FIRES
The Experts On Fire Safety

TEST REPORT FIRES-FR-196-11-AUNE

Cable bearing system BAKS with cables business Tele-Fonika Kable

Reg. No. 041/S-159

The Experts on Fire Safety

TEST REPORT

FIRES-FR-196-11-AUNE

Tested property:	Function in fire
Test method:	DIN 4102 – 12:1998-11
Date of issue:	26. 10. 2011
Name of the product:	Cable bearing system BAKS with cables business Tele-Fonika Kable
Manufacturer:	BAKS Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew, Poland - producer of construction Tele-Fonika Kable sp. z o.o. S.K.A., ul. Wielicka 114, 30-630 Kraków, Poland – producer of cables
Sponsor:	BAKS Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew, Poland
Task No.:	PR-11-0285
Specimens received:	22. 09. 2011
Date of the test:	29. 09. 2011

Technician responsible for the technical side of this report: Bc. Dávid Šubert

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1. INTRODUCTION

This test report contains the results of test carried out by testing laboratory of FIRES, s.r.o. in Batizovce. The purpose of the test was acquirement of information for product classification.

Representatives from the sponsor's side witnessing the test:

Mr. Jacek Kliczek	BAKS Kazimierz Sielski
Mr. Tomasz Lewandowski	BAKS Kazimierz Sielski
Mr. Remigiusz Matejuk	Control System
Tomasz Drobnicki	Control System
Mrs. Marek Kaczkowski	Tele-Fonika Kable
Mr. Tomasz Zdechlik	Tele-Fonika Kable

test directed by	Ing. Štefan Rástocký
test carried out by	Miroslav Hudák
operator	Ing. Samuel Skokan

2. MEASURING EQUIPMENT

Identification number	Measuring equipment	Note
F 90 004	Vertical test furnace for fire resistance testing	-
F 69 010	PLC system for data acquisition and control TECOMAT TC 700	-
F 40 017	Control and communication software to PLC TECOMAT TC 700	-
F 40 018	SW Reliance	-
F 40 019	Visual and calculating software to PLC TECOMAT TC 700	-
F 40 020	Driver Tecomat – Reliance (SW)	-
F 69 009	PLC system for data acquisition and climate control TECOMAT TC 604	-
F 60 001 - F 60 009	Sensors of temperature and relative air humidity	climatic conditions measuring
F 71 008, F 71 009	Transducer of differential pressure (–50 to + 150) Pa	pressure inside the test furnace
F 10 521 - F 10 528	Plate thermometers	temperature inside the test furnace, according to EN 1363-1
F 10 701	Sheathed thermocouple type K Ø 3 mm	ambient temperature
F 54 020	Digital calliper (0 to 200) mm	-
F 54 059	Racking meter	-
F 57 007	Digital stop-watch	-
F 96 015	Test signal panel	-

3. PREPARATION OF THE SPECIMENS

Testing laboratory didn't take off individual components of the specimens. 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 and mounting of cables and weights into the supporting system was carried out by workers of BAKS Kazimierz Sielski and Tele-Fonika Kable under supervision of laboratory technician.

4. PREPARATION OF THE TEST

4.1 DESCRIPTION OF THE SPECIMENS STRUCTURE

Test specimen comprised from cable bearing system BAKS Kazimierz Sielski – cable trays, cable mesh trays, cable ladders, cable clips with accessories and power and communication halogen free cables of Tele-Fonika Kable company.

Cables

Used cables by test:	NHXH FE 180 PH90/E90 1x 240 RM	(6 x)
	NHXH FE 180 PH90/E90 1x 50 RM	(6 x)
	NHXH FE 180 PH90/E90 5x 50 RM	(2 x)
	(N)HXCH FE 180 PH90/E90 4x 50/25 RM	(8 x)
	NHXCH FE 180 PH90/E90 4x 1,5/1,5 RE	(8 x)
	NHXH-J FE 180 PH90/E90 4x 50 RM	(12 x)
	(N)HXH-J FE 180 PH90/E90 4x 1,5 RE	(12 x)
	NHXCH FE 180 PH90/E90 4x 50/25 RM	(6 x)
	(N)HXH FE 180 PH90/E90 4x 1,5 RE	(2 x)
	(N)HXCH FE 180 PH90/E90 4x 1,5/1,5 RE	(4 x)
	JE-H(St)H FE180 PH90/E30-E90 1x2x0,8 mm	(16 x)
	HDGs FE180 FE180 PH90/E30-E90 2x1,0 mm^2	(16 x)
	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm	(16 x)

The length of cables was 5,5 m, 4 m from that was exposed to fire.

Power and communication halogen free cables were fixed on the ladders by steel clips according to the cable diameter in the points of allowed bending radius.
Power and communication halogen free cables were not fixed in the trays by steel clips in the points of allowed bending radius. They were fixed only by plastic clips.

Cable bearing systems were made of following constructions:

Suspension tracks No. 1, 2, 3, 4, 5 and 6
Tracks were made by three consoles combined of three horizontal supports (type CWOP40H40-L) and three threaded rods (type PGM10) fixed by washers (type PW10) and nuts (type NSM10) which were fixed to ceiling by three dowels (type TRSO M10x40) in spacing of 1500 mm.

Trays (type KCOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm) were laid at both lowest consoles and jointed together by two junctions on sides (type LPOPH60N-L) and steel sheet on the bottom of the tray (type BLO600N-L) and by screws (type SGNM6x12).

Ladders (type DGOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm, pacing of transoms 150 mm) were laid at central and upper consoles by clips (type ZMO) and jointed together by steel sheets (type LDOPCH60N) with screws (type SGNM8x14).

Trays were loaded with 10 $kg.m^{-1}$ and ladders were loaded with 20 $kg.m^{-1}$.
All bearing systems were from steel, galvanized according to the Sendzimir method PN-EN 10327:2005.

Suspension tracks No. 7, 8, 9 and 10
Tracks were made of three consoles (type WPCOE700) which were fixed to ceiling by dowels (type PSROM 10x80) in spacing of 1500 mm. Four booms (type WWCTO 400) were fixed by screws (type SMM 10x80) at each console.

Ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, pacing of transoms 150 mm) were laid at both lower horizontal supports by clips (type ZMO) and jointed together by steel sheets (type LDOPCH60N) with screws (type SGNM 8x12).

Trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm) were laid at both upper horizontal supports and jointed together by two junctions on sides (type LPOPH60N) and steel sheet on the bottom of the tray (type BLO600N) and by screws (type SGNM6x12).

Trays were loaded with 10 $kg.m^{-1}$ and ladders were loaded with 20 $kg.m^{-1}$.
All bearing systems were from steel, galvanized according to the Sendzimir method PN-EN 10327:2005.

Suspension tracks No. 11
Ceiling holders (type UDF) were fixed to ceiling by dowels (type SRO M6x30) in spacing of 600 mm.

Suspension track No. 12
Ceiling holders (type KSA) were fixed to ceiling by dowels (type SRBO M6x30) in spacing of 600 mm.

Suspension track No. 13
Ceiling holders (type OZO) were fixed to ceiling by dowels (type SRO M6x30) in spacing of 600 mm.

Suspension track No. 14
Ceiling holders (type OZMO) were fixed to ceiling by threaded rods (type PG M6) and by dowels (type TRSO M6x30) in spacing of 600 mm.

Suspension track No. 15
Holders (type UDF) were fixed to wall of the furnace by steel screws (type SBO 5x50).

More detailed information about construction of specimens is shown in the drawings which form an integral part of this test report. Drawings were delivered by sponsor.

All the information about technical specifications of used materials and semi-products, information about their type sign were delivered by sponsor. This information was not subject of the inspection of specimens. Parameters which were checked are quoted in paragraph 4.3.

4.2 DESCRIPTION OF SPECIMENS FIXATION

The test specimens were 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's fixation into the test furnace is shown in drawing documentation and it was selected by the sponsor.

4.3 INSPECTION OF SPECIMENS

Before and after the function in fire test, conformity of drawings and test specimens was checked. Specimens corresponded to the drawings which are part of this test report. Inspection of specimens consisted of visual review of the test specimens, used materials as well as size verification (number and cross sections of conductors, thickness, measurements of cables and trays) and also the way of specimens fixation to supporting construction was subject of inspection.

4.4 CLIMATIC CONDITIONING OF SPECIMENS

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

Ambient air temperature [°C]

mean	22,9
standard deviation	0,5

Relative air humidity [%]

mean	49,7
standard deviation	4,8

The humidity equilibrium state of test specimens was not determined. Test specimens did not comprise hygroscopic materials.

5. CARRYING OUT OF THE TEST

5.1 TEST GENERALLY

The test was carried out in horizontal test furnace with dimensions of (4000 x 3000 x 3000) mm (length x width x height).

5.2 CONDITIONS OF THE TEST

Conditions in the test furnace (temperature – standard temperature/time curve, pressure, content of O_2) as well as in the testing room (ambient temperature) corresponded to EN 1363-1 during the test. Detailed information is part of this test report, or in Quality records of the testing laboratory.

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

Date of the test	Relative air humidity [%]	Ambient air temperature [°C]
29. 09. 2011	42,8	19,2

5.3 RESULTS OF THE TEST

Measured values are stated in this test report.

6. CLOSING

Evaluation of the test:

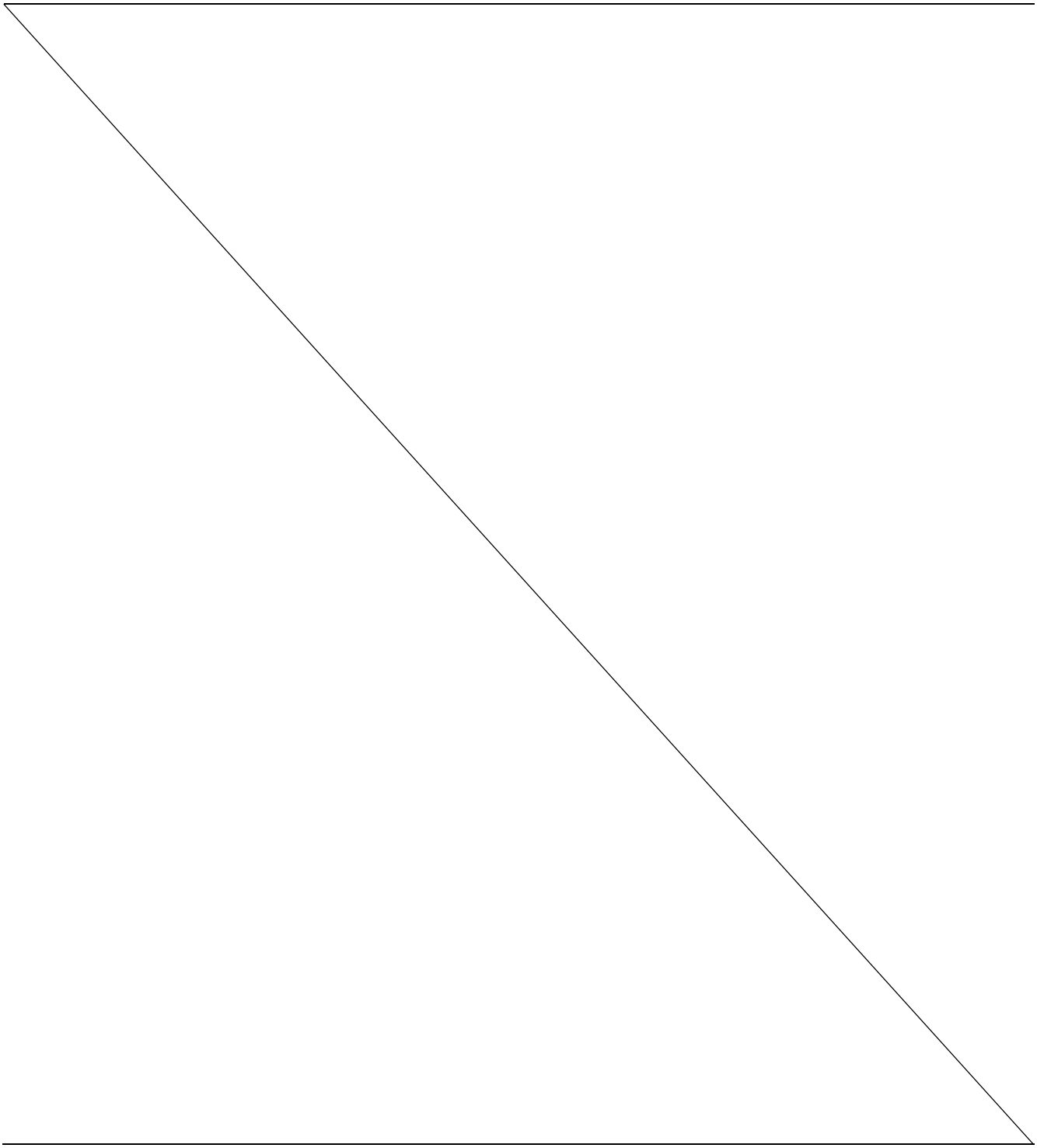
Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
1	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	10	90 minutes no failure / interruption
2	2 cables NHXH-J FE180 PH90/E90 4x50 RM	10	90 minutes no failure / interruption
3	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	8	90 minutes no failure / interruption
4	2 cables NHXH-J FE180 PH90/E90 4x50 RM	8	90 minutes no failure / interruption
5	2 cables (N)HXCH FE180 PH90/E90 4x1,5/1,5 RE	13	90 minutes no failure / interruption
6	2 cables NHXCH FE180 PH90/E90 4x50 /25 RM	13	90 minutes no failure / interruption
7	2 cables (N)HXCH FE180 PH90/E90 4x1,5/1,5 RE	9	85 minutes
8	cable NHXCH FE180 PH90/E90 4x50 /25 RM	9	90 minutes no failure / interruption
9	cable NHXCH FE180 PH90/E90 4x50 /25 RM	9	90 minutes no failure / interruption
10	cable (N)HXH FE180 PH90/E90 4x1,5 RE	7	90 minutes no failure / interruption
11	cable (N)HXH FE180 PH90/E90 4x1,5 RE	7	90 minutes no failure / interruption
12	cable NHXCH FE180 PH90/E90 4x50/25 RM	7	90 minutes no failure / interruption
13	cable NHXCH FE180 PH90/E90 4x50/25 RM	7	90 minutes no failure / interruption
14	cable (N)HXH-J FE180 PH90/E90 4x1,5 RE	12	90 minutes no failure / interruption
15	cable (N)HXH-J FE180 PH90/E90 4x1,5 RE	12	90 minutes no failure / interruption
16	cable NHXCH FE180 PH90/E90 4x1,5/1,5 RE	12	90 minutes no failure / interruption
17	cable NHXCH FE180 PH90/E90 4x1,5/1,5 RE	12	90 minutes no failure / interruption
18	cable NHXH-J FE180 PH90/E90 4x50 RM	12	90 minutes no failure / interruption
19	cable NHXH-J FE180 PH90/E90 4x50 RM	12	90 minutes no failure / interruption
20	cable (N)HXCH FE180 PH90/E90 4x50/25 RM	12	74 minutes
21	cable (N)HXCH FE180 PH90/E90 4x50/25 RM	12	72 minutes
22	cable (N)HXH-J FE180 PH90/E90 4x1,5 RE	6	90 minutes no failure / interruption
23	cable (N)HXH-J FE180 PH90/E90 4x1,5 RE	6	88 minutes
24	cable NHXH-J FE180 PH90/E90 4x50 RM	6	90 minutes no failure / interruption
25	cable NHXH-J FE180 PH90/E90 4x50 RM	6	90 minutes no failure / interruption
26	cable (N)HXH-J FE180 PH90/E90 4x1,5 RE	4	90 minutes no failure / interruption
27	cable (N)HXH-J FE180 PH90/E90 4x1,5 RE	4	90 minutes no failure / interruption
28	cable NHXH-J FE180 PH90/E90 4x50 RM	4	90 minutes no failure / interruption
29	cable NHXH-J FE180 PH90/E90 4x50 RM	4	90 minutes no failure / interruption
30	cable NHXH FE180 PH90/E90 5x50 RM	2	11 minutes
31	3 cables NHXH FE180 PH90/E90 1x50 RM	2	90 minutes no failure / interruption
32	3 cables NHXH FE180 PH90/E90 1x240 RM	2	90 minutes no failure / interruption
33	cable NHXCH FE180 PH90/E90 4x1,5/1,5 RE	5	90 minutes no failure / interruption
34	cable NHXCH FE180 PH90/E90 4x1,5/1,5 RE	5	90 minutes no failure / interruption
35	cable (N)HXCH FE180 PH90/E90 4x50/25 RM	5	90 minutes no failure / interruption

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
36	cable (N)HXCH FE180 PH90/E90 4x50/25 RM	5	90 minutes no failure / interruption
37	cable NHXCH FE180 PH90/E90 4x1,5/1,5 RE	3	90 minutes no failure / interruption
38	cable NHXCH FE180 PH90/E90 4x1,5/1,5 RE	3	90 minutes no failure / interruption
39	cable (N)HXCH FE180 PH90/E90 4x50/25 RM	3	90 minutes no failure / interruption
40	cable (N)HXCH FE180 PH90/E90 4x50/25 RM	3	90 minutes no failure / interruption
41	cable NHXH FE180 PH90/E90 5x50 RM	1	24 minutes
42	3 cables NHXH FE180 PH90/E90 1x50 RM	1	90 minutes no failure / interruption
43	3 cables NHXH FE180 PH90/E90 1x240 RM	1	90 minutes no failure / interruption
44	cable (N)HXH-J FE180 PH90/E90 4x1,5 RE	11	90 minutes no failure / interruption
45	cable (N)HXH-J FE180 PH90/E90 4x1,5 RE	11	90 minutes no failure / interruption
46	cable NHXCH FE180 PH90/E90 4x1,5/1,5 RE	11	90 minutes no failure / interruption
47	cable NHXCH FE180 PH90/E90 4x1,5/1,5 RE	11	90 minutes no failure / interruption
48	cable NHXH-J FE180 PH90/E90 4x50 RM	11	90 minutes no failure / interruption
49	cable NHXH-J FE180 PH90/E90 4x50 RM	11	90 minutes no failure / interruption
50	cable (N)HXCH FE180 PH90/E90 4x50/25 RM	11	90 minutes no failure / interruption
51	cable (N)HXCH FE180 PH90/E90 4x50/25 RM	11	90 minutes no failure / interruption
52A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	15	90 minutes no failure / interruption
52B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	15	90 minutes no failure / interruption
53	2 cables HTKSHekw FE180 PH90/E30-E90 2x2x0,8 mm	15	90 minutes no failure / interruption
54A	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	15	90 minutes no failure / interruption
54B	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	15	90 minutes no failure / interruption
55A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	14	90 minutes no failure / interruption
55B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	14	90 minutes no failure / interruption
56	2 cables HTKSHekw FE180 PH90/E30-E90 2x2x0,8 mm	14	90 minutes no failure / interruption
57A	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	14	90 minutes no failure / interruption
57B	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	14	90 minutes no failure / interruption
58A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	10	90 minutes no failure / interruption
58B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	10	90 minutes no failure / interruption
59A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	8	90 minutes no failure / interruption
59B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	8	90 minutes no failure / interruption
60	2 cables HTKSHekw FE180 PH90/E30-E90 2x2x0,8 mm	9	90 minutes no failure / interruption
61A	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	9	90 minutes no failure / interruption
61B	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	9	90 minutes no failure / interruption
62	2 cables HTKSHekw FE180 PH90/E30-E90 2x2x0,8 mm	7	90 minutes no failure / interruption
63A	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	7	90 minutes no failure / interruption
63B	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	7	90 minutes no failure / interruption
64A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	12	90 minutes no failure / interruption
64B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	12	90 minutes no failure / interruption
65	2 cables HTKSHekw FE180 PH90/E30-E90 2x2x0,8 mm	12	90 minutes no failure / interruption
66A	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	12	90 minutes no failure / interruption
66B	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	12	90 minutes no failure / interruption
67A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	6	90 minutes no failure / interruption
67B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	6	90 minutes no failure / interruption
68A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	4	90 minutes no failure / interruption
68B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	4	90 minutes no failure / interruption
69A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	11	90 minutes no failure / interruption
69B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	11	90 minutes no failure / interruption
70	2 cables HTKSHekw FE180 PH90/E30-E90 2x2x0,8 mm	11	90 minutes no failure / interruption
71A	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	11	90 minutes no failure / interruption
71B	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	11	90 minutes no failure / interruption
72	2 cables HTKSHekw FE180 PH90/E30-E90 2x2x0,8 mm	5	90 minutes no failure / interruption
73A	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	5	90 minutes no failure / interruption
73B	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	5	90 minutes no failure / interruption
74	2 cables HTKSHekw FE180 PH90/E30-E90 2x2x0,8 mm	3	90 minutes no failure / interruption

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
75A	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	3	90 minutes no failure / interruption
75B	cable JE-H(st)H FE180 PH90/E30-E90 1x2x0,8 mm	3	90 minutes no failure / interruption

The fire test was discontinued in 96th minute at the request of test 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.
Circuit breakers with rating 3 A were used.

