90 4x 1,5/1,5 Ceramik**	16mm	0.36 kg/m	
4	**NHXCH FE 180/ E90 4x 1,5/1,5 Mika**	17,6 mm	0,42 kg/km	
5	**NHXH FE 180/ E90 4x 1,5 Mika**	15mm	0.34 kg/m	
6	**NHXCH FE 180 /E90 4x 10/10 Mika**	25,2 mm	1,1 kg/km	
7	**NHXH FE 180/ E90 5x 10 Mika**			
8	**JE-H(St)H 2x2x 0.8 FE 180/ E90 Ceramik**	12,5 mm	0,16 kg/km	
9	**JE-H(St)H 2x2x 0.8 FE 180/ E90 Mika**	12 mm	0,18 kg/m	
10	**HTKSA 2 x1 PH 90**	mm	kg/m	

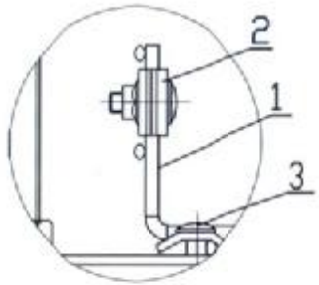
Mocowanie do betonu : pozycja 1,2,5,6, śruby SRO M6x 30
pozycja 4 zacisk ZK8 śruby PSRO M10x 80
pozycja 5 (korytka) śruby PSRO M10x 80
pozycja 3 śruby SRO M6x 30 + tuleje TRSO M6x 30

FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE
Dátum/Date 13.11.2008
Podpis/Signature
Dokument č. Document No. FIRES-FR-234-08-MWE
Príloha č./Appendix No. 14

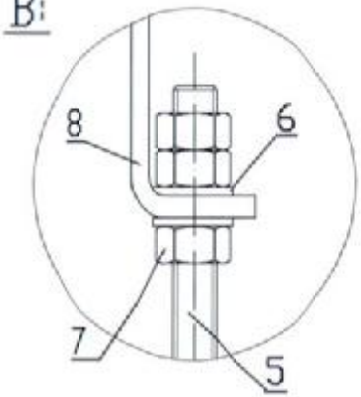
D-D



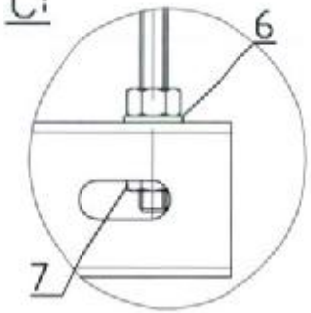
A:

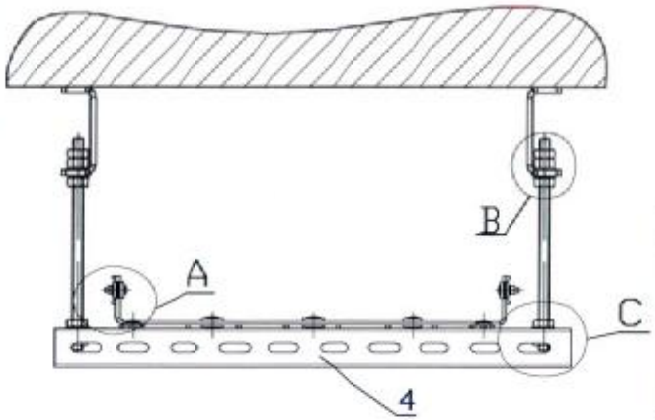


B:



C:





Poz.1		Poz.4
A	Typ	Typ
60	KDS060H60/3	
100	KDS100H60/3	CWP40H40/02
150	KDS150H60/3	
200	KDS200H60/3	CWP40H40/03
300	KDS300H60/3	CWP40H40/04
400	KDS400H60/3	CWP40H40/05

Poz.	Nazwa	Numer	Materiał	Szt.	Nr-ka katalogowy
8	uchyt sufitowy	USDV		2	885610
7	nairetka	KE M8		18	652098
6	podkładka	PP 8		8	652098
5	pręt gwintowany	PGM/2		2	655516
4	ceownik samocinny	CWP40H40/03		1	885365
3	zacisk strukowy	ZS		2	505660
2	haczyk	US5		3	908000
1	koryto siatkowe	KDS400H60/3		1	917840

opracował	JGrochowski	08.11.07
rysował	JGrochowski	08.11.07
zatwierdził	JKliczek	08.11.07