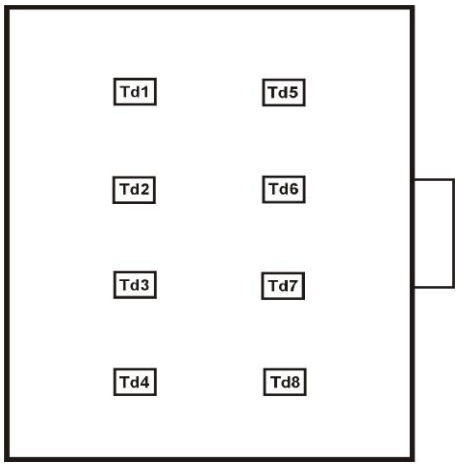


Measured values inside the test furnace

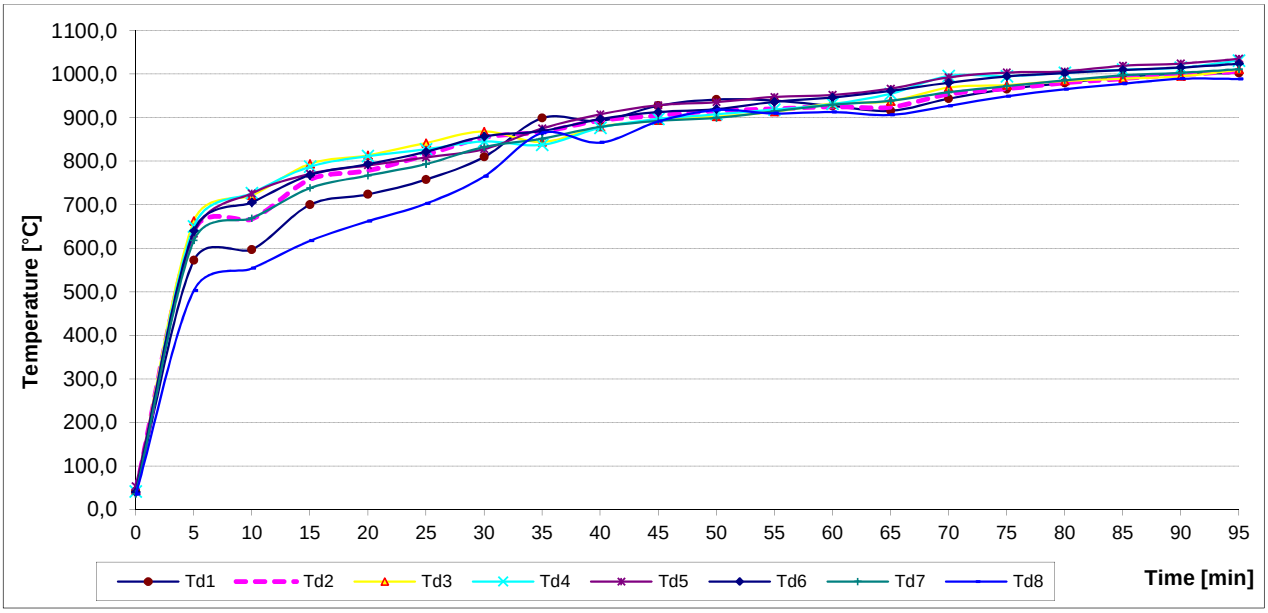
Time	Temperature [°C]											Deviation	Pressure
t [min]	Td1	Td2	Td3	Td4	Td5	Td6	Td7	Td8	Tave	Tn	To	d_e [%]	p [Pa]
0	42,1	44,6	44,1	42,1	54,2	40,4	36,3	35,3	42,4	20,0	23,5	0,0	17,7
5	572,3	640,5	662,9	650,9	633,9	639,8	618,4	503,3	615,3	576,0	23,5	-3,2	18,1
10	597,2	667,1	721,1	726,5	726,2	705,3	669,1	554,0	687,5	678,0	23,0	0,7	19,4
15	700,1	758,3	794,0	787,4	771,0	768,6	738,3	617,3	759,7	739,0	22,2	1,3	19,6
20	723,9	778,5	813,8	811,7	790,6	793,3	767,3	662,3	782,7	781,0	22,1	1,3	18,0
25	758,0	814,5	842,1	827,6	809,0	821,9	793,7	702,8	809,5	815,0	22,0	1,0	17,0
30	809,9	854,6	868,5	845,5	827,9	857,2	832,7	765,1	842,3	842,0	21,7	0,7	17,5
35	899,2	867,8	844,5	837,8	875,4	869,5	852,0	864,9	863,9	865,0	21,8	0,6	19,0
40	892,7	893,9	879,1	877,1	907,8	896,9	878,9	842,8	883,7	885,0	21,8	0,5	18,7
45	927,5	905,1	893,9	897,3	928,7	912,9	892,6	891,4	906,2	902,0	21,6	0,4	19,4
50	941,8	915,9	902,4	907,6	935,7	919,7	899,5	917,6	917,5	918,0	21,5	0,4	17,2
55	939,2	920,4	913,7	918,7	947,9	936,5	914,9	909,8	925,1	932,0	21,4	0,3	19,0
60	927,1	925,2	932,7	931,4	952,1	946,5	929,9	912,9	932,2	945,0	21,5	0,2	18,2
65	915,9	924,2	937,9	955,0	966,9	961,8	938,9	906,5	938,4	957,0	21,5	0,0	18,4
70	943,6	954,2	969,2	996,0	992,6	980,3	958,4	927,3	965,2	968,0	21,5	-0,1	19,3
75	965,6	966,6	974,8	995,3	1003,6	994,9	972,4	949,2	977,8	979,0	21,3	-0,1	18,6
80	979,8	980,0	984,4	1003,1	1006,4	1002,5	985,8	965,2	988,4	988,0	21,3	-0,1	18,3
85	994,1	989,8	989,6	1010,2	1019,2	1009,5	997,3	978,1	998,5	997,0	21,3	-0,1	17,2
90	1001,0	998,7	995,2	1014,8	1024,1	1015,1	1003,1	989,3	1005,2	1006,0	21,2	-0,1	17,7
95	1002,5	1006,5	1010,1	1031,1	1035,4	1024,1	1011,3	988,8	1013,7	1014,0	21,2	-0,1	18,8

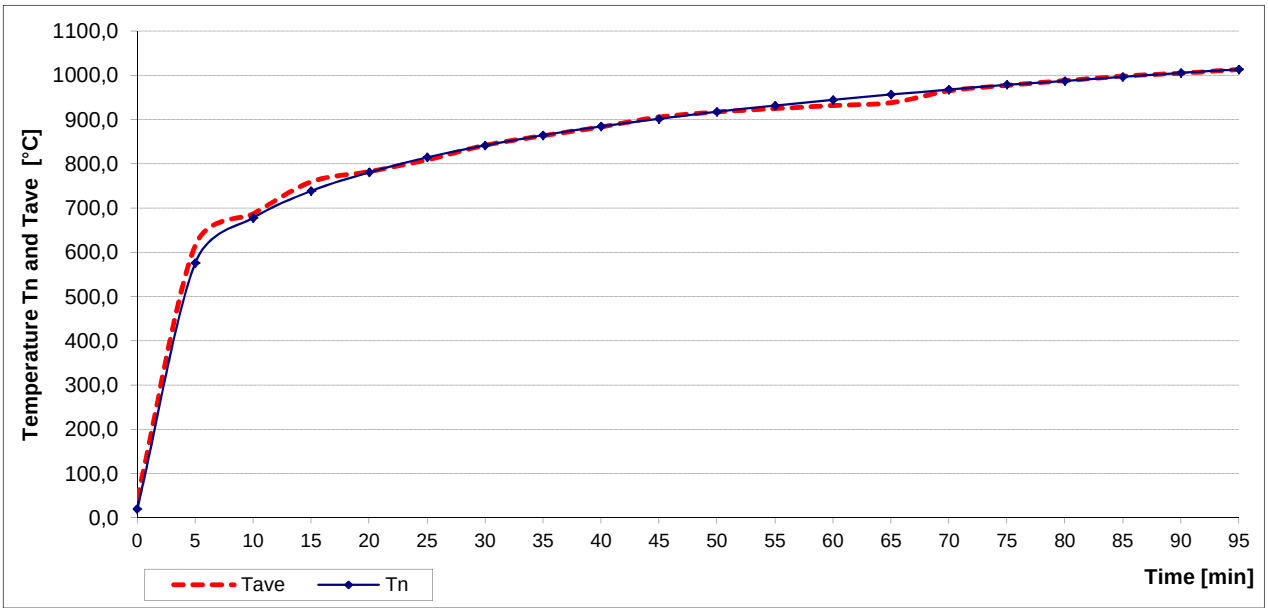
Tave Average temperature in the test furnace calculated from plate thermometers
Tn Standard temperature in the test furnace laid down to test guideline
To Ambient temperature
d_e Deviation of the average temperature from the standard temperature calculated according to test guideline
p Pressure inside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

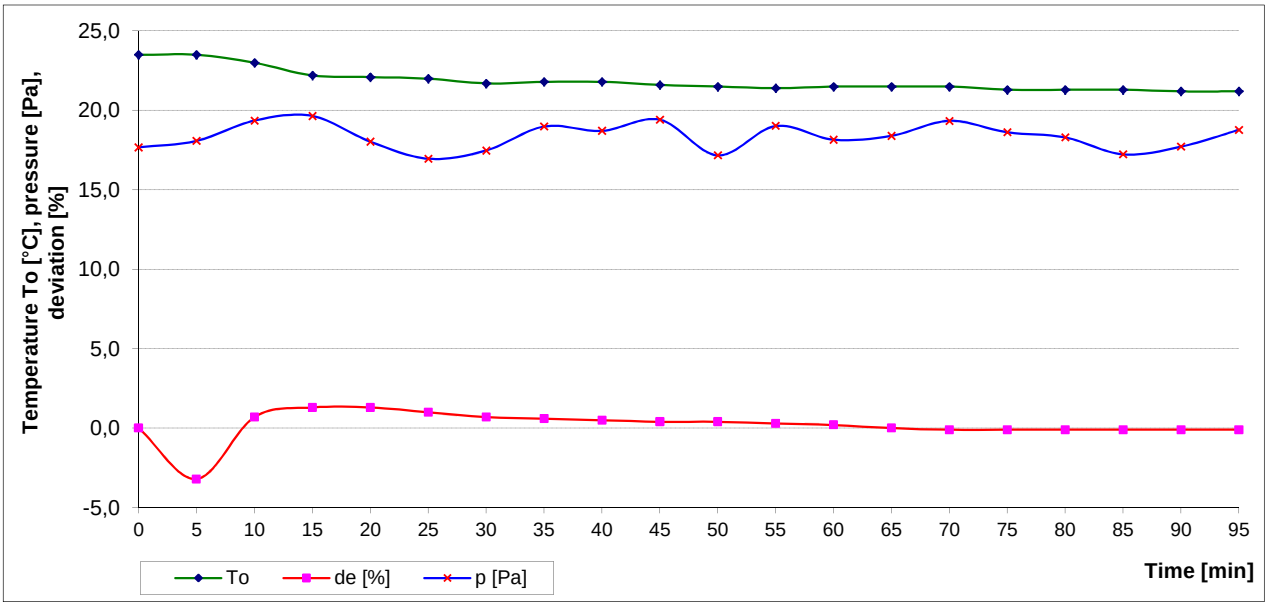
Layout of measuring points inside the test furnace:



Measured values inside the test furnace /graph







Measured time of tested specimens from S1 to S10 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S1	1-L1	94:49
	2-L2	94:49
	3-L3	x
	4-PEN	x
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	85:12
	26-L2	85:12
	27-L3	x
	28-PEN	x
S8	29-L1	no failure / interruption
	30-L2	no failure / interruption
	31-L3	no failure / interruption
	32-PEN	no failure / interruption
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

Specimen No.	Cables
1	(N)HXH-J FE180/E90 1kV 4x1,5
2	NHXH-J FE180/E90 1kV 4x50
3	(N)HXH-J FE180/E90 1kV 4x1,5
4	NHXH-J FE180/E90 1kV 4x50
5	(N)HXCH FE180/E90 1kV 4x1,5/1,5
6	NHXCH FE180/E90 1kV 4x50/25
7	(N)HXCH FE180/E90 1kV 4x1,5/1,5
8	NHXCH FE180/E90 1kV 4x50/25
9	NHXCH FE180/E90 1kV 4x50/25
10	(N)HXH FE180/E90 1kV 4x1,5

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 S11 to S20 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
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
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	x
	78-L2	74:51
	79-L3	x
	80-PEN	x

Specimen No.	Cables
11	(N)HXH FE180/E90 1kV 4x1,5
12	NHXCH FE180/E90 1kV 4x50/25
13	NHXCH FE180/E90 1kV 4x50/25
14	(N)HXH-J FE180/E90 1kV 4x1,5
15	(N)HXH-J FE180/E90 1kV 4x1,5
16	NHXCH FE180/E90 1kV 4x1,5/1,5
17	NHXCH FE180/E90 1kV 4x1,5/1,5
18	NHXH-J FE180/E90 1kV 4x50
19	NHXH-J FE180/E90 1kV 4x50
20	(N)HXCH FE180/E90 1kV 4x50/25

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 S21 to S30 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S21	81-L1	x
	82-L2	x
	83-L3	72:07
	84-PEN	x
S22	85-L1	91:04
	86-L2	91:04
	87-L3	x
	88-PEN	x
S23	89-L1	88:37
	90-L2	88:37
	91-L3	x
	92-PEN	x
S24	93-L1	no failure / interruption
	94-L2	no failure / interruption
	95-L3	no failure / interruption
	96-PEN	no failure / interruption
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	x
	118-L2	11:05
	119-L3	x
	120-PEN	x

Specimen No.	Cables
21	(N)HXCH FE180/E90 1kV 4x50/25
22	(N)HXH-J FE180/E90 1kV 4x1,5
23	(N)HXH-J FE180/E90 1kV 4x1,5
24	NHXH-J FE180/E90 1kV 4x50
25	NHXH-J FE180/E90 1kV 4x50
26	(N)HXH-J FE180/E90 1kV 4x1,5
27	(N)HXH-J FE180/E90 1kV 4x1,5
28	NHXH-J FE180/E90 1kV 4x50
29	NHXH-J FE180/E90 1kV 4x50
30	NHXH FE180/E90 1kV 5x50

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 S31 to S40 - power cables

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

Specimen No.	Cables
31	NHXH FE180/E90 1kV 1x50
32	NHXH FE180/E90 1kV 1x240
33	NHXCH FE180/E90 1kV 4x1,5/1,5
34	NHXCH FE180/E90 1kV 4x1,5/1,5
35	(N)HXCH FE180/E90 1kV 4x50/25
36	(N)HXCH FE180/E90 1kV 4x50/25
37	NHXCH FE180/E90 1kV 4x1,5/1,5
38	NHXCH FE180/E90 1kV 4x1,5/1,5
39	(N)HXCH FE180/E90 1kV 4x50/25
40	(N)HXCH FE180/E90 1kV 4x50/25

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 S41 to S51 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S41	161-L1	24:09
	162-L2	24:09
	163-L3	x
	164-PEN	x
S42	165-L1	no failure / interruption
	166-L2	no failure / interruption
	167-L3	no failure / interruption
	168-PEN	no failure / interruption
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	no failure / interruption
	190-L2	no failure / interruption
	191-L3	no failure / interruption
	192-PEN	no failure / interruption
S49	193-L1	no failure / interruption
	194-L2	no failure / interruption
	195-L3	no failure / interruption
	196-PEN	no failure / interruption
S50	197-L1	no failure / interruption
	198-L2	no failure / interruption
	199-L3	no failure / interruption
	200-PEN	no failure / interruption
S51	201-L1	no failure / interruption
	202-L2	no failure / interruption
	203-L3	no failure / interruption
	204-PEN	no failure / interruption

Specimen No.	Cables
41	NHXH FE180/E90 1kV 5x50
42	NHXH FE180/E90 1kV 1x50
43	NHXH FE180/E90 1kV 1x240
44,45	2 cables (N)HXH-J FE180/E90 1kV 4x1,5
46,47	2 cables NHXCH FE180/E90 1kV 4x1,5/1,5
48,49	2 cables NHXH-J FE180/E90 1kV 4x50
50,51	2 cables (N)HXCH FE180/E90 1kV 4x50/25

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 S61 - communication cables

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
S53	213-L	no failure / interruption
	214-PEN	no failure / interruption
	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
S56	225-L	no failure / interruption
	226-PEN	no failure / interruption
	227-L	no failure / interruption
	228-PEN	no failure / interruption
S57A	229-L	no failure / interruption
	230-PEN	no failure / interruption
S57B	231-L	no failure / interruption
	232-PEN	no failure / interruption
S58A	233-L	no failure / interruption
	234-PEN	no failure / interruption
S58B	235-L	no failure / interruption
	236-PEN	no failure / interruption
S59A	237-L	no failure / interruption
	238-PEN	no failure / interruption
S59B	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
S61A	245-L	no failure / interruption
	246-PEN	no failure / interruption
S61B	247-L	no failure / interruption
	248-PEN	no failure / interruption

Specimen No.	Cables
52	2 cables HDGs FE80/E90 2x1
53	HTKSHekw FE180/E30-E90 PH90 2x2x0,8
54	2 cables JE-H(st)H FE180/E30-E90 PH90 1x2x0,8
55	2 cables HDGs FE80/E90 2x1
56	HTKSHekw FE180/E30-E90 PH90 2x2x0,8
57	2 cables JE-H(st)H FE180/E30-E90 PH90 1x2x0,8
58	2 cables HDGs FE80/E90 2x1
59	2 cables HDGs FE80/E90 2x1
60	HTKSHekw FE180/E30-E90 PH90 2x2x0,8
61	2 cables JE-H(st)H FE180/E30-E90 PH90 1x2x0,8

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 S62 to S71 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S62	249-L	no failure / interruption
	250-PEN	no failure / interruption
	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
S65	261-L	no failure / interruption
	262-PEN	no failure / interruption
	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
S68A	273-L	no failure / interruption
	274-PEN	no failure / interruption
S68B	275-L	no failure / interruption
	276-PEN	no failure / interruption
S69A	277-L	no failure / interruption
	278-PEN	no failure / interruption
S69B	279-L	no failure / interruption
	280-PEN	no failure / interruption
S70	281-L	no failure / interruption
	282-PEN	no failure / interruption
	283-L	no failure / interruption
	284-PEN	no failure / interruption
S71A	285-L	no failure / interruption
	286-PEN	no failure / interruption
S71B	287-L	no failure / interruption
	288-PEN	no failure / interruption

Specimen No.	Cables
62	HTKSHekw FE180/E30-E90 PH90 2x2x0,8
63	2 cables JE-H(st)H FE180/E30-E90 PH90 1x2x0,8
64	2 cables HDGs FE80/E90 2x1
65	HTKSHekw FE180/E30-E90 PH90 2x2x0,8
66	2 cables JE-H(st)H FE180/E30-E90 PH90 1x2x0,8
67	2 cables HDGs FE80/E90 2x1
68	2 cables HDGs FE80/E90 2x1
69	2 cables HDGs FE80/E90 2x1
70	HTKSHekw FE180/E30-E90 PH90 2x2x0,8
71	2 cables JE-H(st)H FE180/E30-E90 PH90 1x2x0,8

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 S72 to S75 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S72	289-L	no failure / interruption
	290-PEN	no failure / interruption
	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
S74	297-L	no failure / interruption
	298-PEN	no failure / interruption
	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

Specimen No.	Cables
72	HTKSHekw FE180/E30-E90 PH90 2x2x0,8
73	2 cables JE-H(st)H FE180/E30-E90 PH90 1x2x0,8
74	HTKSHekw FE180/E30-E90 PH90 2x2x0,8
75	2 cables JE-H(st)H FE180/E30-E90 PH90 1x2x0,8

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.

PHOTOS

Photo taken before the test.

Photo taken before the test.

Photo taken before the test.

PHOTOS

Photo taken before the test.

Photo taken before the test.

Photo taken before the test.

PHOTOS

Photo taken after the test.

Photo taken after the test.

Photo taken after the test.

PHOTOS

Photo taken after the test.

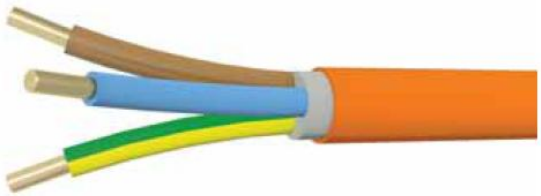
Photo taken after the test.

Photo taken after the test.

FLAMEX 950 (N)HXH FE180/E90 0,6/1 kV

DIN VDE 0266, DIN 4102-12

Halogen-free low smoke fire resistant security power cables



FIRE PERFORMANCE	
Insulation integrity FE 180:	DIN VDE 0472-814 (800°C, 180 min.), IEC 60331-21
System integrity E90:	DIN 4102-12 (90 min.)
Flame propagation:	DIN EN 50266-2-2, VDE 0482-266-2-2, IEC 60332-3-22
Smoke density:	DIN EN 61034-2, VDE 0482-1034-2, IEC 61034-2
Gases evolved during combustion:	DIN EN 50267-2-2, VDE 0482-267-2-2, IEC 60754-2: pH ≥ 4,3; conductivity ≤ 2,5 µS/mm
CONSTRUCTION	
Conductors:	bare copper conductor, circular solid class 1 (RE) or stranded circular or circular compacted class 2 (RM) according to EN 60228
Insulation:	special fire resistant cross-linked compound
Inner covering:	special flame-retardant and halogen-free compound
Sheath:	thermoplastic halogen-free compound type HM4 according to HD 604 S1
Colour of sheath:	orange
CHARACTERISTIC	
Core identification:	according to HD 308 S2 or EN 50334

	(N)HXH-O FE180/E90	(N)HXH-J FE180/E90
	without protective conductor	with protective conductor
1-core:	black	green-yellow
2-core:	blue, brown	—
3-core:	brown, black, grey	green-yellow, blue, brown
4-core:	blue, brown, black, grey	green-yellow, brown, black, grey
5-core:	blue, brown, black, grey, black	green-yellow, blue, brown, black, grey
more 5-core:	black with numbering	green-yellow, others cores black with numbering

Maximum conductor operating temperature:	+90°C
Lowest ambient temperature for fixed installation:	-30°C
Lowest installation temperature:	-5°C
Maximum short-circuit conductor temperature:	+250°C
Minimum bending radius:	15D - for single core cable; 12D - for multicore cable (D - overall cable diameter)
Maximum permissible tensile stress with cable grip for Cu-conductor:	50 N/mm²
Application:	Fire resistant security cables for installation everywhere where high safety requirements have a special significance e.g., in industrial complexes, power stations, public buildings, hotels, underground railway systems, hospitals etc.
Standard packing:	500 m on drums. Other forms of packing and delivery are available on request.

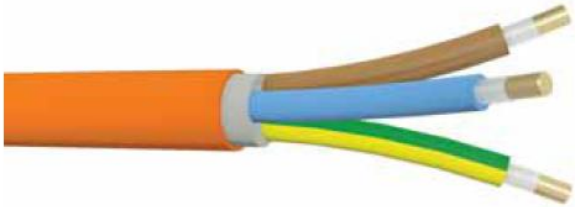
Number and cross-sectional area of conductor			Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at 20°C
n x mm²			mm	kg/km	W/km
1	x	1,5RE	7,4	71	12,1
1	x	2,5RE	7,7	84	7,41
1	x	4RE	8,2	103	4,61
1	x	6RE	8,7	125	3,08
1	x	10RE	9,5	170	1,83
1	x	16RM	10,8	240	1,15
1	x	25RM	12,5	347	0,727
1	x	35RM	13,6	446	0,524
1	x	50RM	15,5	590	0,387
1	x	70RM	17,0	801	0,268
1	x	95RM	19,8	1094	0,193
1	x	120RM	21,2	1333	0,153
1	x	150RM	23,6	1643	0,124
1	x	185RM	25,7	2023	0,0991
1	x	240RM	29,0	2609	0,0754
1	x	300RM	31,6	3237	0,0601
1	x	400RM	36,2	4183	0,0470
2	x	1,5RE	14,1	268	12,1
2	x	2,5RE	14,9	310	7,41
2	x	4RE	15,8	367	4,61
2	x	6RE	16,8	435	3,08
2	x	10RE	18,4	562	1,83
2	x	16RM	21,0	776	1,15
2	x	25RM	24,4	1098	0,727
3	x	1,5RE	14,8	296	12,1
3	x	2,5RE	15,6	347	7,41
3	x	4RE	16,6	417	4,61
3	x	6RE	17,7	503	3,08
3	x	10RE	19,4	665	1,83
3	x	16RM	22,2	932	1,15
3	x	25RM	25,9	1337	0,727
3	x	35RM	28,2	1694	0,524
3	x	50RM	32,8	2296	0,387
3	x	70RM	36,0	3025	0,268
3	x	95RM	41,6	4106	0,193
3	x	120RM	45,1	5002	0,153
3	x	150RM	50,3	6177	0,124
3	x	185RM	55,4	7643	0,0991
3	x	240RM	62,5	9825	0,0754
4	x	1,5RE	16,0	345	12,1
4	x	2,5RE	16,9	407	7,41
4	x	4RE	18,0	495	4,61
4	x	6RE	19,2	603	3,08
4	x	10RE	21,1	809	1,83
4	x	16RM	24,3	1144	1,15

Number and cross-sectional area of conductor			Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at 20°C
n x mm²			mm	kg/km	W/km
4	x	25RM	28,4	1655	0,727
4	x	35RM	31,2	2126	0,524
4	x	50RM	36,3	2879	0,387
4	x	70RM	39,8	3815	0,268
4	x	95RM	46,6	5240	0,193
4	x	120RM	50,1	6355	0,153
4	x	150RM	56,2	7879	0,124
4	x	185RM	61,4	9683	0,0991
4	x	240RM	69,5	12491	0,0754
5	x	1,5RE	17,3	402	12,1
5	x	2,5RE	18,3	478	7,41
5	x	4RE	19,6	586	4,61
5	x	6RE	20,9	717	3,08
5	x	10RE	23,0	969	1,83
5	x	16RM	26,6	1380	1,15
5	x	25RM	31,4	2022	0,727
5	x	35RM	34,6	2619	0,524
5	x	50RM	40,2	3525	0,387
5	x	70RM	44,2	4705	0,268
5	x	95RM	51,5	6428	0,193
5	x	120RM	55,9	7867	0,153
5	x	150RM	62,3	9701	0,124
5	x	185RM	68,4	11968	0,0991
5	x	240RM	77,4	15444	0,0754
7	x	1,5RE	18,7	472	12,1
7	x	2,5RE	19,8	569	7,41
7	x	4RM	22,1	751	4,61
8	x	1,5RE	20,0	523	12,1
10	x	1,5RE	23,2	659	12,1
10	x	1,5RM	24,0	694	12,1
10	x	2,5RE	24,8	801	7,41
12	x	1,5RE	23,9	721	12,1
12	x	2,5RE	25,5	882	7,41
14	x	1,5RE	25,1	798	12,1
14	x	2,5RE	26,8	982	7,41
19	x	1,5RE	27,8	992	12,1
19	x	2,5RE	30,1	1263	7,41
20	x	1,5RE	29,4	1079	12,1
20	x	1,5RM	30,4	1135	12,1

Number and cross-sectional area of conductor			Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at 20°C
n x mm²			mm	kg/km	W/km
24	x	2,5RE	35,4	1612	7,41
30	x	1,5RE	35,0	1510	12,1
30	x	2,5RE	37,5	1885	7,41
3	x	25RM+16RM	27,6	1561	0,727 / 1,15
3	x	35RM+16RM	29,5	1917	0,524 / 1,15
3	x	50RM+25RM	34,5	2631	0,387 / 0,727
3	x	70RM+35RM	37,8	3461	0,268 / 0,524
3	x	95RM+50RM	44,1	4742	0,193 / 0,387
3	x	120RM+70RM	47,7	5822	0,153 / 0,268
3	x	150RM+70RM	51,9	6979	0,124 / 0,268
3	x	185RM+95RM	57,9	8744	0,0991 / 0,193
3	x	240RM+120RM	64,7	11176	0,0754 / 0,153
4	x	35RM+16RM	33,3	2429	0,524 / 1,15
4	x	50RM+25RM	38,6	3279	0,387 / 0,727
4	x	70RM+35RM	42,4	4349	0,268 / 0,524
4	x	95RM+50RM	49,6	5959	0,193 / 0,387
4	x	120RM+70RM	53,5	7305	0,153 / 0,268
4	x	150RM+70RM	59,0	8864	0,124 / 0,268

FLAMEX 950 NHXH FE180/E90 0,6/1 kV

DIN VDE 0266, DIN 4102-12



Halogen-free low smoke fire resistant security power cables

FIRE PERFORMANCE

Insulation integrity FE 180:	DIN VDE 0472-814 (800°C, 180 min.), IEC 60331-21
System integrity E30:	DIN 4102-12 (30 min.)
Flame propagation:	DIN EN 50266-2-2, VDE 0482-266-2-2, IEC 60332-3-22
Smoke density:	DIN EN 61034-2, VDE 0482-1034-2, IEC 61034-2
Gases evolved during combustion:	DIN EN 50267-2-2, VDE 0482-267-2-2, IEC 60754-2: pH ≥ 4,3; conductivity ≤ 2,5 µS/mm

CONSTRUCTION

Conductors:	bare copper conductor, circular solid class 1 (RE) or stranded circular or circular compacted class 2 (RM) according to EN 60228
Primary insulation:	a suitable wrapping of mica tape with a glass cloth
Insulation:	special fire resistant cross-linked compound
Inner covering:	special flame-retardant and halogen-free compound
Sheath:	thermoplastic halogen- free compound type HM4 according to HD 604 S1
Colour of sheath:	orange

CHARACTERISTIC

Core identification: according to HD 308 S2

	NHXH-O FE180/E90	**NHXH-J FE180/E90**
	without protective conductor	with protective conductor
1-core:	black	green-yellow
2-core:	blue, brown	—
3-core:	brown, black, grey	green-yellow, blue, brown
4-core:	blue, brown, black, grey	green-yellow, brown, black, grey
5-core:	blue, brown, black, grey, black	green-yellow, blue, brown, black, grey
more 5-core:	black with numbering	green-yellow, others cores black with numbering

Maximum conductor operating temperature:	+90°C
Lowest ambient temperature for fixed installation:	-30°C
Lowest installation temperature:	-5°C
Maximum short-circuit conductor temperature:	+250°C
Minimum bending radius:	15D - for single core cable; 12D - for multicore cable (D - overall cable diameter)
Maximum permissible tensile stress with cable grip for Cu-conductor:	50 N/mm²
Application:	Fire resistant security cables for installation everywhere where high safety requirements have a special significance e.g., in industrial complexes, power stations, public buildings, hotels, underground railway systems, hospitals etc.
Standard packing:	500 m on drums. Other forms of packing and delivery are available on request.

Number and cross-sectional area of conductor			Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at 20°C
n x mm²			mm	kg/km	W/km
1	x	1,5RE	8,2	86	12,1
1	x	2,5RE	8,6	101	7,41
1	x	4RE	9,0	120	4,61
1	x	6RE	9,5	144	3,08
1	x	10RE	10,3	191	1,83
1	x	16RM	11,6	263	1,15
1	x	25RM	13,4	376	0,727
1	x	35RM	14,5	478	0,524
1	x	50RM	16,4	628	0,387
1	x	70RM	17,9	842	0,268
1	x	95RM	20,7	1143	0,193
1	x	120RM	22,1	1387	0,153
1	x	150RM	24,6	1703	0,124
1	x	185RM	26,7	2089	0,0991
1	x	240RM	30,0	2685	0,0754
1	x	300RM	32,6	3318	0,0601
1	x	400RM	37,2	4279	0,0470
2	x	1,5RE	15,8	334	12,1
2	x	2,5RE	16,6	380	7,41
2	x	4RE	17,5	441	4,61
2	x	6RE	18,5	514	3,08
2	x	10RE	20,0	649	1,83
2	x	16RM	22,7	874	1,15
2	x	25RM	26,3	1226	0,727
3	x	1,5RE	16,6	369	12,1
3	x	2,5RE	17,5	425	7,41
3	x	4RE	18,4	500	4,61
3	x	6RE	19,5	592	3,08
3	x	10RE	21,2	765	1,83
3	x	16RM	24,0	1042	1,15
3	x	25RM	27,9	1479	0,727
3	x	35RM	30,2	1847	0,524
3	x	50RM	34,9	2480	0,387
3	x	70RM	38,0	3223	0,268
3	x	95RM	43,8	4346	0,193
3	x	120RM	47,2	5263	0,153
3	x	150RM	52,4	6467	0,124
3	x	185RM	57,6	7963	0,0991
3	x	240RM	64,6	10187	0,0754
4	x	1,5RE	18,0	432	12,1
4	x	2,5RE	19,0	502	7,41
4	x	4RE	20,1	597	4,61
4	x	6RE	21,2	711	3,08
4	x	10RE	23,2	929	1,83
4	x	16RM	26,3	1278	1,15
4	x	25RM	30,7	1828	0,727
4	x	35RM	33,4	2311	0,524
4	x	50RM	38,6	3103	0,387
4	x	70RM	42,1	4058	0,268
4	x	95RM	48,9	5531	0,193
4	x	120RM	52,5	6675	0,153
4	x	150RM	58,6	8236	0,124

Number and cross-sectional area of conductor			Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at 20°C
n x mm²			mm	kg/km	W/km
4	x	185RM	63,8	10071	0,0991
4	x	240RM	71,9	12936	0,0754
5	x	1,5RE	19,6	507	12,1
5	x	2,5RE	20,6	590	7,41
5	x	4RE	21,8	706	4,61
5	x	6RE	23,2	847	3,08
5	x	10RE	25,3	1115	1,83
5	x	16RM	28,9	1543	1,15
5	x	25RM	33,9	2232	0,727
5	x	35RM	37,2	2850	0,524
5	x	50RM	42,7	3795	0,387
5	x	70RM	46,8	5004	0,268
5	x	95RM	54,2	6786	0,193
5	x	120RM	58,5	8259	0,153
5	x	150RM	65,0	10139	0,124
5	x	185RM	71,1	12444	0,0991
5	x	240RM	80,1	15990	0,0754
7	x	1,5RE	21,2	598	12,1
7	x	2,5RE	22,3	704	7,41
7	x	4RM	24,7	897	4,61
8	x	1,5RE	22,8	664	12,1
10	x	1,5RE	26,6	843	12,1
10	x	1,5RM	27,4	880	12,1
10	x	2,5RE	28,1	996	7,41
12	x	1,5RE	27,4	924	12,1
12	x	2,5RE	29,0	1100	7,41
14	x	1,5RE	28,8	1024	12,1
14	x	2,5RE	30,5	1225	7,41
19	x	1,5RE	32,0	1280	12,1
19	x	2,5RE	34,3	1578	7,41
20	x	1,5RE	33,8	1391	12,1
20	x	1,5RM	34,9	1453	12,1
24	x	1,5RE	38,0	1662	12,1
24	x	2,5RE	40,5	2018	7,41
30	x	1,5RE	40,4	1952	12,1
30	x	2,5RE	42,9	2362	7,41

FLAMEX 950 (N)HXCH FE180/E90 0,6/1 kV

DIN VDE 0266, DIN 4102-12

Halogen-free low smoke fire resistant security power cables with copper concentric conductor

FIRE PERFORMANCE	
Insulation integrity FE 180:	DIN VDE 0472-814 (800°C, 180 min.), IEC 60331-21
System integrity E30:	DIN 4102-12 (90 min.)
Flame propagation:	DIN EN 50266-2-2, VDE 0482-266-2-2, IEC 60332-3-22
Smoke density:	DIN EN 61034-2, VDE 0482-1034-2, IEC 61034-2
Gases evolved during combustion:	DIN EN 50267-2-2, VDE 0482-267-2-2, IEC 60754-2: pH ≥ 4,3; conductivity ≤ 2,5 µS/mm

CONSTRUCTION	
Conductors:	bare copper conductor, circular solid class 1 (RE) or stranded circular or circular compacted class 2 (RM) according to EN 60228
Insulation:	special fire resistant cross-linked compound
Inner covering:	special flame-retardant and halogen-free compound
Concentric conductor:	inner layer - round copper wires, outer layer - copper tape
Separator:	tape
Sheath:	thermoplastic halogen- free compound type HM4 according to DIN VDE 0276-604

CHARACTERISTIC	
Colour of sheath:	orange
Core identification:	according to HD 308 S2 or EN 50334

2-core:	blue, brown
3-core:	brown, black, grey
3 core:*	blue, brown, black
4-core:	blue, brown, black, grey
5-core:	blue, brown, black, grey, black
≥ 7-core:	black with numbering

*For certain applications only.

Maximum conductor operating temperature:	+90°C
Lowest ambient temperature for fixed installation:	-30°C
Lowest installation temperature:	-5°C
Maximum short-circuit conductor temperature:	+250°C
Minimum bending radius:	15D - for single core cable; 12D - for multicore cable (D - overall cable diameter)
Maximum permissible tensile stress with cable grip for Cu-conductor:	50 N/mm², (total cross-section in mm2 of the conductors (any screen not included)
Application:	Fire resistant security cables for installation everywhere where high safety requirements have a special significance e.g., in industrial complexes, power stations, public buildings, hotels, underground railway systems, hospitals etc.
Standard packing:	500 m on drums. Other forms of packing and delivery are available on request.