SKALA 1:5

KDS400H60/3

BAKS
DZIAŁ KONSTRUKCYJNY
ul. Jagodna 5 95-030 Karczew

Arkusz 1 z 1 | Arkusz A3

System odporności ogniowej EI-90

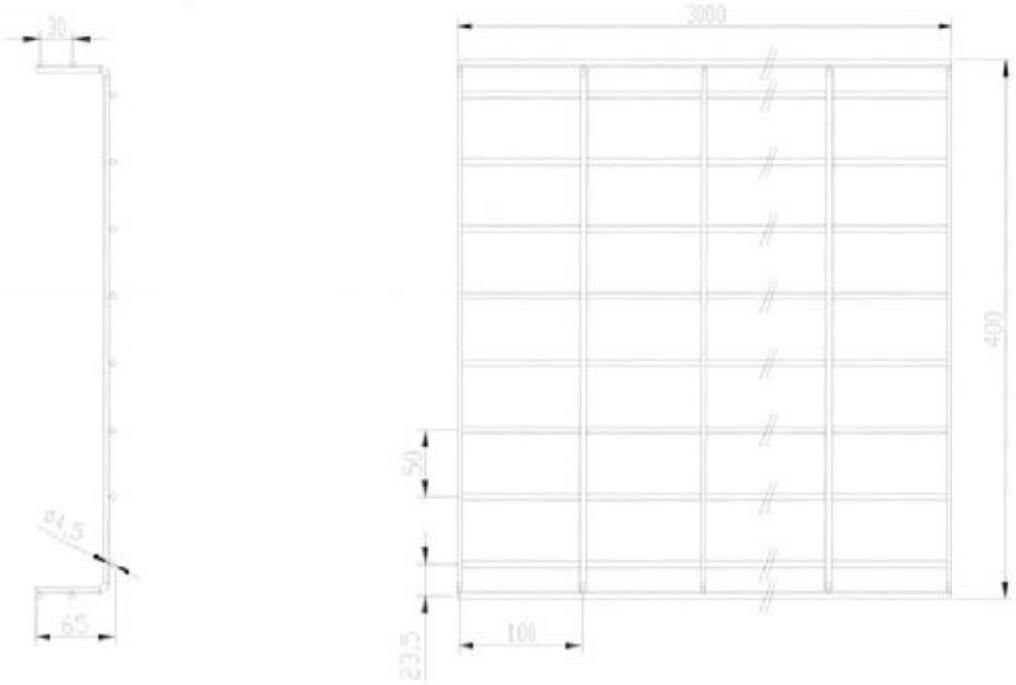
FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