Number and cross-sectional area of conductor			Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at 20°C
n x mm²			mm	kg/km	W/km
2	x	1,5 RE/1,5	15,9	324	12,1 / 12,1
2	x	2,5 RE//2,5	16,6	374	7,41 / 7,41
2	x	4 RE/4	17,9	453	4,61 / 4,61
2	x	6 RE/6	19,2	541	3,08 / 3,08
2	x	10 RE/10	20,9	708	1,83 / 1,83
2	x	16 RM/16	24,0	988	1,15 / 1,15
2	x	25 RM/16	27,5	1319	0,727 / 1,15
2	x	35 RM/16	29,6	1598	0,524 / 1,15
3	x	1,5 RE/1,5	16,6	354	12,1 / 12,1
3	x	2,5 RE/2,5	17,4	413	7,41 / 7,41
3	x	4 RE/4	18,8	505	4,61 / 4,61
3	x	6 RE/6	20,1	612	3,08 / 3,08
3	x	10 RE/10	21,9	814	1,83 / 1,83
3	x	16 RM/16	25,3	1147	1,15 / 1,15
3	x	25 RM/16	29,0	1561	0,727 / 1,15
3	x	35 RM/16	31,2	1923	0,524 / 1,15
3	x	50 RM/25	35,9	2638	0,387 / 0,727
3	x	70 RM/35	39,6	3481	0,268 / 0,524
3	x	95 RM/50	45,5	4713	0,193 / 0,387
3	x	120 RM/70	49,5	5845	0,153 / 0,268
3	x	150 RM/70	54,8	7045	0,124 / 0,268
3	x	185RM/95	59,9	8773	0,0991 / 0,193
4	x	1,5 RE/1,5	17,8	404	12,1 / 12,1
4	x	2,5 RE/2,5	18,7	476	7,41 / 7,41
4	x	4 RE/4	20,2	587	4,61 / 4,61
4	x	6 RE/6	21,6	715	3,08 / 3,08
4	x	10 RE/10	23,7	961	1,83 / 1,83
4	x	16 RM/16	27,3	1363	1,15 / 1,15
4	x	25 RM/16	31,5	1885	0,727 / 1,15
4	x	35 RM/16	33,6	2357	0,524 / 1,15
4	x	50 RM/25	39,4	3232	0,387 / 0,727
4	x	70 RM/35	43,5	4285	0,268 / 0,524
4	x	95 RM/50	50,4	5869	0,193 / 0,387
4	x	120 RM/70	54,6	7223	0,153 / 0,268
4	x	150 RM/70	60,8	8808	0,124 / 0,268
4	x	185 RM/95	66,1	10872	0,0991 / 0,193
4	x	240 RM/120	74,2	13955	0,0754 / 0,153
5	x	1,5 RE/2,5	19,1	471	12,1 / 7,41
5	x	2,5 RE/2,5	20,1	550	7,41 / 7,41
5	x	4 RE/4	21,7	680	4,61 / 4,61
5	x	6 RE/6	23,0	830	3,08 / 3,08
5	x	10 RE/10	25,6	1125	1,83 / 1,83
5	x	16 RM/16	29,6	1604	1,15 / 1,15
5	x	25 RM/16	33,9	2254	0,727 / 1,15
5	x	35 RM/16	37,3	2881	0,524 / 1,15

Number and cross-sectional area of conductor			Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at 20°C
n x mm²			mm	kg/km	W/km
5	x	50 RM/25	43,3	3890	0,387 / 0,727
5	x	70 RM/35	48,3	5240	0,268 / 0,524
5	x	95 RM/50	55,5	7104	0,193 / 0,387
7	x	1,5 RE/2,5	20,4	544	12,1 / 7,41
7	x	2,5 RE/2,5	21,6	643	7,41 / 7,41
7	x	4 RM/4	24,1	849	4,61 / 4,61
10	x	1,5 RE/2,5	25,0	740	12,1 / 7,41
10	x	2,5 RE/4	26,8	903	7,41 / 4,61
12	x	1,5 RE/2,5	25,7	803	12,1 / 7,41
12	x	2,5 RE/4	27,5	986	7,41 / 4,61
16	x	2,5 RE/6	30,6	1241	7,41 / 3,08
19	x	1,5 RE/4	30,0	1115	12,1 / 4,61
19	x	2,5 RE/6	32,4	1413	7,41 / 3,08
21	x	1,5 RE/6	31,5	1219	12,1 / 3,08
21	x	2,5 RE/10	34,1	1576	7,41 / 1,83
24	x	1,5 RE/6	35,3	1448	12,1 / 3,08
24	x	2,5 RE/10	37,8	1816	7,41 / 1,83

FLAMEX 950 NHXCH FE180/E90 0,6/1 kV

DIN VDE 0266, DIN 4102-12

Halogen-free, low smoke, fire resistant security power cables with copper concentric conductor

FIRE PERFORMANCE	
Insulation integrity FE 180:	DIN VDE 0472-814 (800oC, 180 min.), IEC 60331-21
System integrity E90:	DIN VDE 4102-12 (90 min.)
Flame propagation:	DIN VDE 0482-266-2-2, DIN EN 50266-2-2, IEC 60332-3 -22
Smoke density:	DIN VDE 0472-1034-2 , IEC 61034-2
Gases evolved during combustion:	VDE 0482-267-2-2, DIN EN 50267-2-2 , IEC 60754-2: pH ≥ 4,3; conductivity ≤ 2,5 µS/mm
CONSTRUCTION	
Conductors:	bare copper conductor, circular solid class 1 (RE) or stranded circular or circular compacted class 2 (RM) acc. to EN 60228
Primary insulation:	A suitable wrapping of mica tape with a glass cloth
Insulation:	special cross-linked compound
Inner covering:	special flame-retardant and halogen-free compound
Concentric conductor:	inner layer - round copper wires, outer layer - copper tape
Separator:	tape
Sheath:	thermoplastic halogen- free compound type HM4 acc. to DIN VDE 0276-604
CHARACTERISTIC	
Colour of sheath:	orange
Core identification:	acc. to HD 308 S2

2-core:		blue, brown
3-core:		brown, black, grey
3 core:*	*For certain applications only.	blue, brown, black
4-core:		blue, brown, black, grey
5-core:		blue, brown, black, grey, black
≥ 7-core:		black with numbering

Maximum conductor operating temperature:	+90°C
Lowest ambient temperature for fixed installation:	-30°C
Lowest installation temperature:	-5°C
Maximum short-circuit conductor temperature:	+250°C
Minimum bending radius:	15 x D - for single core cable; 12 x D - for multicore cable (D is the overall diameter of the cable)
Maximum permissible tensile stress with cable grip for Cu-conductor:	50 N/mm², calculated for the nominal sum of cross-sections of the inner conductors; the cross-section of the concentric conductors not be considered.
Application:	Fire resistant security cables for installation everywhere where high safety requirements have a special significance e.g., in industrial complexes, power stations, public buildings, hotels, underground railway systems, hospitals etc.
Standard packing:	500 m on drums. Other forms of packing and delivery are available on request.

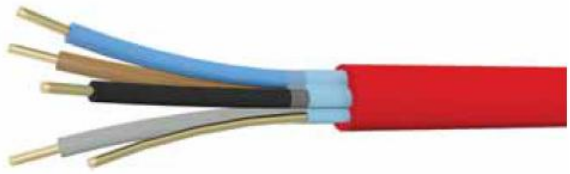
Number and cross-sectional area of conductor			Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at 20°C
n x mm²			mm	kg/km	W/km
2	x	1,5 RE/1,5	17,5	393	12,1 / 12,1
2	x	2,5 RE//2,5	18,3	447	7,41 / 7,41
2	x	4 RE/4	19,6	530	4,61 / 4,61
2	x	6 RE/6	20,9	624	3,08 / 3,08
2	x	10 RE/10	22,6	799	1,83 / 1,83
2	x	16 RM/16	25,7	1089	1,15 / 1,15
2	x	25 RM/16	29,4	1450	0,727 / 1,15
2	x	35 RM/16	31,5	1740	0,524 / 1,15
3	x	1,5 RE/1,5	18,4	430	12,1 / 12,1
3	x	2,5 RE/2,5	19,2	494	7,41 / 7,41
3	x	4 RE/4	20,6	592	4,61 / 4,61
3	x	6 RE/6	21,9	704	3,08 / 3,08
3	x	10 RE/10	23,7	916	1,83 / 1,83
3	x	16 RM/16	27,1	1260	1,15 / 1,15
3	x	25 RM/16	31,0	1708	0,727 / 1,15
3	x	35 RM/16	33,3	2082	0,524 / 1,15
3	x	50 RM/25	38,0	2827	0,387 / 0,727
3	x	70 RM/35	41,7	3686	0,268 / 0,524
3	x	95 RM/50	47,6	4958	0,193 / 0,387
3	x	120 RM/70	51,7	6114	0,153 / 0,268
3	x	150 RM/70	56,9	7344	0,124 / 0,268
3	x	185RM/95	62,0	9100	0,0991 / 0,193
4	x	1,5 RE/1,5	19,8	496	12,1 / 12,1
4	x	2,5 RE/2,5	20,7	573	7,41 / 7,41
4	x	4 RE/4	22,1	690	4,61 / 4,61
4	x	6 RE/6	23,4	824	3,08 / 3,08
4	x	10 RE/10	25,7	1084	1,83 / 1,83
4	x	16 RM/16	29,4	1501	1,15 / 1,15
4	x	25 RM/16	34,0	2079	0,727 / 1,15
4	x	35 RM/16	35,9	2549	0,524 / 1,15
4	x	50 RM/25	41,7	3463	0,387 / 0,727
4	x	70 RM/35	45,7	4535	0,268 / 0,524
4	x	95 RM/50	52,8	6170	0,193 / 0,387
4	x	120 RM/70	57,0	7552	0,153 / 0,268
4	x	150 RM/70	63,2	9175	0,124 / 0,268
4	x	185 RM/95	68,5	11270	0,0991 / 0,193
4	x	240 RM/120	76,6	14410	0,0754 / 0,153
5	x	1,5 RE/2,5	21,3	580	12,1 / 7,41
5	x	2,5 RE/2,5	22,4	665	7,41 / 7,41
5	x	4 RE/4	23,9	804	4,61 / 4,61
5	x	6 RE/6	25,3	963	3,08 / 3,08
5	x	10 RE/10	27,8	1274	1,83 / 1,83
5	x	16 RM/16	31,9	1771	1,15 / 1,15
5	x	25 RM/16	36,4	2472	0,727 / 1,15
5	x	35 RM/16	39,9	3119	0,524 / 1,15

Number and cross-sectional area of conductor			Approximate overall diameter	Approximate net weight of cables	Maximum conductor resistance at 20°C
n x mm²			mm	kg/km	W/km
5	x	50 RM/25	45,8	4169	0,387 / 0,727
5	x	70 RM/35	50,8	5548	0,268 / 0,524
5	x	95 RM/50	58,2	7471	0,193 / 0,387
7	x	1,5 RE/2,5	22,9	674	12,1 / 7,41
7	x	2,5 RE/2,5	24,1	783	7,41 / 7,41
7	x	4 RM/4	26,7	998	4,61 / 4,61
10	x	1,5 RE/2,5	28,3	929	12,1 / 7,41
10	x	2,5 RE/4	30,1	1106	7,41 / 4,61
12	x	1,5 RE/2,5	29,2	1012	12,1 / 7,41
12	x	2,5 RE/4	31,0	1212	7,41 / 4,61
16	x	2,5 RE/6	34,5	1528	7,41 / 3,08
19	x	1,5 RE/4	34,2	1415	12,1 / 4,61
19	x	2,5 RE/6	36,6	1741	7,41 / 3,08
21	x	1,5 RE/6	36,0	1545	12,1 / 3,08
21	x	2,5 RE/10	38,6	1935	7,41 / 1,83
24	x	1,5 RE/6	40,3	1836	12,1 / 3,08
24	x	2,5 RE/10	42,8	2235	7,41 / 1,83

FLAME-X 950 HDGs, HLGs, HLgGs, HDGsekwf, HLGsekwf, HLgGsekwf 300/500V

ZN-TF-208, BS 6387

Halogen-free low smoke fire resistant cables



FIRE PERFORMANCE	
Fire resistance:	IEC 60331: 3h at 750°C EN 50200 – PH 90 (for cables with overall diameter ≤ 20 mm) BS 6387 Category C – resistance to fire: 3 h at 950°C Category W – resistance to fire with water: 15 min at 650°C plus 15 min with water spray Category Z – resistance to fire with mechanical shock: 15 min at 950°C
Flame propagation:	IEC 60332-3-22 Category A, (EN 50266-2-2)
Smoke emission:	IEC 61034-2, BS EN 61034-2:
Gases evolved during combustion:	IEC 60754-1, EN 50267-2-1: < 0,5% acid gas IEC 60754-2, EN 50267-2-2: pH ≥ 4,3; conductivity ≤ 10 $\mu S mm^{-1}$

TYPE OF FLAME-X 950 CABLES:	
HDGs	cable with solid copper conductors (D), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free owwuter sheath (H)
HLGs	cable with stranded copper conductors (L), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H)
HLgGs	cable with stranded flexible copper conductors (Lg), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H)
HDGsekwf	cable with solid copper conductors (D), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H), with electrostatic screen of aluminium/polyester laminated tape (ekwf)
HLGsekwf	cable with stranded copper conductors (L), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H), with electrostatic screen of aluminium/polyester laminated tape (ekwf)
HLgGsekwf	cable with stranded flexible copper conductors (Lg), special cross-linked silicone compound insulation (Gs) and thermoplastic halogen-free outer sheath (H), with electrostatic screen of aluminium/polyester laminated tape (ekwf)

CONSTRUCTION	
Conductors:	circular copper class 1 (D), circular stranded copper class 2 (L) or circular flexible stranded copper class 5 (Lg) according to EN 60228
Drain wire:	tinned annealed copper wires class 1 or stranded class 2 according to EN 60228
Insulation:	special cross-linked heat resistant compound type EI2 FR (Gs) according to EN 50363.1
Optional binder:	non hygroscopic halogen free tape
Screen:	aluminium/polyester laminated tape and drain wire (ekwf)
Outer sheath:	thermoplastic zero halogen low smoke compound (H) according to ZN-TF-208

CHARACTERISTIC	
Colour of sheath:	red
Core identification:	≤ 5 core: according to HD 308 S2

CHARACTERISTIC

	without protective conductor	with protective conductor
≥ 7 core:	in each layer: brown (starting core), blue (reference core), other cores natural	in outer layer: green-yellow, blue (reference core), others cores shall be natural, in other layers: brown (starting core), blue (reference core), other cores natural

Maximum conductor operating temperature:	+90°C
Lowest temperature ambient for fixed installation:	-25°C
Lowest installation temperature:	-10°C
Maximum short-circuit conductor temperature:	+250°C
Minimum bending radius:	6 D (D is the overall diameter of the cable)
Application:	Installations emergency lighting and evacuation systems, fire and smoke detection systems air-conditioning and alarm systems, automatic elevator doors, computer control rooms, offshore and marine emergency systems, emergency evacuation communicators.
Standard packing:	500 m on drums. Other forms of packing and delivery are available on request.

Number and cross-sectional area of conductor			Approximate overall diameter			Approximate net weight of cables		
			HDGs	HLGs	HLgGs	HDGs	HLGs	HLgGs
n x mm²			mm			kg/km		
2	x	1	6,4	6,9	6,8	50	54	52
2	x	1,5	7,5	8,1	8,0	69	75	72
2	x	2,5	8,9	9,6	9,6	100	109	105
2	x	4	9,8	10,6	10,5	133	144	137
3	x	1	6,8	7,3	7,2	64	70	67
3	x	1,5	7,9	8,6	8,5	90	98	93
3	x	2,5	9,4	10,1	10,1	132	143	137
3	x	4	10,6	11,5	11,3	185	200	189
4	x	1	7,6	8,2	8,0	83	91	86
4	x	1,5	8,9	9,6	9,4	117	127	120
4	x	2,5	10,5	11,3	11,3	171	186	178
4	x	4	11,6	12,6	12,4	235	254	239
5	x	1	8,6	9,3	9,1	109	119	113
5	x	1,5	9,8	10,6	10,4	147	160	152
5	x	2,5	11,6	12,5	12,5	216	235	225
5	x	4	12,8	13,9	13,7	297	321	303
7	x	1	9,3	10,1	9,8	135	148	140
7	x	1,5	10,8	11,7	11,5	190	206	195
7	x	2,5	12,6	13,6	13,6	274	298	284
10	x	1	11,8	12,8	12,5	192	211	199
10	x	1,5	13,6	14,8	14,5	263	287	270
10	x	2,5	16,5	17,9	17,9	407	441	421
12	x	1	12,1	13,2	12,9	220	241	228
12	x	1,5	14,0	15,3	15,0	303	331	311
12	x	2,5	17,0	18,5	18,4	470	510	486
16	x	1	13,4	14,6	14,2	282	310	292
16	x	1,5	16,1	17,5	17,2	415	453	427

Number and cross-sectional area of conductor			Approximate overall diameter			Approximate net weight of cables		
			HDGs	HLGs	HLgGs	HDGs	HLGs	HLgGs
n x mm²			mm			kg/km		
16	x	2,5	19,4	21,1	21,0	635	690	659
20	x	1	15,4	16,8	16,3	361	395	373
20	x	1,5	18,4	20,0	19,6	524	571	539
20	x	2,5	21,4	23,3	23,2	765	830	791
24	x	1	17,0	18,6	18,1	424	466	439
24	x	1,5	20,3	22,1	21,7	618	673	634
24	x	2,5	24,4	26,5	26,4	939	1019	972
30	x	1	18,6	20,2	19,7	535	587	553
30	x	1,5	21,4	23,4	23,0	742	808	760
30	x	2,5	25,8	28,0	27,9	1132	1228	1168
37	x	1	19,9	21,7	21,2	638	699	659
37	x	1,5	23,7	25,8	25,3	922	1004	945
37	x	2,5	27,7	30,2	30,1	1360	1476	1402

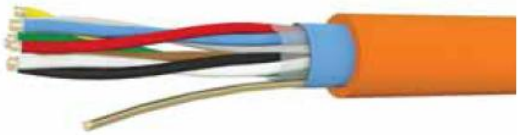
Number and cross-sectional area of conductor			Approximate overall diameter			Approximate net weight of cables		
			HDGsekwf	HLGsekwf	HLgGsekwf	HDGsekwf	HLGsekwf	HLgGsekwf
n x mm²			mm			kg/km		
2	x	1	7,1	7,4	7,3	65	68	65
2	x	1,5	8,2	8,6	8,5	90	94	89
2	x	2,5	9,6	10,1	10,1	130	137	131
2	x	4	10,5	11,1	11,0	177	186	176
3	x	1	7,5	7,9	7,7	81	85	81
3	x	1,5	8,7	9,1	9,0	113	118	112
3	x	2,5	10,1	10,7	10,7	165	174	166
3	x	4	11,3	12,0	11,9	232	244	230
4	x	1	8,5	9,0	8,7	103	109	103
4	x	1,5	9,9	10,6	10,4	143	152	143
4	x	2,5	11,9	12,8	12,8	211	224	214
4	x	4	13,6	14,8	14,6	291	310	291
5	x	1	10,4	10,8	10,6	132	139	129
5	x	1,5	11,6	12,1	12,0	171	181	169
5	x	2,5	13,4	14,0	14,0	244	258	245
5	x	4	14,6	15,4	15,3	326	346	323
7	x	1	11,2	11,7	11,4	161	169	158
7	x	1,5	12,7	13,3	13,1	219	230	215
7	x	2,5	14,5	15,2	15,2	306	324	306
10	x	1	14,0	14,6	14,3	226	238	222
10	x	1,5	15,8	16,6	16,3	300	316	296
10	x	2,5	18,7	19,7	19,7	450	476	453
12	x	1	14,4	15,0	14,7	257	271	253
12	x	1,5	16,3	17,1	16,8	344	363	340
12	x	2,5	19,3	20,3	20,3	518	548	521

Number and cross-sectional area of conductor			Approximate overall diameter			Approximate net weight of cables		
			HDGsekwf	HLGsekwf	HLgGsekwf	HDGsekwf	HLGsekwf	HLgGsekwf
n x mm²			mm			kg/km		
16	x	1	15,8	16,6	16,2	327	346	324
16	x	1,5	18,5	19,5	19,2	468	495	465
16	x	2,5	21,8	23,0	23,0	698	740	705
20	x	1	18,0	18,8	18,4	416	439	412
20	x	1,5	21,0	22,0	21,7	589	622	585
20	x	2,5	24,0	25,4	25,3	838	887	844
24	x	1	19,8	20,8	20,3	488	515	483
24	x	1,5	23,1	24,3	23,9	692	730	687
24	x	2,5	27,2	28,7	28,6	1027	1087	1036
30	x	1	21,5	22,5	22,0	612	646	608
30	x	1,5	24,4	25,6	25,3	828	874	822
30	x	2,5	28,7	30,3	30,2	1233	1306	1243
37	x	1	23,0	24,1	23,6	727	768	722
37	x	1,5	26,8	28,2	27,7	1027	1084	1021
37	x	2,5	30,8	32,6	32,5	1479	1566	1489

FLAMEBLOCKER JE-H(St)H ... Bd

Based on DIN VDE 0815

Halogen-free low smoke installation cables for telecommunication and data processing systems



FIRE PERFORMANCE

Flame propagation:	VDE 0482-266-2-4, DIN EN 50266-2-4 (IEC 60332-3-24 Category C)
Smoke density:	VDE 0482-1034-2, DIN EN 61034-2 (IEC 61034-2)
Gases evolved during combustion:	VDE 0482-267-2-2, DIN EN 50267-2-2 (IEC 60754-2: pH ≥ 3,5; conductivity ≤ 100 µS cm^{-1})

CONSTRUCTION

Conductors:	bare solid copper conductor 0,6 and 0,8 mm
Insulation:	special halogen-free compound according to DIN EN 50290-2-26 (DIN VDE 0207-23)
Unit:	core twisted to pairs, 4 pairs consist to unit, units stranded to layers
Separator:	polyester tape
Screen:	aluminium/polyester laminated tape and solid copper drain wire
Drain wire:	solid tinned annealed copper wire 0,6 or 0,8 mm
Sheath:	thermoplastic halogen-free, flame retardant compound according to DIN EN 50290-27 (DIN VDE 0207-24)

CHARACTERISTIC

Colour of sheath:		grey, orange or red	
Identification of pairs:	Pair no.	a-wire	b-wire
	Loop 1	blue	red
	Loop 2	grey	yellow
	Loop 3	green	brown
	Loop 4	white	black
Binding tapes:		binding tapes with numerical marking of unit	
Identification two-pair cable:		two-pair cables shall be cabled in quad formation and colour coded: blue, yellow, red, grey	
	Pair no.	a-wire	b-wire
	Loop 1	blue	red
	Loop 2	grey	yellow
Loop resistance:		maximum 130 Ω/km at 0,6 mm 73,2 Ω/km at 0,8 mm	
Mutual capacitance:		max. 120 nF/km at 800 Hz (this values may be extended at 20% with a make-up up to 4 pairs)	
Capacitance unbalance:		max. 200 pF/100 m at 800 Hz (20% of the values, but one value up to 400 pF is allowed)	
Mutual capacitance:		max. 120 nF/km at 800 Hz	
Capacitance unbalance:		max. 200 pF/100 m at 800 Hz	

ISO ISO RoHS compliant 2002/95/EC CE 2006/95/EC VDE

FLAMEBLOCKER JE-H(St)H ... Bd

Based on DIN VDE 0815

Operating voltage (peak voltage)		225V (not for purposes of high current and power installations)
Temperature range:		
flexing::	- 5°C to + 50°C	
fixed installation	- 30°C to + 70°C	
Minimum bending radius:		6D (D - overall cable diameter)
Application:		for signal transmission. The cables are preferably used for indoor telecommunication installation in dry and damp places, but also in the open for fixed installation on outer walls of buildings.
Standard packing:		500 m on drums. Other forms of packing and delivery are available on request.