Dátum/Date 13.12.2007

Podpis/Signature

Dokument č./Document No. FIRES-FR-234-07-AWE

Príloha č./Appendix No. 15



FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

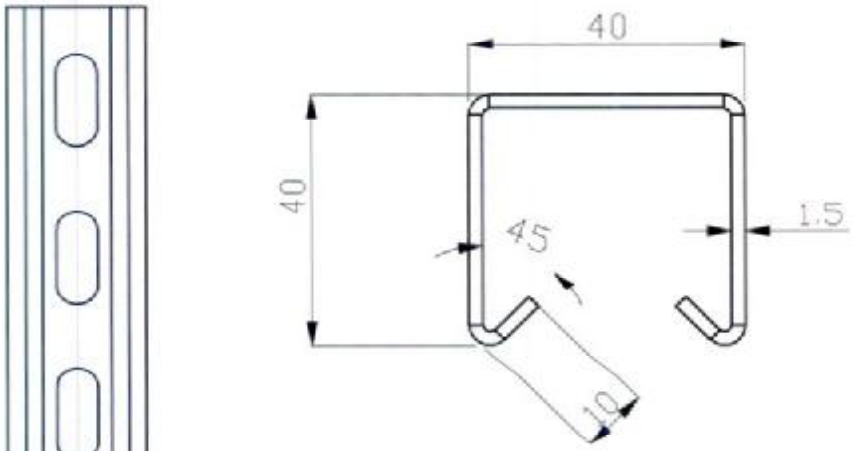
Dátum/Date 13.12.2004
Podpis/Signature

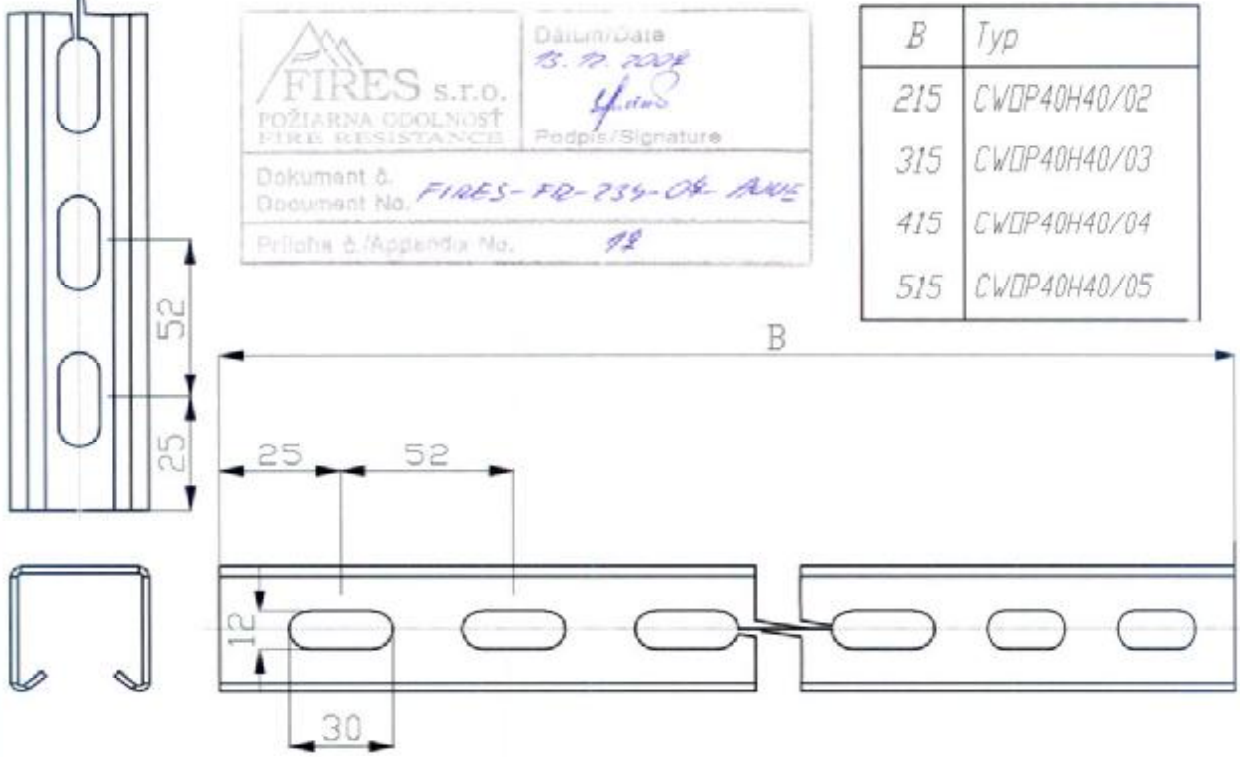
Dokument č.
Document No. FIRES-FR-234-08.AME