Number pairs and diameter of conductor	Approximate overall diameter	Approximate net weight of cable	Number pairs and diameter of conductor	Approximate overall diameter	Approximate net weight of cable
n x 2 x mm	**mm**	**kg/km**	**n x 2 x mm**	**mm**	**kg/km**
2 x 2 x 0,6	5,5	44	2 x 2 x 0,8	6,5	62
4 x 2 x 0,6	6,6	65	4 x 2 x 0,8	8,1	95
8 x 2 x 0,6	8,3	101	8 x 2 x 0,8	10,4	156
12 x 2 x 0,6	9,6	135	12 x 2 x 0,8	12,2	214
16 x 2 x 0,6	10,5	167	16 x 2 x 0,8	13,9	283
20 x 2 x 0,6	11,5	199	20 x 2 x 0,8	15,2	340
24 x 2 x 0,6	12,3	231	24 x 2 x 0,8	16,3	396
28 x 2 x 0,6	13,2	273	28 x 2 x 0,8	17,0	448
32 x 2 x 0,6	13,9	304	32 x 2 x 0,8	18,4	521
36 x 2 x 0,6	14,6	335	36 x 2 x 0,8	19,3	576
40 x 2 x 0,6	15,2	366	40 x 2 x 0,8	20,1	630
44 x 2 x 0,6	15,8	396	44 x 2 x 0,8	20,9	684
48 x 2 x 0,6	16,4	426	48 x 2 x 0,8	21,7	737
52 x 2 x 0,6	16,9	256	52 x 2 x 0,8	22,5	791
56 x 2 x 0,6	17,4	486	56 x 2 x 0,8	23,2	844
60 x 2 x 0,6	17,9	517	60 x 2 x 0,8	24,3	924
64 x 2 x 0,6	18,8	566	64 x 2 x 0,8	25,0	978
68 x 2 x 0,6	19,3	595	68 x 2 x 0,8	25,6	1032
72 x 2 x 0,6	19,8	626	72 x 2 x 0,8	26,2	1085
76 x 2 x 0,6	20,2	655	76 x 2 x 0,8	26,9	1138
80 x 2 x 0,6	20,6	685	80 x 2 x 0,8	27,5	1191

HTKSH
HTKSHekw

Kable instalacyjne bezhalogenowe dla urządzeń teletechnicznych oraz przetwarzania danych

NORMA:

W oparciu o PN-92/T-90320 i PN-92/T-90321
Dyrektywa RoHS 2002/95/WE, Dyrektywa niskonapięciowa 2006/95/WE

CHARAKTERYSTYKA:

Żyły:
miękkie druty miedziane o średnicy 0,4; 0,5; 0,6; 0,8; 1,0; 1,4 mm
Izolacja:
specjalne termoplastyczne tworzywo bezhalogenowe wg EN 50290-2-26
Pary:
żyły skręcone w pary, pary skręcone w ośrodek
Separator:
folia poliestrowa
Ekran:
folia aluminiowo-poliestrowa z żyłą uziemiającą (tylko HTKSHekw)
Żyła uziemiająca:
drut miedziany ocynowany o średnicy 0,4 mm (tylko HTKSHekw)
Powłoka:
specjalne termoplastyczne tworzywo bezhalogenowe nierozprzestrzeniające płomienia wg EN 50290-2-27
Kolor powłoki:
szary (lub inny zgodnie z życzeniem klienta)
Identyfikacja par: wg PN-92/T-90321

Własności elektryczne
Rezystancja pętli pary: max 306,0 Ω/km dla 0,4 mm
195,6 Ω/km dla 0,5 mm
135,8 Ω/km dla 0,6 mm
75 Ω/km dla 0,8 mm
25 Ω/km dla 1,0 mm
13 Ω/km dla 1,4 mm

Rezystancja izolacji w temperaturze 20°C: min.200 MΩ x km
Pojemność robocza: max 120 nF/km
Asymetria pojemności: max 400 pF/500 m
Rezystancja izolacji w temperaturze 20°C: min.200 MΩ x km
Pojemność robocza: max 120 nF/km
Asymetria pojemności: max 400 pF/500 m
Napięcie pracy: 300V

Temperatura pracy:
dla stanu spoczynku:: - 5°C do + 50°C
dla stanu ruchu: - 30°C do + 70°C
Minimalny promień gięcia: 10 x D (D – średnica zewnętrzna kabla)

Rozprzestrzenianie płomienia: EN 60332-1-2
Emisja dymów: EN 61034-2 (IEC 61034-2)
Korozyjność gazów: EN 50267-2-2(IEC 60754-2: pH ≥ 3,5; przewodność ≤ 100 $\mu S \cdot cm^{-1}$

Zastosowanie: Kable bezhalogenowe o polepszonym zachowaniu się w przypadku pożaru, o niskiej emisji dymów i gazów korozyjnych. Kable przeznaczone do połączeń urządzeń telefonicznych, teletransmisyjnych i przetwarzania danych w instalacjach elektroniki przemysłowej. Kable przeznaczone są do instalacji na stałe wewnątrz budynków. Kable nie są dopuszczone do instalacji elektroenergetycznych oraz do układania w ziemi.

Standardowe Opakowanie: w krążkach 500 m. Istnieje możliwość oferowania innych długości odcinków i rodzajów opakowań.

HTKSH
HTKSHekw

HTKSH					
Liczba par i średnica żyły	Przybliżona średnica kabla	Przybliżona waga kabla	Liczba par i średnica żyły	Przybliżona średnica kabla	Przybliżona waga kabla
n x 2 x mm	mm	kg/km	n x 2 x mm	mm	kg/km
1 x 2 x 0,4	3,3	13	1 x 2 x 0,5	3,6	16
2 x 2 x 0,4	4,0	19	2 x 2 x 0,5	4,3	24
3 x 2 x 0,4	4,5	25	3 x 2 x 0,5	4,8	31
5 x 2 x 0,4	5,3	34	5 x 2 x 0,5	5,6	44
6 x 2 x 0,4	5,7	41	6 x 2 x 0,5	6,5	54
7 x 2 x 0,4	6,0	45	7 x 2 x 0,5	6,8	61
10 x 2 x 0,4	6,8	58	10 x 2 x 0,5	7,8	79
12 x 2 x 0,4	7,2	67	12 x 2 x 0,5	8,4	91
14 x 2 x 0,4	7,7	75	14 x 2 x 0,5	8,9	103
20 x 2 x 0,4	9,0	103	20 x 2 x 0,5	9,9	140
21 x 2 x 0,4	9,0	107	21 x 2 x 0,5	10,4	148
28 x 2 x 0,4	9,8	123	28 x 2 x 0,5	11,6	177
30 x 2 x 0,4	10,5	142	30 x 2 x 0,5	12,5	206
35 x 2 x 0,4	11,3	167	35 x 2 x 0,5	13,3	234
42 x 2 x 0,4	12,2	193	42 x 2 x 0,5	14,3	274
48 x 2 x 0,4	12,9	216	48 x 2 x 0,5	15,1	307
53 x 2 x 0,4	13,4	235	53 x 2 x 0,5	15,8	334
1 x 2 x 0,6	4,0	20	1 x 2 x 0,8	4,5	26
2 x 2 x 0,6	4,8	31	2 x 2 x 0,8	5,8	43
3 x 2 x 0,6	5,5	40	3 x 2 x 0,8	6,9	62
5 x 2 x 0,6	6,6	59	5 x 2 x 0,8	8,2	91
6 x 2 x 0,6	7,6	73	6 x 2 x 0,8	8,9	109
7 x 2 x 0,6	8,0	82	7 x 2 x 0,8	9,4	123
10 x 2 x 0,6	9,3	108	10 x 2 x 0,8	11,0	170
12 x 2 x 0,6	9,9	125	12 x 2 x 0,8	11,9	197
14 x 2 x 0,6	10,6	142	14 x 2 x 0,8	12,6	224
20 x 2 x 0,6	12,0	195	20 x 2 x 0,8	14,6	304
21 x 2 x 0,6	12,5	204	21 x 2 x 0,8	14,8	317
28 x 2 x 0,6	14,3	268	28 x 2 x 0,8	16,3	378
30 x 2 x 0,6	14,7	284	30 x 2 x 0,8	17,6	443
35 x 2 x 0,6	15,7	324	35 x 2 x 0,8	18,8	508
42 x 2 x 0,6	17,0	380	42 x 2 x 0,8	20,6	614
48 x 2 x 0,6	18,0	428	48 x 2 x 0,8	21,9	691
53 x 2 x 0,6	18,7	467	53 x 2 x 0,8	22,8	756
1 x 2 x 1,0	5,4	40	1 x 2 x 1,4	8,6	84
2 x 2 x 1,0	6,7	64	2 x 2 x 1,4	12,0	147

HTKSH
HTKSHekw

HTKSHekw					
Liczba par i średnica żyły	Przybliżona średnica kabla	Przybliżona waga kabla	Liczba par i średnica żyły	Przybliżona średnica kabla	Przybliżona waga kabla
n x 2 x mm	mm	kg/km	n x 2 x mm	mm	kg/km
1 x 2 x 0,4	3,3	15	1 x 2 x 0,5	3,6	18
2 x 2 x 0,4	4,0	21	2 x 2 x 0,5	4,3	26
3 x 2 x 0,4	4,5	27	3 x 2 x 0,5	4,8	33
5 x 2 x 0,4	5,3	36	5 x 2 x 0,5	5,6	46
6 x 2 x 0,4	5,7	43	6 x 2 x 0,5	6,5	56
7 x 2 x 0,4	6,0	48	7 x 2 x 0,5	6,8	63
10 x 2 x 0,4	6,8	61	10 x 2 x 0,5	7,8	82
12 x 2 x 0,4	7,2	69	12 x 2 x 0,5	8,4	94
14 x 2 x 0,4	7,7	77	14 x 2 x 0,5	8,9	106
20 x 2 x 0,4	9,0	106	20 x 2 x 0,5	9,9	143
21 x 2 x 0,4	9,0	109	21 x 2 x 0,5	10,5	151
28 x 2 x 0,4	9,8	126	28 x 2 x 0,5	12,1	198
30 x 2 x 0,4	10,5	145	30 x 2 x 0,5	12,5	209
35 x 2 x 0,4	11,3	170	35 x 2 x 0,5	13,3	237
42 x 2 x 0,4	12,2	196	42 x 2 x 0,5	14,3	277
48 x 2 x 0,4	12,9	219	48 x 2 x 0,5	15,1	311
53 x 2 x 0,4	13,4	239	53 x 2 x 0,5	15,8	338
1 x 2 x 0,6	4,0	22	1 x 2 x 0,8	4,5	28
2 x 2 x 0,6	4,8	33	2 x 2 x 0,8	5,8	45
3 x 2 x 0,6	5,5	43	3 x 2 x 0,8	6,9	65
5 x 2 x 0,6	6,6	62	5 x 2 x 0,8	8,2	94
6 x 2 x 0,6	7,6	76	6 x 2 x 0,8	8,9	116
7 x 2 x 0,6	8,0	85	7 x 2 x 0,8	9,4	126
10 x 2 x 0,6	9,3	112	10 x 2 x 0,8	11,0	173
12 x 2 x 0,6	9,9	129	12 x 2 x 0,8	11,9	201
14 x 2 x 0,6	10,6	146	14 x 2 x 0,8	12,6	228
20 x 2 x 0,6	12,0	200	20 x 2 x 0,8	14,6	308
21 x 2 x 0,6	12,5	209	21 x 2 x 0,8	14,8	320
28 x 2 x 0,6	14,3	273	28 x 2 x 0,8	16,3	382
30 x 2 x 0,6	14,7	290	30 x 2 x 0,8	17,6	447
35 x 2 x 0,6	15,7	330	35 x 2 x 0,8	18,8	512
42 x 2 x 0,6	17,0	386	42 x 2 x 0,8	20,6	619
48 x 2 x 0,6	18,0	434	48 x 2 x 0,8	21,9	696
53 x 2 x 0,6	18,7	473	53 x 2 x 0,8	22,8	762
1 x 2 x 1,0	5,4	47	1 x 2 x 1,4	8,6	90
2 x 2 x 1,0	6,7	72	2 x 2 x 1,4	12,0	154

No.	No. FIRES	Cable symbol	Position	Construction
1	43	NHXH 1x240	1	horizontal supports (type CWOP40H40 L), threaded rods (type PGM10), trays (type KCOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm), ladders (type DGOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
2		NHXH 1x240		
3		NHXH 1x240		
4	42	NHXH 1x50		
5		NHXH 1x50		
6		NHXH 1x50		
113	41	NHXH 5X50		
7	32	NHXH 1x240	2	horizontal supports (type CWOP40H40 L), threaded rods (type PGM10), trays (type KCOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm), ladders (type DGOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
8		NHXH 1x240		
9		NHXH 1x240		
10	31	NHXH 1x50		
11		NHXH 1x50		
12		NHXH 1x50		
114	30	NHXH 5X50		
13	40	(N)HXCH 4x50/25	3	horizontal supports (type CWOP40H40 L), threaded rods (type PGM10), trays (type KCOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm), ladders (type DGOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
14	39	(N)HXCH 4x50/25		
15	38	NHXCH 4x1,5/1,5		
16	37	NHXCH 4x1,5/1,5		
17	75	JE-H(st)H 1x2x0,8		
18		JE-H(st)H 1x2x0,8		
19	74	HTKSHekw 2x2x0,8		
20		HTKSHekw 2x2x0,8		
21	29	NHXH-J 4x50	4	horizontal supports (type CWOP40H40 L), threaded rods (type PGM10), trays (type KCOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm), ladders (type DGOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
22	28	NHXH-J 4x50		
23	27	(N)HXH-J 4x1,5		
24	26	(N)HXH-J 4x1,5		
25	68	HDGs 2x1		
26		HDGs 2x1		
27	36	(N)HXCH 4x50/25	5	horizontal supports (type CWOP40H40 L), threaded rods (type PGM10), trays (type KCOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm), ladders (type DGOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
28	35	(N)HXCH 4x50/25		
29	34	NHXCH 4x1,5/1,5		
30	33	NHXCH 4x1,5/1,5		
31	73	JE-H(st)H 1x2x0,8		
32		JE-H(st)H 1x2x0,8		
33	72	HTKSHekw 2x2x0,8		
34		HTKSHekw 2x2x0,8		
35	25	NHXH-J 4x50	6	horizontal supports (type CWOP40H40 L), threaded rods (type PGM10), trays (type KCOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm), ladders (type DGOP 600H60/3N-L with polyurethane coat, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
36	24	NHXH-J 4x50		
37	23	(N)HXH-J 4x1,5		
38	22	(N)HXH-J 4x1,5		
39	67	HDGs 2x1		
40		HDGs 2x1		

No.	No. FIRES	Cable symbol	Position	Construction
41	13	NHXCH 4x50/25	7	consoles (type WPCOE700), booms (type WWCTO 400), ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
42	12	NHXCH 4x50/25		
43	11	(N)HXH 4x1,5/1,5		
44	10	(N)HXH 4x1,5/1,5		
45	63	JE-H(st)H 1x2x0,8		
46		JE-H(st)H 1x2x0,8		
47	62	HTKSH 2x2x0,8		
48		HTKSH 2x2x0,8		
49	4	(N)HXH-J 4x50	8	consoles (type WPCOE700), booms (type WWCTO 400), ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
50		(N)HXH-J 4x50		
51	3	(N)HXH-J 4x1,5		
52		(N)HXH-J 4x1,5		
53	59	HDGs 2x1		
54		HDGs 2x1		
55	9	NHXCH 4x50/25	9	consoles (type WPCOE700), booms (type WWCTO 400), ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
56	8	NHXCH 4x50/25		
57	7	(N)HXCH 4x1,5/1,5		
58		(N)HXCH 4x1,5/1,5		
59	61	JE-H(st)H 1x2x0,8		
60		JE-H(st)H 1x2x0,8		
61	60	HTKSH 2x2x0,8		
62		HTKSH 2x2x0,8		
63	2	NHXH-J 4x50	10	consoles (type WPCOE700), booms (type WWCTO 400), ladders (type DGOP 400H60/3N, steel sheet thickness 1,5 mm, pacing of transoms 150 mm), trays (type KCOP 400H60/3N, steel sheet thickness 1,5 mm), trays were loaded with 10 kg.m^{-1} and ladders were loaded with 20 kg.m^{-1}
64		NHXH-J 4x50		
65	1	(N)HXH-J 4x1,5		
66		(N)HXH-J 4x1,5		
67	58	HDGs 2x1		
68		HDGs 2x1		
69	51	(N)HXCH 4x50/25	11	Ceiling holders (type UDF) were fixed to ceiling by dowels (type SRO M6x30) in spacing of 600 mm.
70	50	(N)HXCH 4x50/25		
71	49	NHXH-J 4x50		
72	48	NHXH-J 4x50		
73	47	NHXCH 4x1,5/1,5		
74	46	NHXCH 4x1,5/1,5		
75	45	(N)HXH-J 4x1,5		
76	44	(N)HXH-J 4x1,5		
77	71	JE-H(st)H 1x2x0,8		
78		JE-H(st)H 1x2x0,8		
79	70	HTKSH 2x2x0,8		
80		HTKSH 2x2x0,8		
81	69	HDGs 2x1		
82		HDGs 2x1		

No.	No. FIRES	Cable symbol	Position	Construction
83	21	(N)HXCH 4x50/25	12	Ceiling holders (type KSA) were fixed to ceiling by dowels (type SRBO M6x30) in spacing of 600 mm.
84	20	(N)HXCH 4x50/25		
85	19	NHXH-J 4x50		
86	18	NHXH-J 4x50		
87	17	NHXCH 4x1,5/1,5		
88	16	NHXCH 4x1,5/1,5		
89	15	(N)HXH-J 4x1,5		
90	14	(N)HXH-J 4x1,5		
91	66	JE-H(st)H 1x2x0,8		
92		JE-H(st)H 1x2x0,8		
93	65	HTKSH 2x2x0,8		
94		HTKSH 2x2x0,8		
95	64	HDGs 2x1		
96		HDGs 2x1		
97	6	NHXCH 4x50/25	13	Ceiling holders (type OZO) were fixed to ceiling by dowels (type SRO M6x30) in spacing of 600 mm.
98		NHXCH 4x50/25		
99	5	(N)HXCH 4x1,5/1,5		
100		(N)HXCH 4x1,5/1,5		
101	57	JE-H(st)H 1x2x0,8	14	Ceiling holders (type OZMO) were fixed to ceiling by threaded rods (type PG M6) and by dowels (type TRSO M6x30) in spacing of 600 mm.
102		JE-H(st)H 1x2x0,8		
103	56	HTKSH 2x2x0,8		
104		HTKSH 2x2x0,8		
105	55	HDGs 2x1		
106		HDGs 2x1		
107	54	JE-H(st)H 1x2x0,8	15	Holders (type UDF) were fixed to wall of the furnace by steel screws (type SBO 5x50).
108		JE-H(st)H 1x2x0,8		
109	53	HTKSH 2x2x0,8		
110		HTKSH 2x2x0,8		
111	52	HDGs 2x1		
112		HDGs 2x1		