Príloha č./Appendix No. 16

Profesjonalne Systemy
Tras Kablowych

KDS□400H60/3





FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

Dátum/Date 13. 11. 2008

Podpis/Signature

Dokument č./Document No. FIRES-FR-234-06-ANNEX

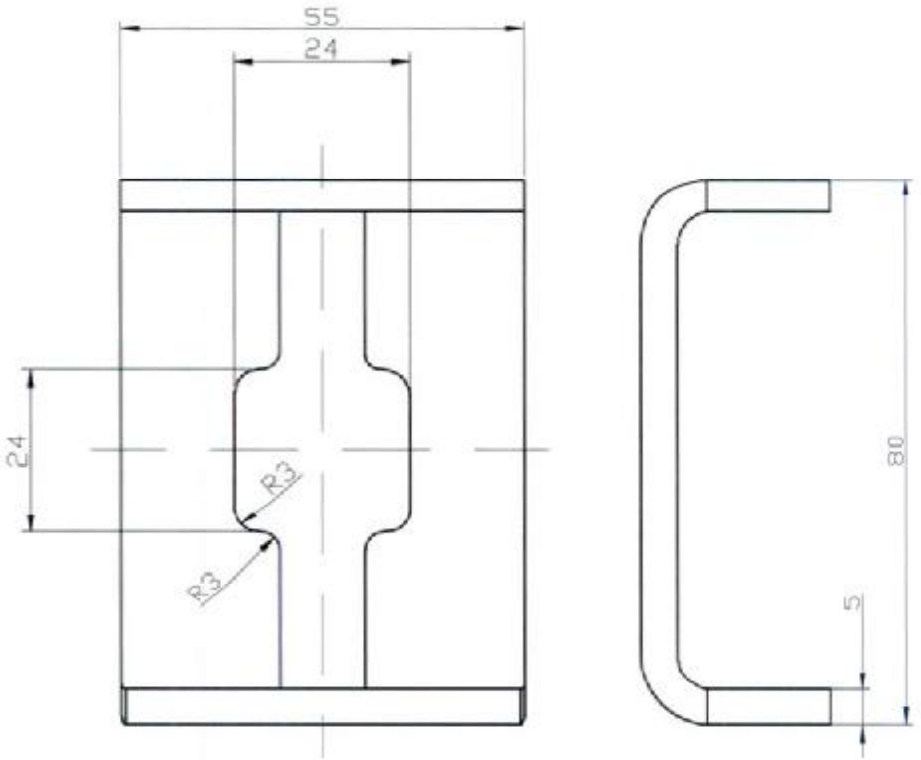
Príloha č./Appendix No. 12

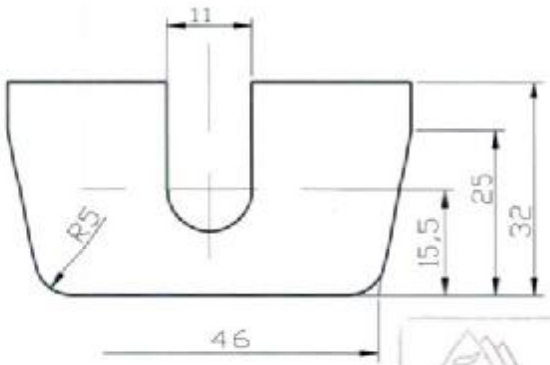
B	Typ
215	CWOP40H40/02
315	CWOP40H40/03
415	CWOP40H40/04
515	CWOP40H40/05

Odchyłka wymiarów nietolerowanych		Materiał	Gatunek		Masa (kg)	Skala 1:2	Format A4	
			Nr normy	PN-EN 10327:2005			Arkuszy	
			półfabrykat (nr normy)				Arkuszy	
Projektował	JGRODCHOWSKI	Nazwisko	Podpis	Data 20.10.05	Nazwa rysunku CWOP40H40/...			
Rysował	J.Grochowski			20.10.05				
Sprawdził	T.WŁODARCZYK			20.10.05				
Zatwierdził	J.KLICZEK			20.10.05			Nr zmiany	

Profesjonalne Systemy Tras Kablowych

Nr rysunku





FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

Dátum/Date 13.12.2004
Podpis/Signature

Dokument č. / Document No.: FIRES-FR-234-04-ANNEX

Príloha č./Appendix No.: 18

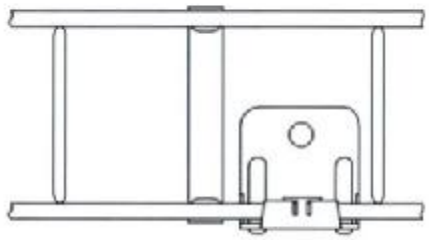
	Dachówka wyniórów nietolerowanych		Materiał	Gatunek		Masa (kg)	Podziałka	Format A4
				Nr normy	PN EN 10327:2005		1:1	Arkusz 1
				półfabrykat (nr normy)				Arkuszy 1

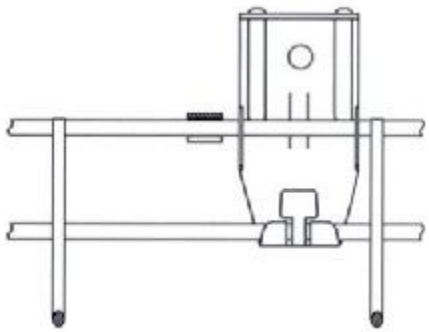
	Nazwisko	Podpis	Data	Nazwa rysunku
Projektował	T.Grudniewski		2004.12.29	USŁUGI
Rysował	J.Jasiński		2004.12.29	
Sprawdził	J.Kliczek		2004.12.29	
Zatwierdził	J.Kliczek		2004.12.29	Nr programu maszynowego ---

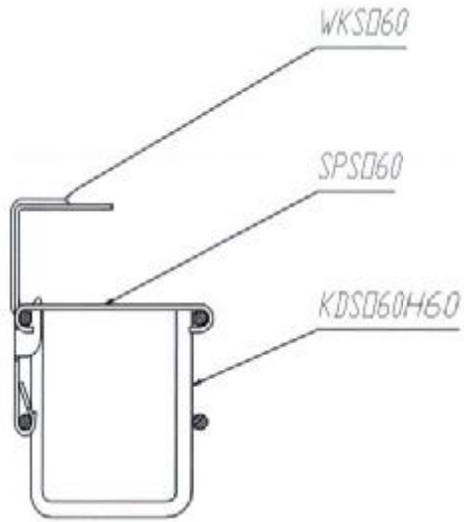
Nr znany

Nr rysunku

Profesjonalne Systemy Tras Kablowych







FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

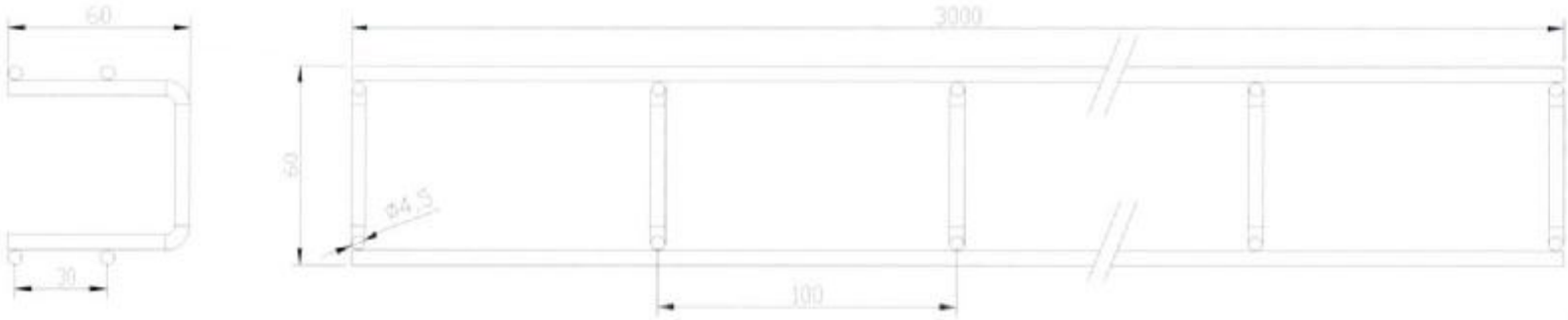
Dátum/Date 15.12.2021

Podpis/Signature

Dokument č./Document No. FIRES-PR-234-01-AVAKI

Príloha č./Appendix No. 49

	Dachówka wymiarowa niemetalowych		Materiał	Gatunek		Masa (kg)	Podziałka	Format A4
				Nr normy			1:1	Arkusz 1
				półfabrykat (nr normy)				Arkuszy 1
Projektował	Nazwisko	Podpis	Data	19122007	Nazwa rysunku	ZAWIESIE DO KDSD60H60		
Rysował								
Sprawdził								
Zatwierdził					Nr programu maszynowego	---		Nr zmiany
	Profesjonalne Systemy Tras Kablowych				Nr rysunku			



FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

Dátum/Date
13. 11. 2008
Podpis/Signature

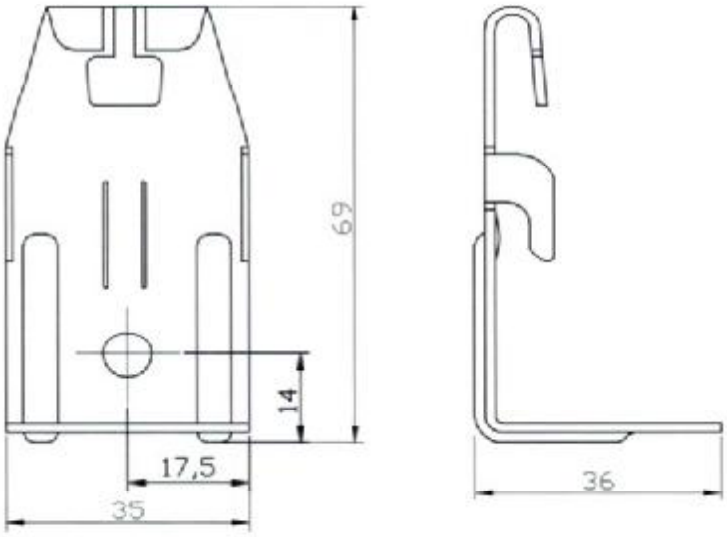
Document č.
Document No. FIRES-FR-234-08-AWE