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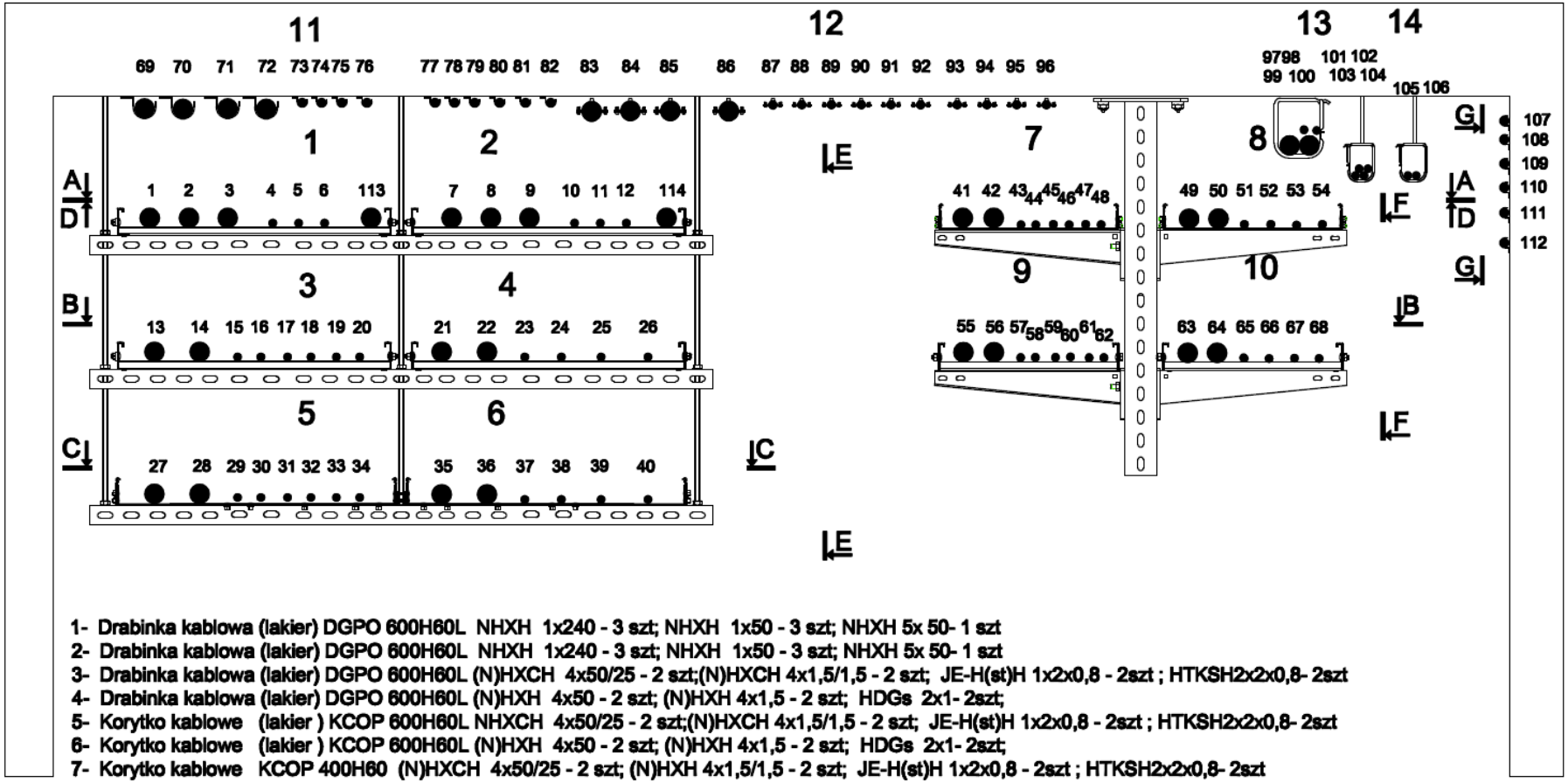
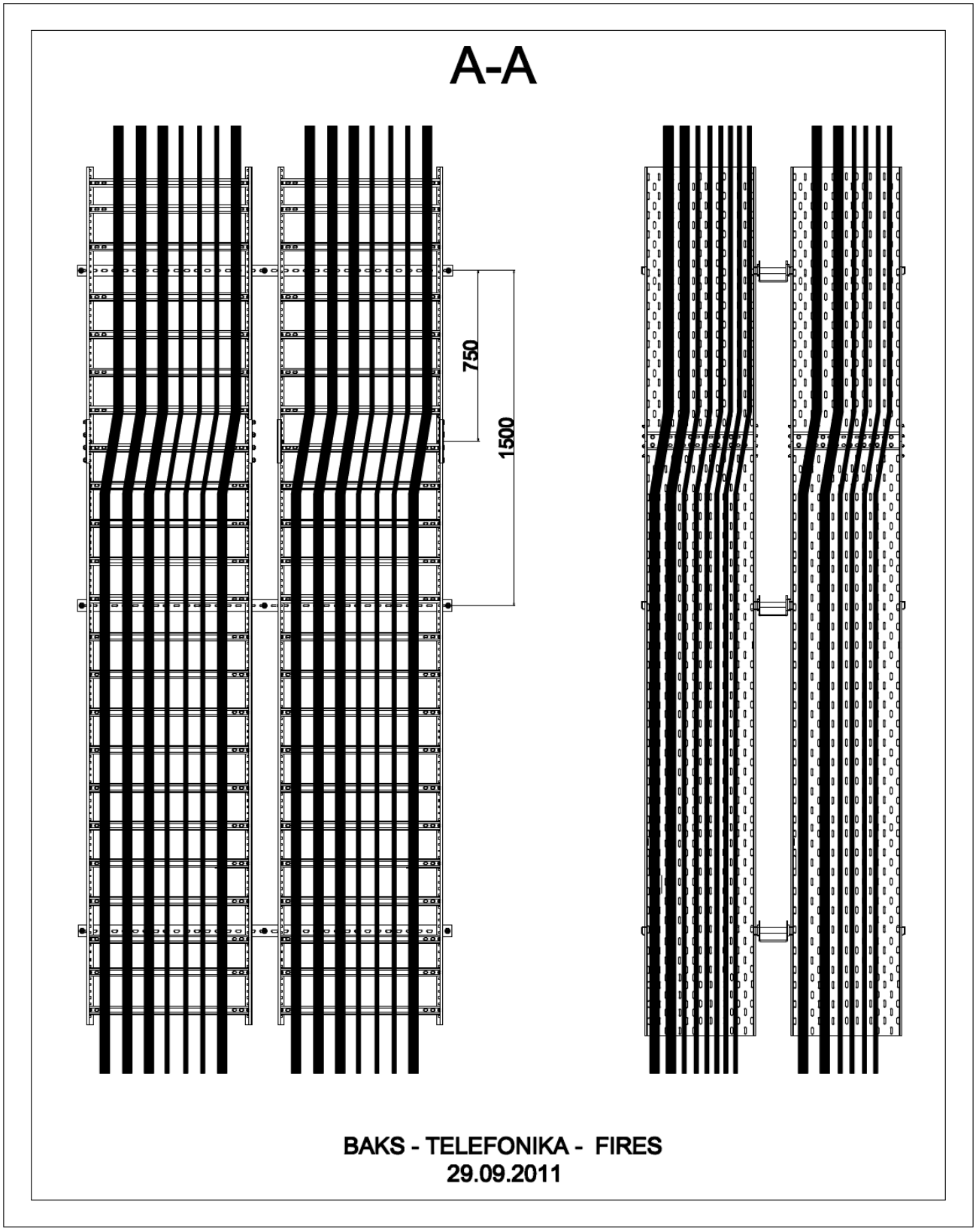


1- Drabinka kablowa (lakier) DGPO 600H60L NHXH 1x240 - 3 szt; NHXH 1x50 - 3 szt; NHXH 5x 50- 1 szt
2- Drabinka kablowa (lakier) DGPO 600H60L NHXH 1x240 - 3 szt; NHXH 1x50 - 3 szt; NHXH 5x 50- 1 szt
3- Drabinka kablowa (lakier) DGPO 600H60L (N)HXCH 4x50/25 - 2 szt;(N)HXCH 4x1,5/1,5 - 2 szt; JE-H(st)H 1x2x0,8 - 2szt ; HTKSH2x2x0,8- 2szt
4- Drabinka kablowa (lakier) DGPO 600H60L (N)HXH 4x50 - 2 szt; (N)HXH 4x1,5 - 2 szt; HDGs 2x1- 2szt;
5- Korytko kablowe (lakier) KCOP 600H60L NHXCH 4x50/25 - 2 szt;(N)HXCH 4x1,5/1,5 - 2 szt; JE-H(st)H 1x2x0,8 - 2szt ; HTKSH2x2x0,8- 2szt
6- Korytko kablowe (lakier) KCOP 600H60L (N)HXH 4x50 - 2 szt; (N)HXH 4x1,5 - 2 szt; HDGs 2x1- 2szt;
7- Korytko kablowe KCOP 400H60 (N)HXCH 4x50/25 - 2 szt; (N)HXH 4x1,5/1,5 - 2 szt; JE-H(st)H 1x2x0,8 - 2szt ; HTKSH2x2x0,8- 2szt
8- Korytko kablowe KCOP 400H60 NHXH 4x50 - 2 szt; (N)HXH 4x1,5 - 2 szt; HDGs 2x1- 2szt;
9- Drabinka kablowa DGPO 400H60 (N)HXCH 4x50/25 - 2 szt;(N)HXCH 4x1,5/1,5 - 2 szt; JE-H(st)H1x2x0,8 - 2szt ; HTKSH2x2x0,8- 2szt
10-Drabinka kablowa DGPO 400H60 NHXH 4x50 - 2 szt; (N)HXH 4x1,5 - 2 szt; HDGs 2x1- 2szt;
11- UDF (N)HXCH 4x50/25 - 2 szt; NHXH 4x50 - 2 szt; (N)HXCH 4x1,5/1,5 - 2 szt; (N)HXH 4x1,5 - 2 szt;
JE-H(st)H 1x2x0,8 - 2szt ; HTKSH2x2x0,8- 2szt; HDGs 2x1- 2szt;
12- KSA (N)HXCH 4x50/25 - 2 szt; NHXH 4x50 - 2 szt; (N)HXCH 4x1,5/1,5 - 2 szt; (N)HXH 4x1,5 - 2 szt;
JE-H(st)H 1x2x0,8 - 2szt ; HTKSH2x2x0,8- 2szt; HDGs 2x1- 2szt;
13- OZO NHXCH 4x50/25 - 2 szt; (N)HXCH 4x1,5/1,5 - 2 szt, OZMO - JE-H(st)H 1x2x0,8 - 2szt ; HTKSH2x2x0,8- 2szt; HDGs 2x1- 2szt;
14- UDF JE-H(st)H 1x2x0,8 - 2szt ; HTKSH2x2x0,8- 2szt; HDGs 2x1- 2szt;


A-A
750
1500
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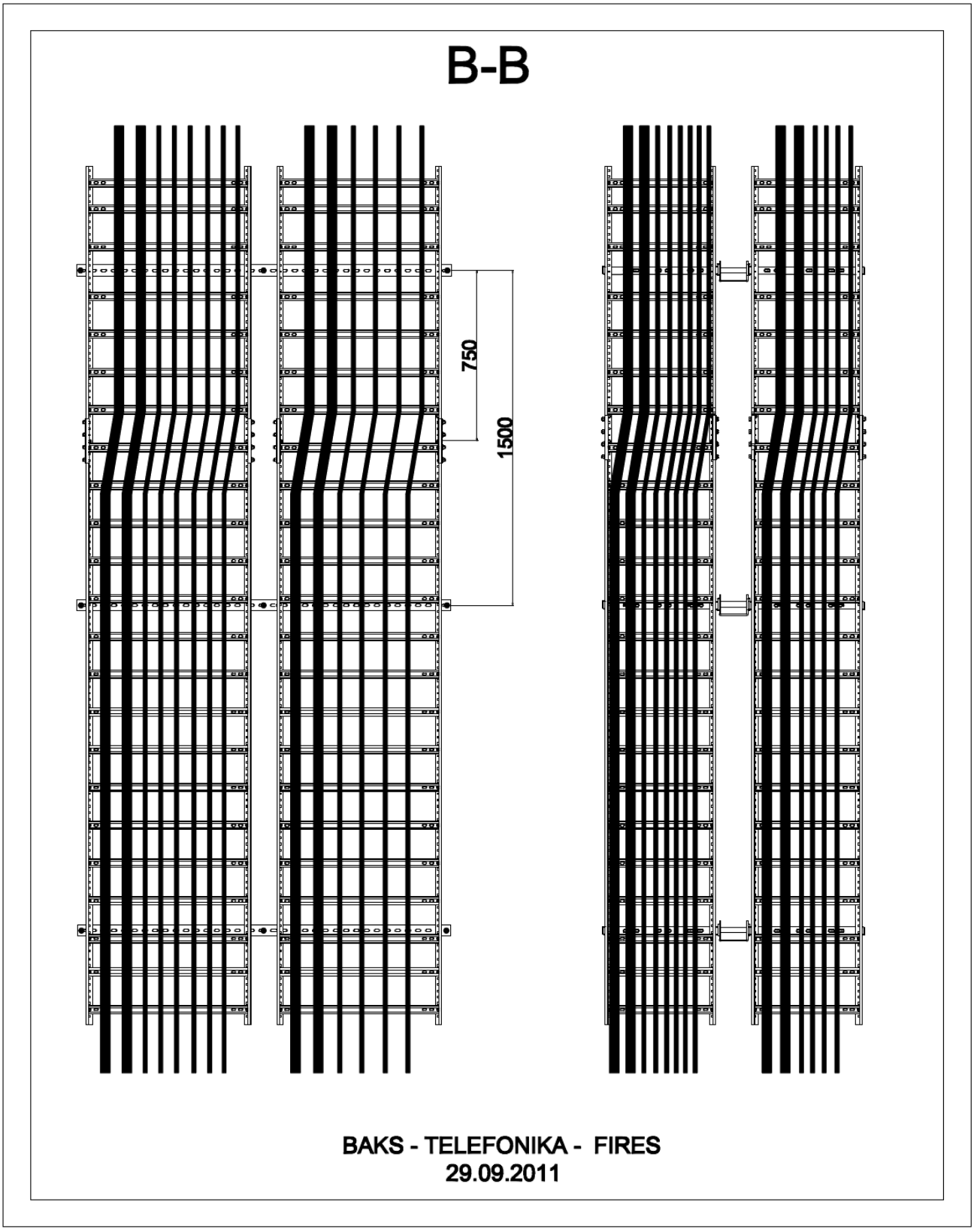
29.09.2011


B-B
750
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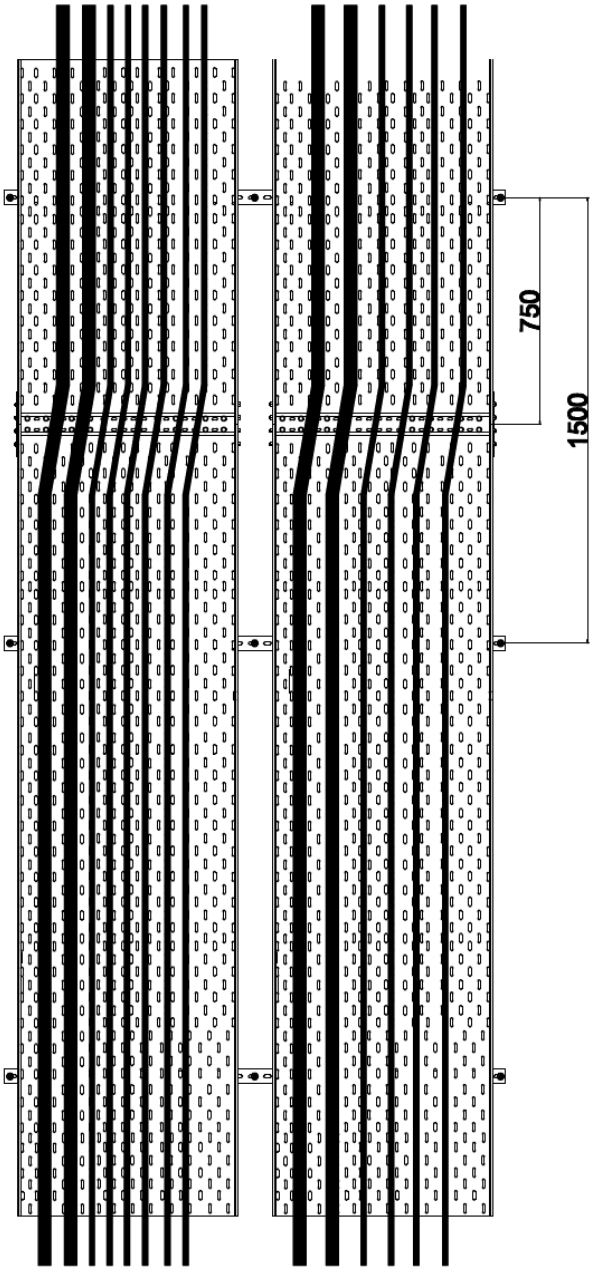
C-C