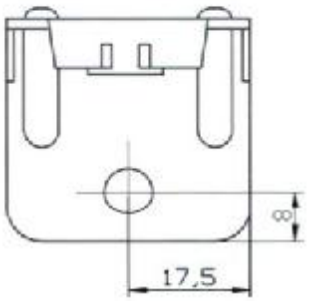
Príloha č./Appendix No. 20

Profesjonalne Systemy
Tras Kablowych

KDSO60H60/3

A4





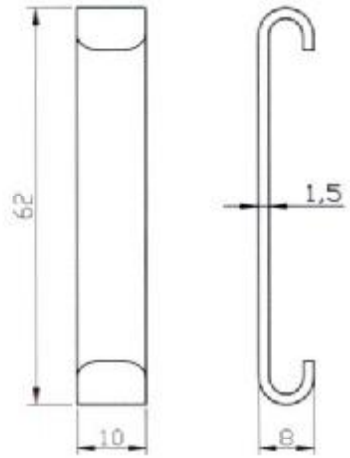
FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

Dátum/Date 13. 11. 2008
Podpis/Signature

Dokument č. / Document No. FIRES-FR-254-08-PAVE

Príloha č./Appendix No. 24

	Dachówka wymiarowa niestokerowanych		Materiał: Gatunek		Masa [kg]	Podziałka 1:1	Format A4	
			Nr normy				Arkusz 1	
			półfabrykat (nr normy)				Arkuszy 1	
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku WKS060				
Rysował								
Sprawdził								
Zatwierdził				Nr programu maszynowego ---			Nr zmiany	
Profesjonalne Systemy Tras Kablowych				Nr rysunku				



FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

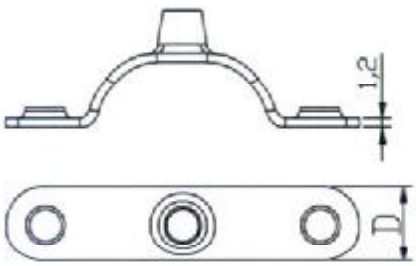
Dátum/Date
13. 11. 2008

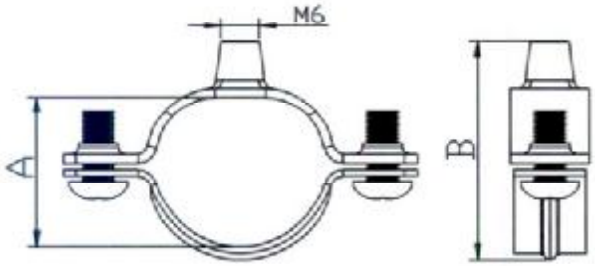
Podpis/Signature

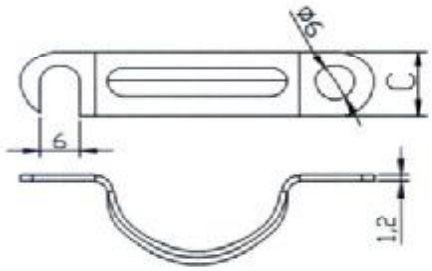
Dokument č./Document No. FIRES-FR-254-08-ANNEX

Príloha č./Appendix No. 22

	Dachy Bks wymiarówki nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka 1:1	Format A4
				Nr normy				Arkusz 1
				półfabrykat (nr normy)				Arkuszy 1
Projektował			Data	10.12.2007	Nazwa rysunku SK060			
Rysował	Nazwisko	Podpis						
Sprawdził								
Zatwierdził					Nr programu maszynowego ---			Nr zmiany
BAKS Profesjonalne Systemy Tras Kablowych					Nr rysunku			







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 nietolerowanych

Materiał: Gatunek; Nr normy; półfabrykat (nr normy)

Masa (kg) | Podziałka 1:1 | Format A4 | Arkusz 1 | Arkuszy 1

	Nazwisko	Podpis	Data
Projektował	J.GRZECHOWSKI		20.10.04
Rysował	J.GRZECHOWSKI		20.10.04
Sprawdził	T.WŁODARCZYK		20.10.04
Zatwierdził	J.KLICZEK		20.10.04