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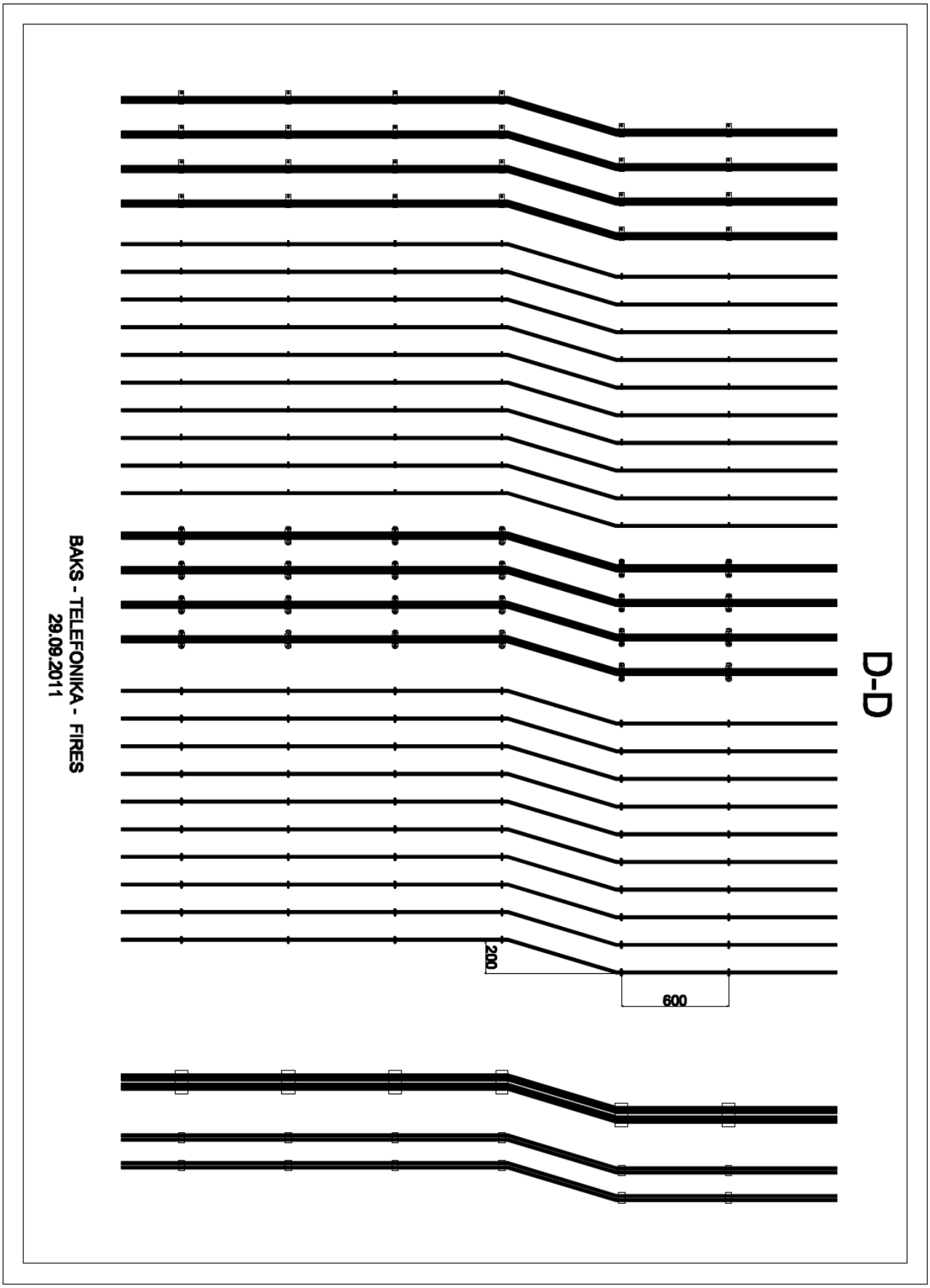
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600
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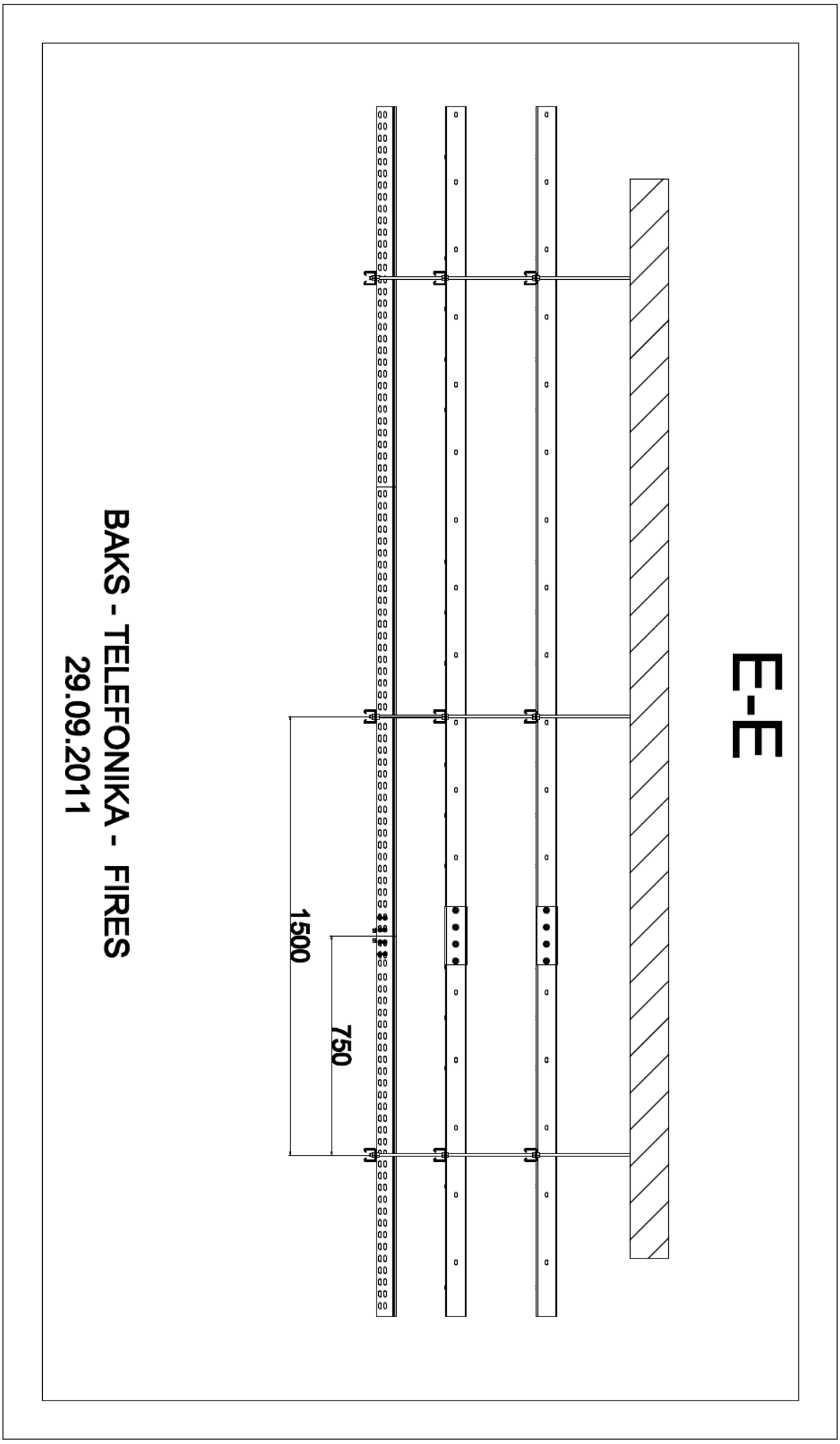
E-E
1500
750
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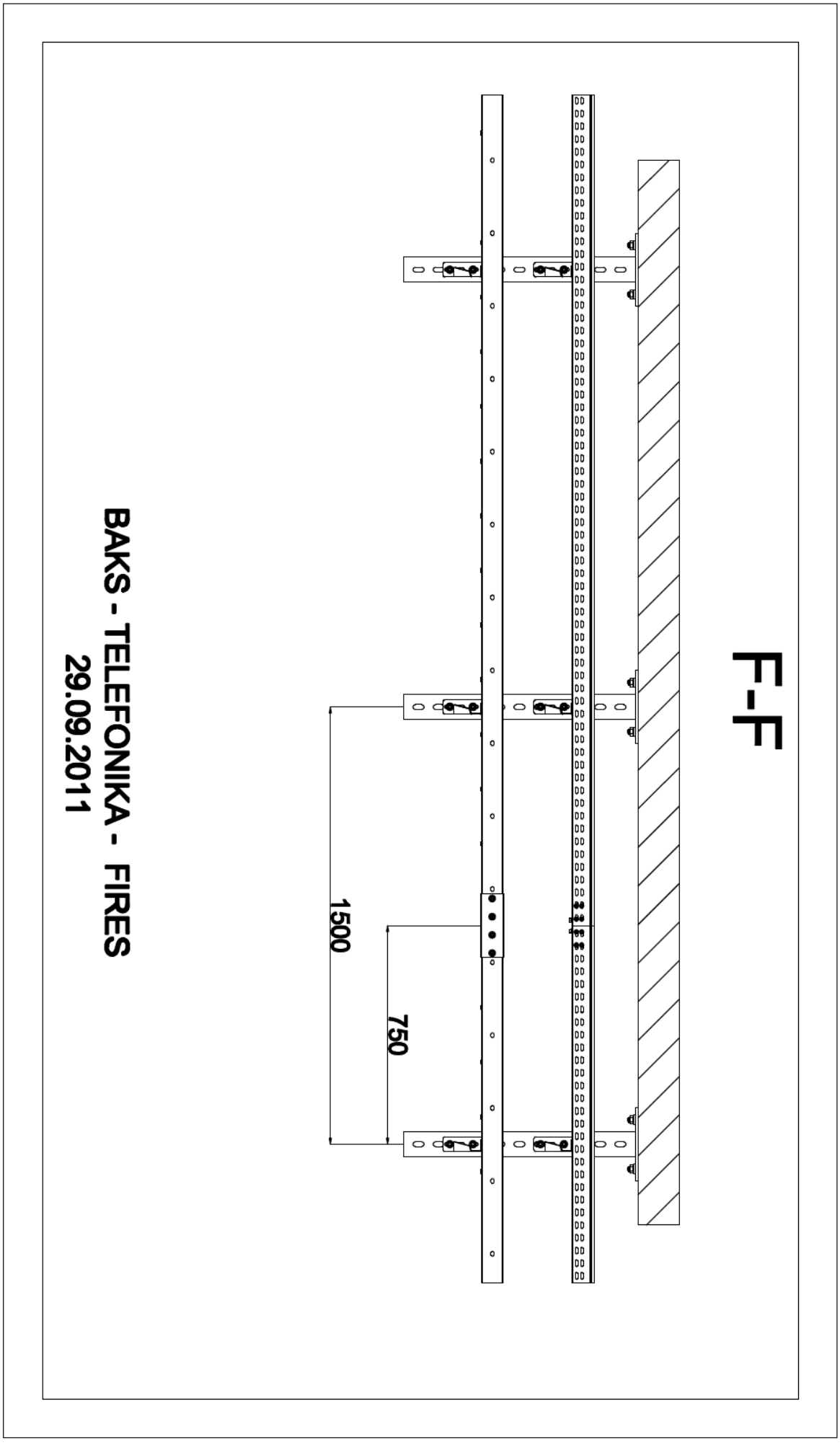
F-F
1500
750
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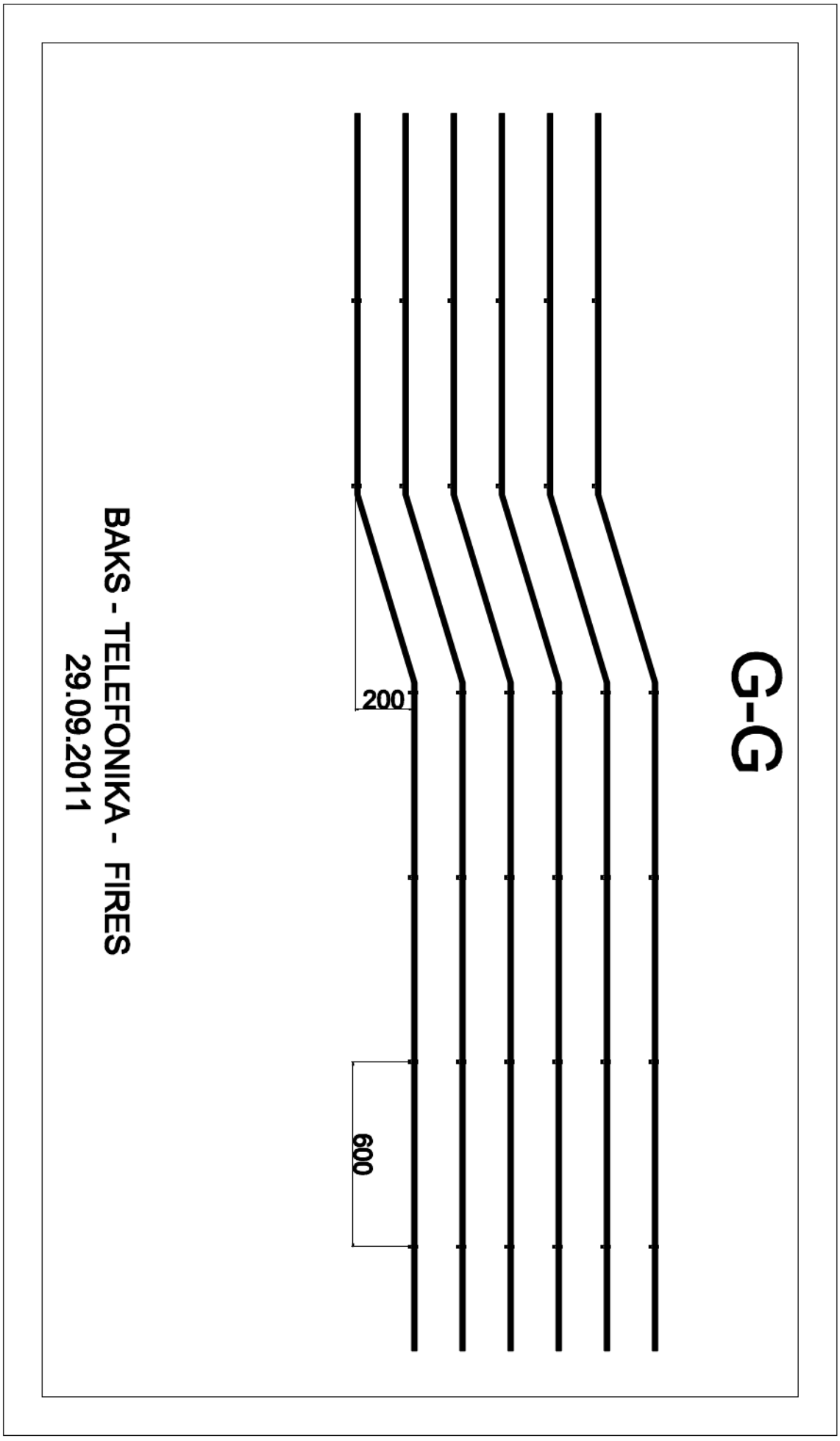
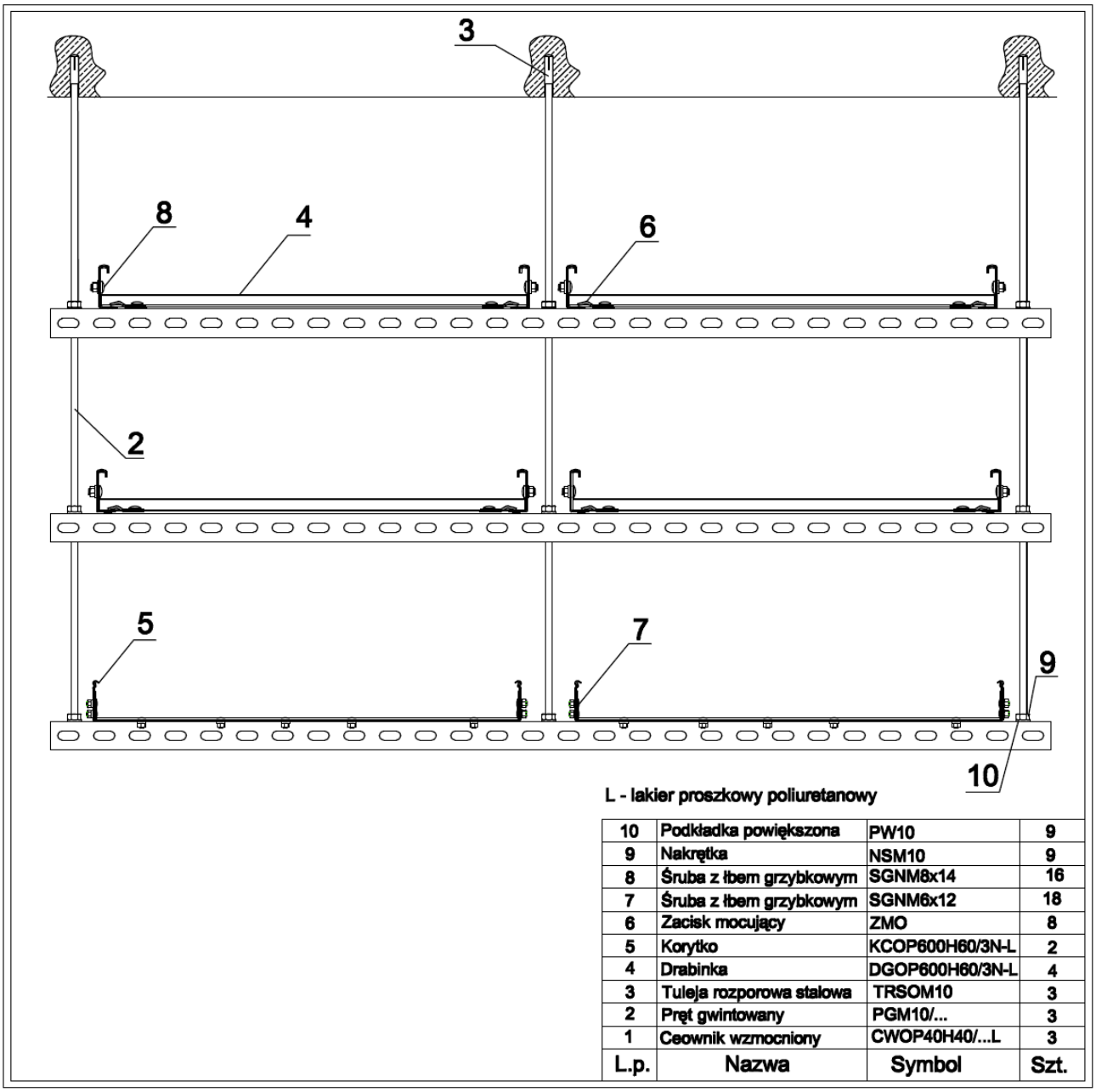
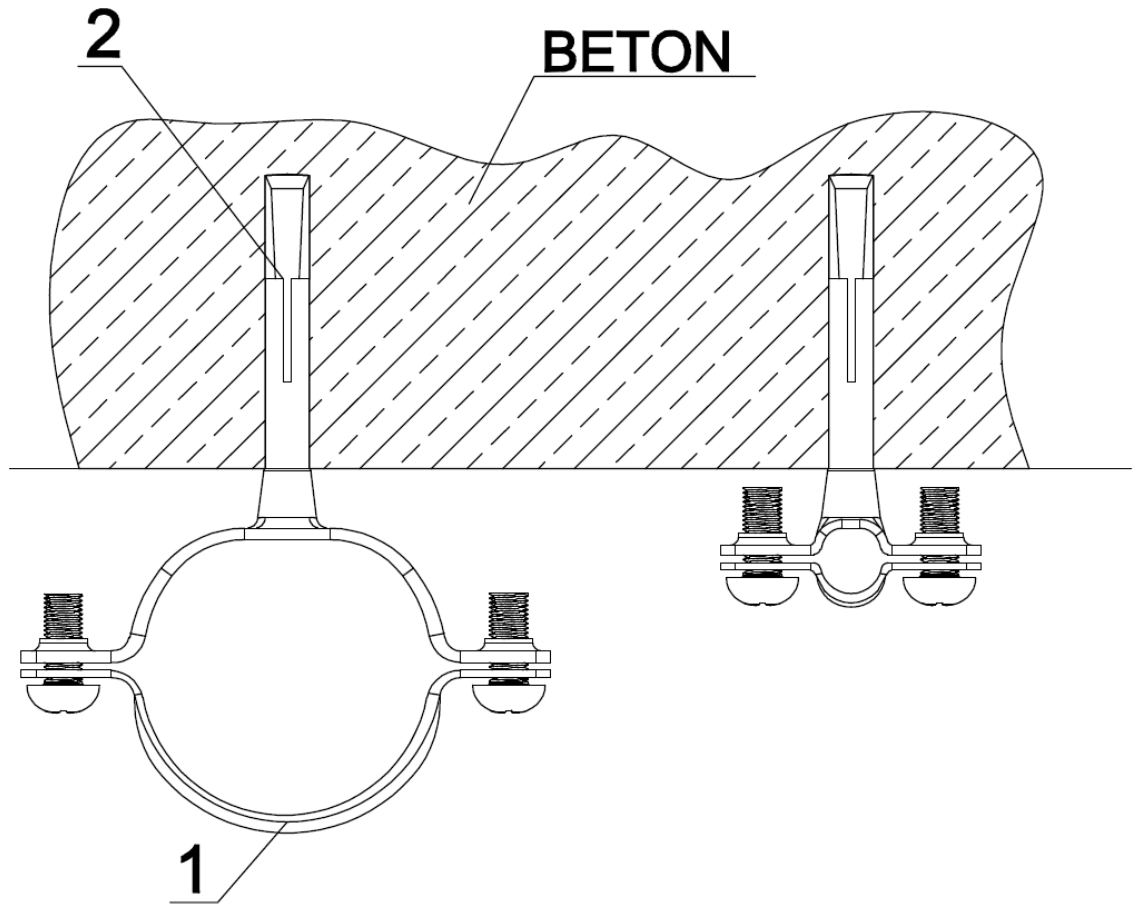