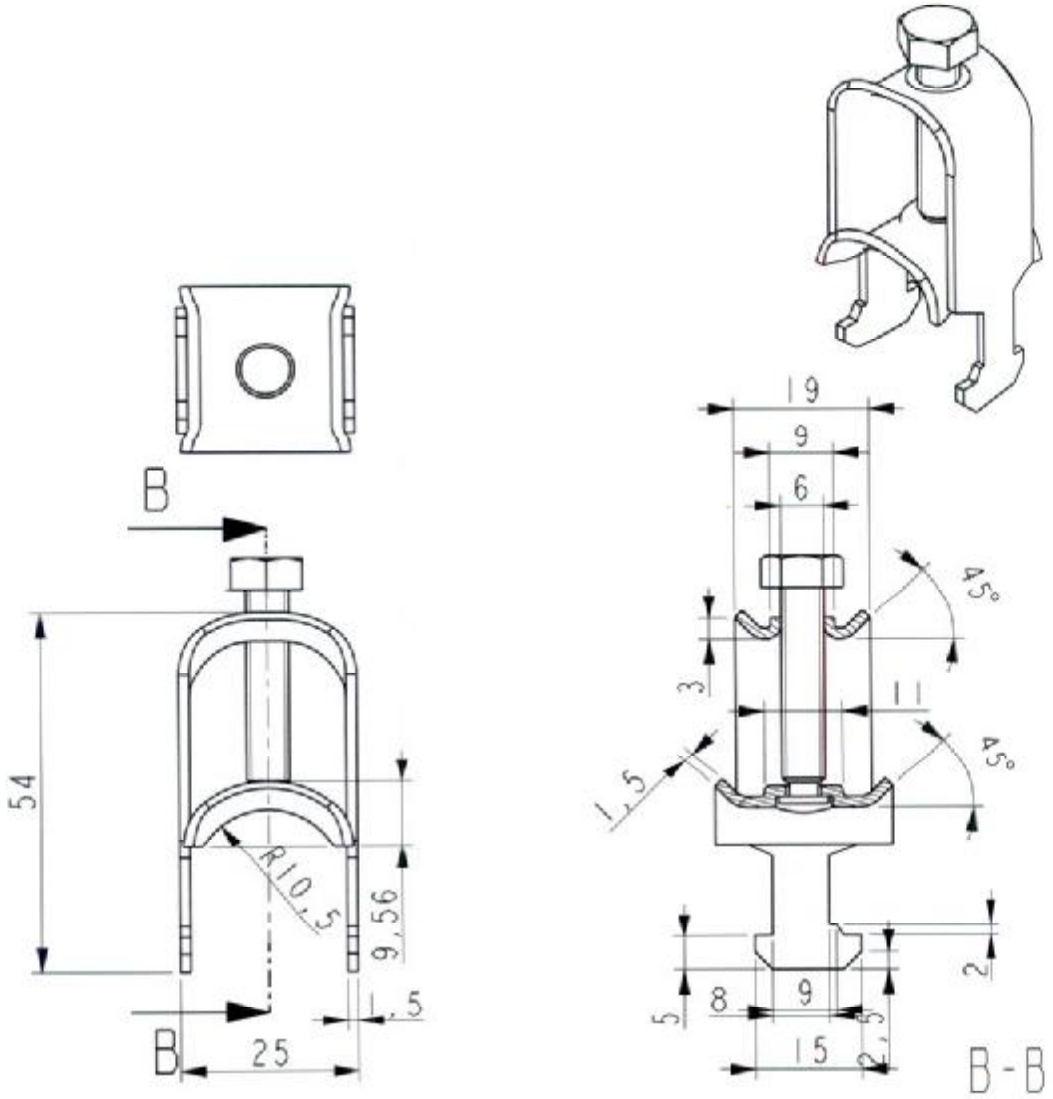
Nazwa rysunku: KSA

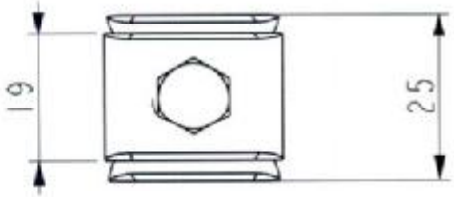
Nr programu maszynowego: ---

Nr zmiany

Profesjonalne Systemy Tras Kablowych

Nr rysunku: ---





FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

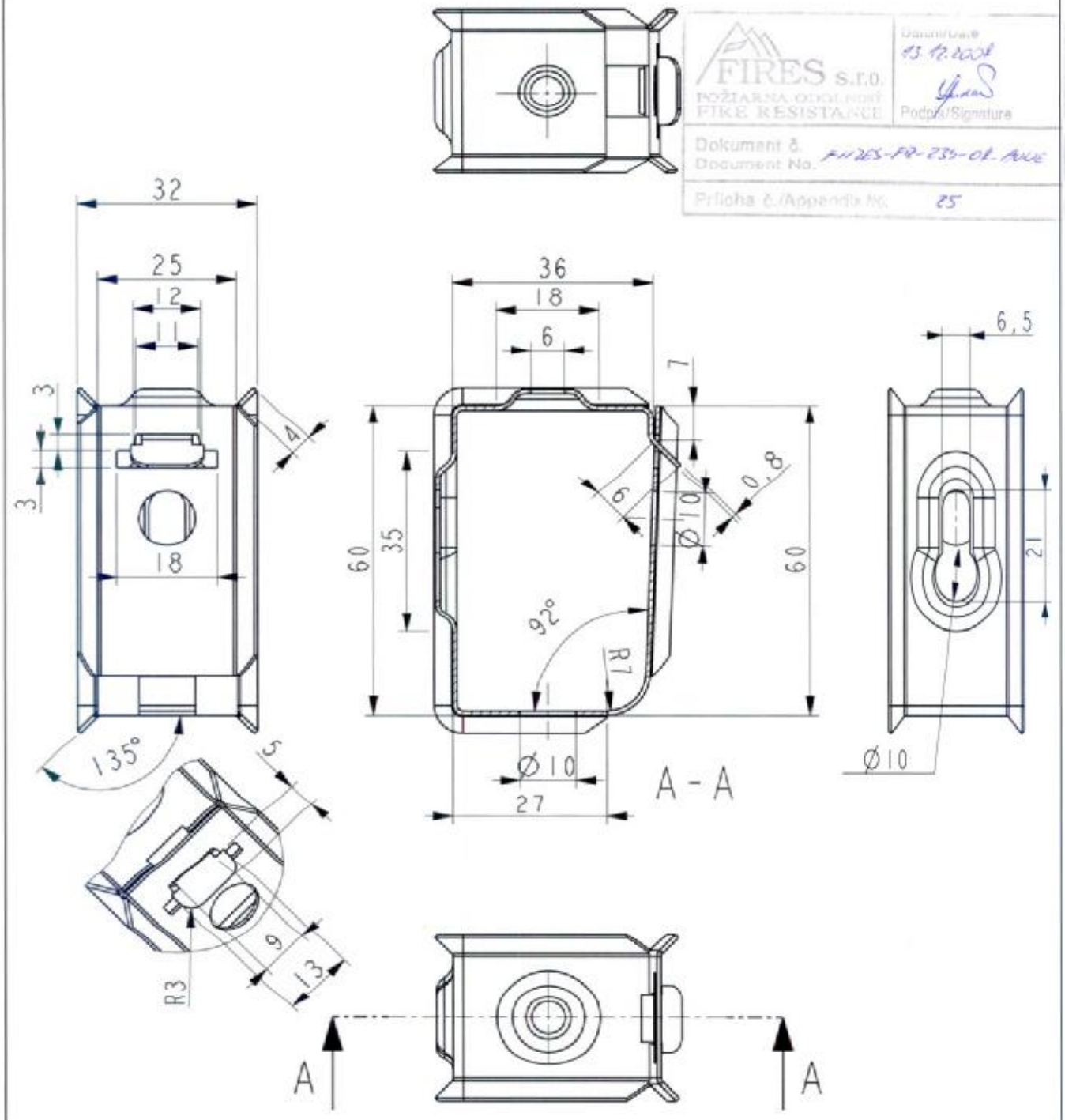
Dátum/Date
15. 12 2004
Podpis/Signature

Dokument č.
Document No. FIRES-FR-234-08-ANE

Príloha č./Appendix No. 24

	Odchylka wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka 1:1	Format A4
				Nr normy	PN-EN 10327:2005			Arkusz 1
				półfabrykat (nr normy)				Arkuszy 1
Projektował				Nazwa rysunku				
Rysował	Nazwisko J.Grochowski	Podpis	Data 28-Jun-06					
Sprawdził				Nr programu maszynowego				Nr zmiany
Zatwierdził				Nr rysunku				

Profesjonalne Systemy Tras Kablowych



FIRES s.r.o.
POŽIARNA ODOLNOSŤ
FIRE RESISTANCE

Dátum/Date 13.12.2004
Podpis/Signature

Dokument č. / Document No. FIRES-FR-235-01-ALU

Príloha č./Appendix No. 25

Odchyłka wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	Format A4
			Nr normy	PN-EN 10142 + A1 : 1997		1:1	Arkusz
			półfabrykat (nr normy)				Arkuszy
Projektował				Nazwa rysunku			
Rysował	Nazwisko J.Grochowski	Podpis	Data	OZMO			
Sprawdził							
Zatwierdził				Nr programu sterującego			Nr zmiany

BAT Profesjonalne Systemy Tras Kablowych