G-G
200
600
BAKS - TELEFONIKA - FIRES
29.09.2011

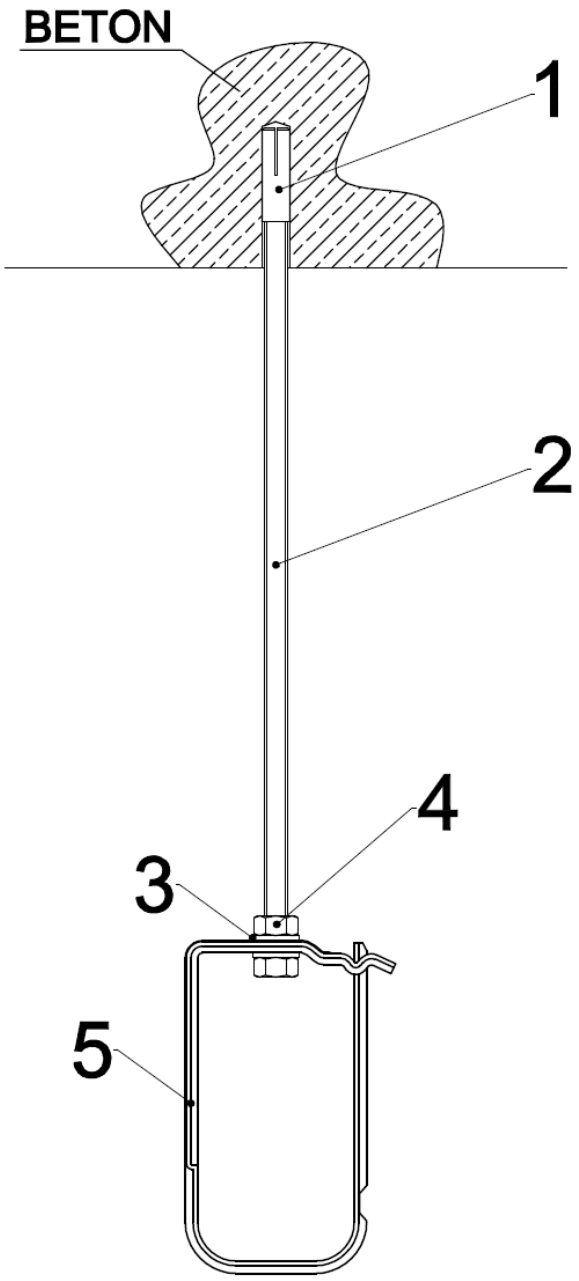


L - lakier proszkowy poliuretanowy

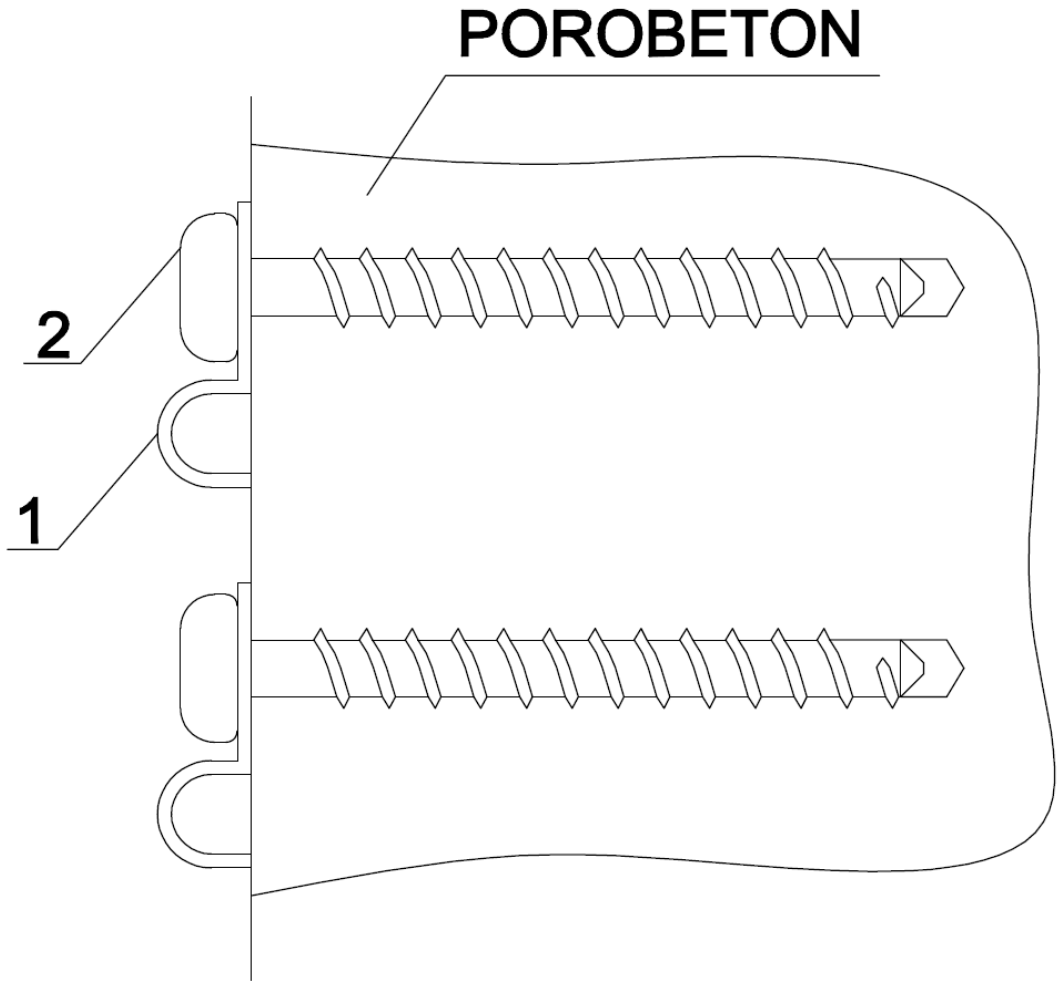
L.p.	Nazwa	Symbol	Szt.
10	Podkładka powiększona	PW10	9
9	Nakrętka	NSM10	9
8	Śruba z łbem grzybkowym	SGNM8x14	16
7	Śruba z łbem grzybkowym	SGNM6x12	18
6	Zacisk mocujący	ZMO	8
5	Korytko	KCOP600H60/3N-L	2
4	Drabinka	DGOP600H60/3N-L	4
3	Tuleja rozporowa stalowa	TRSOM10	3
2	Pręt gwintowany	PGM10/...	3
1	Ceownik wzmocniony	CWOP40H40/...L	3



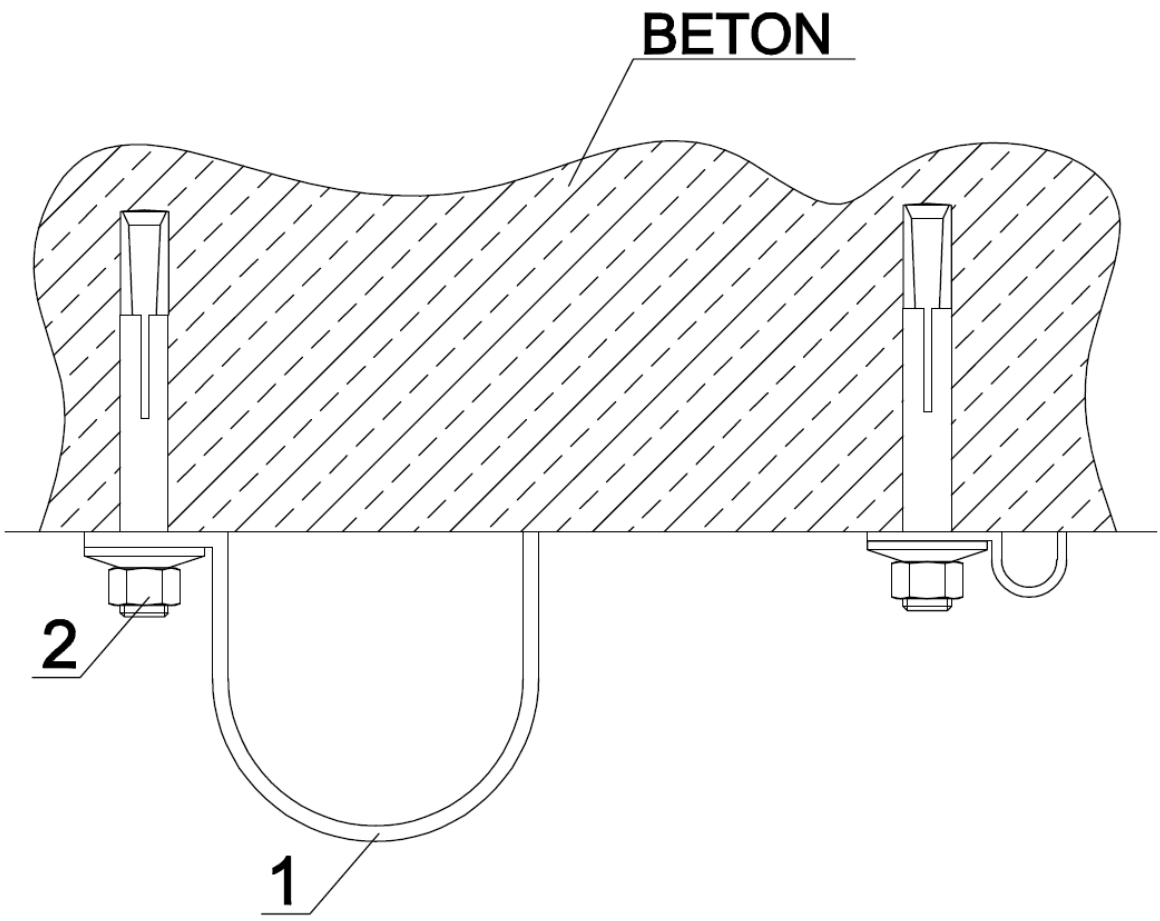
L.p.	Nazwa	Symbol	Szt.
2	Śruba rozporowa	SRBOM6x30	2
1	Obejma kablowa	KSA...	2



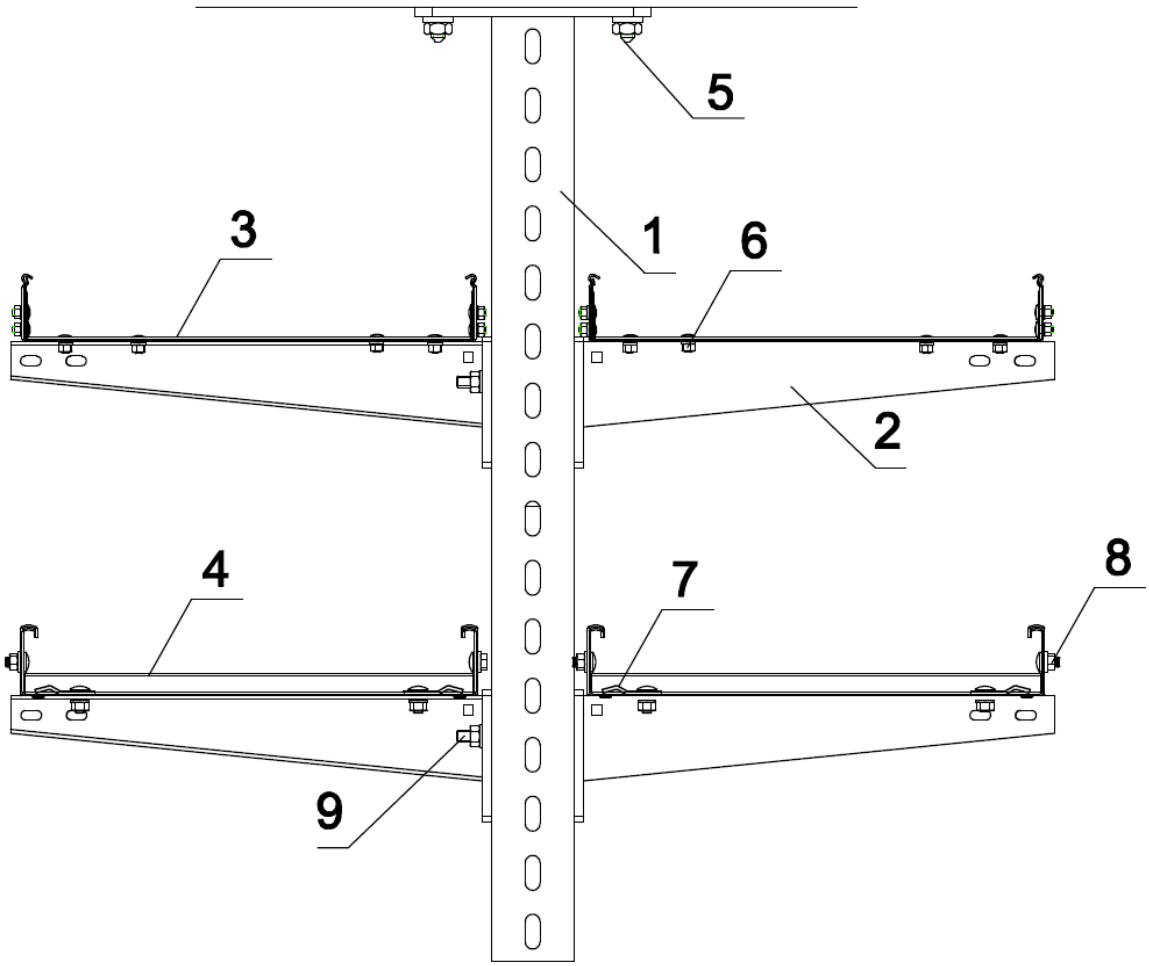
L.p.	Nazwa	Symbol	Szt.
5	Obejma zatrzaskowa	OZMO	1
4	Nakrętka	NSM6	2
3	Podkładka	PP6	2
2	Pręt gwintowany	PGM6/...	1
1	Tuleja rozporowa stalowa	TRSOM6	1



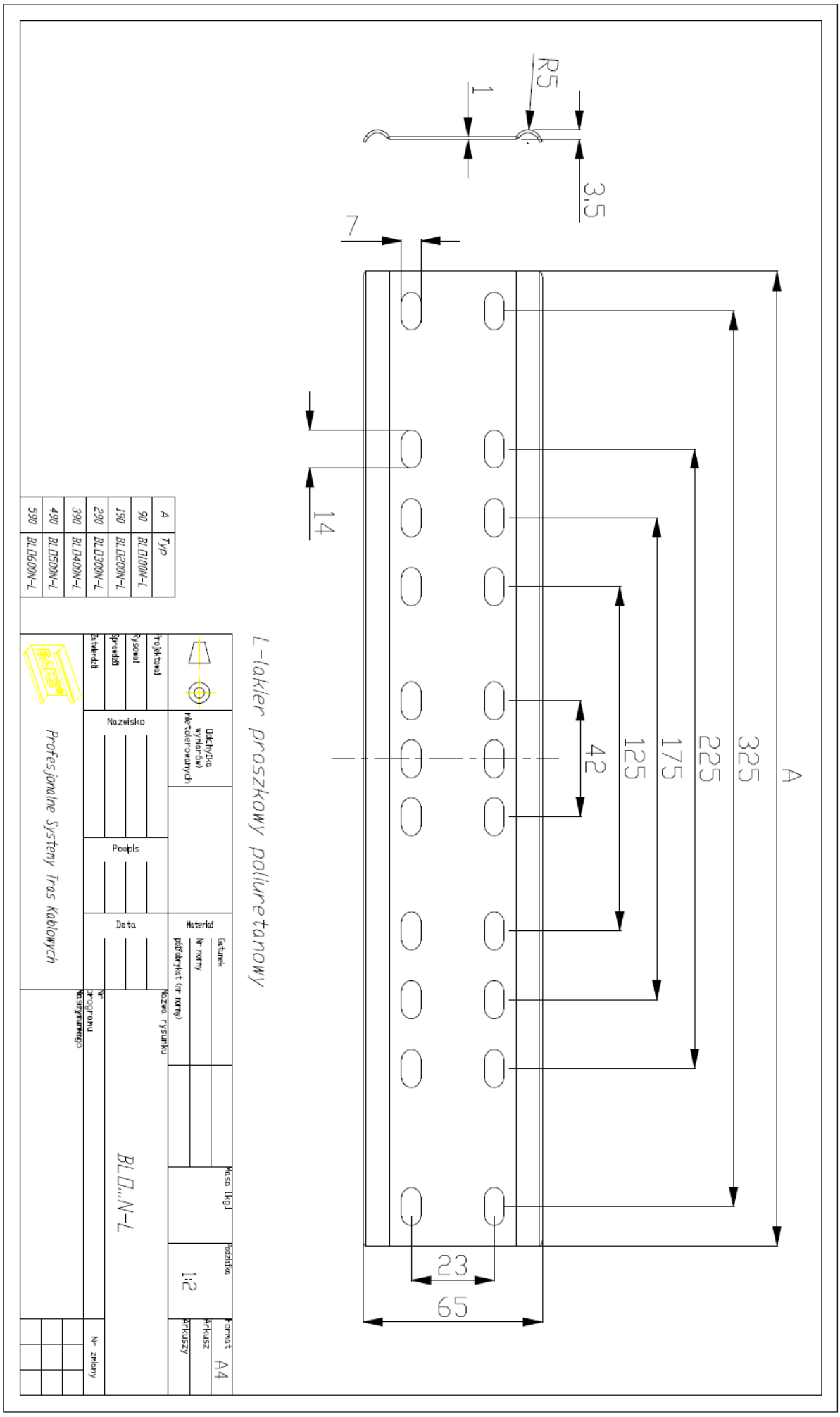
L.p.	Nazwa	Symbol	Szt.
2	Śruba do betonu	SBO 5x60	2
1	Uchwyt kabla	UDF...	2



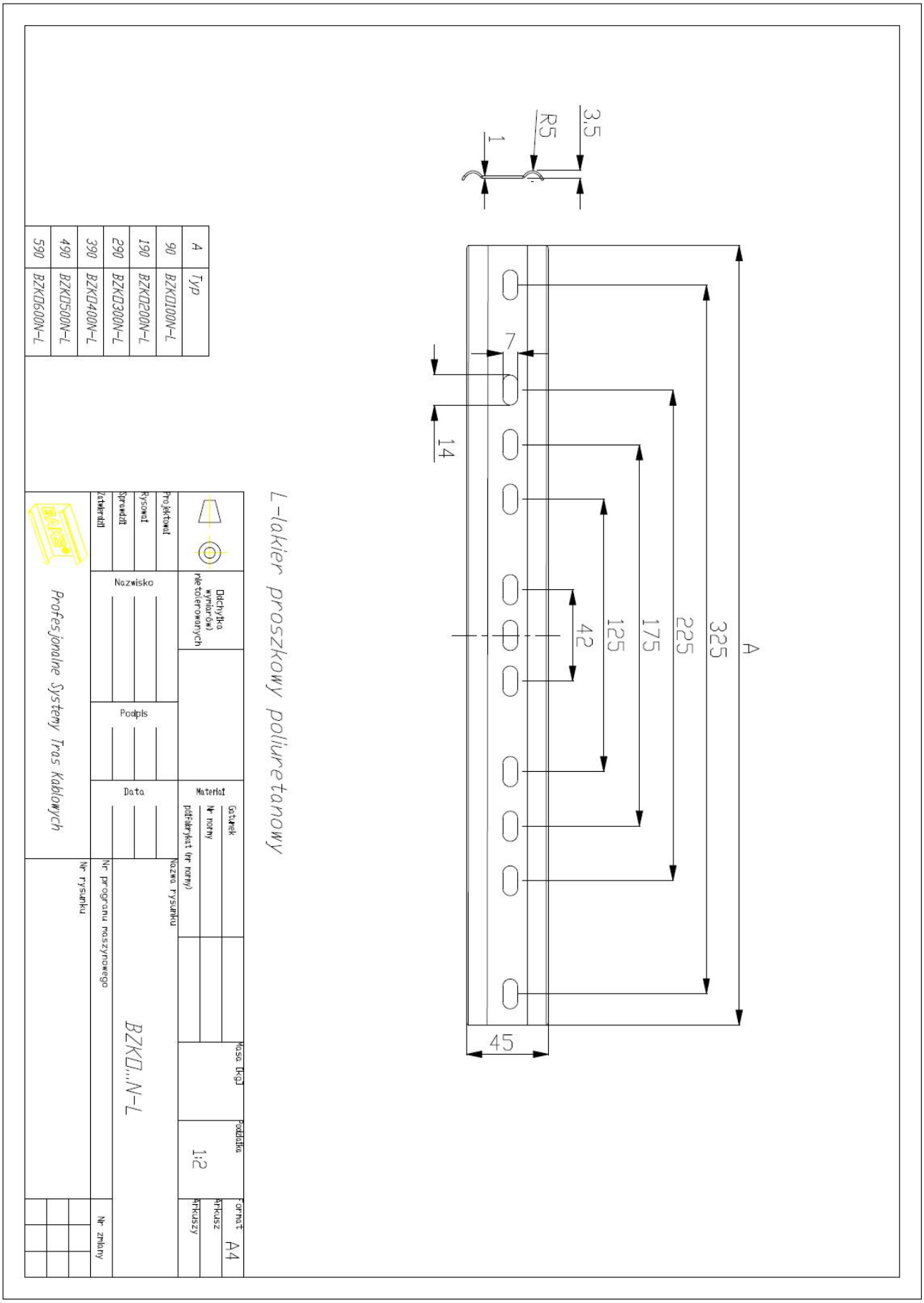
L.p.	Nazwa	Symbol	Szt.
2	Śruba rozporowa	SROM6x30	2
1	Uchwyt kabla	UDF...	2



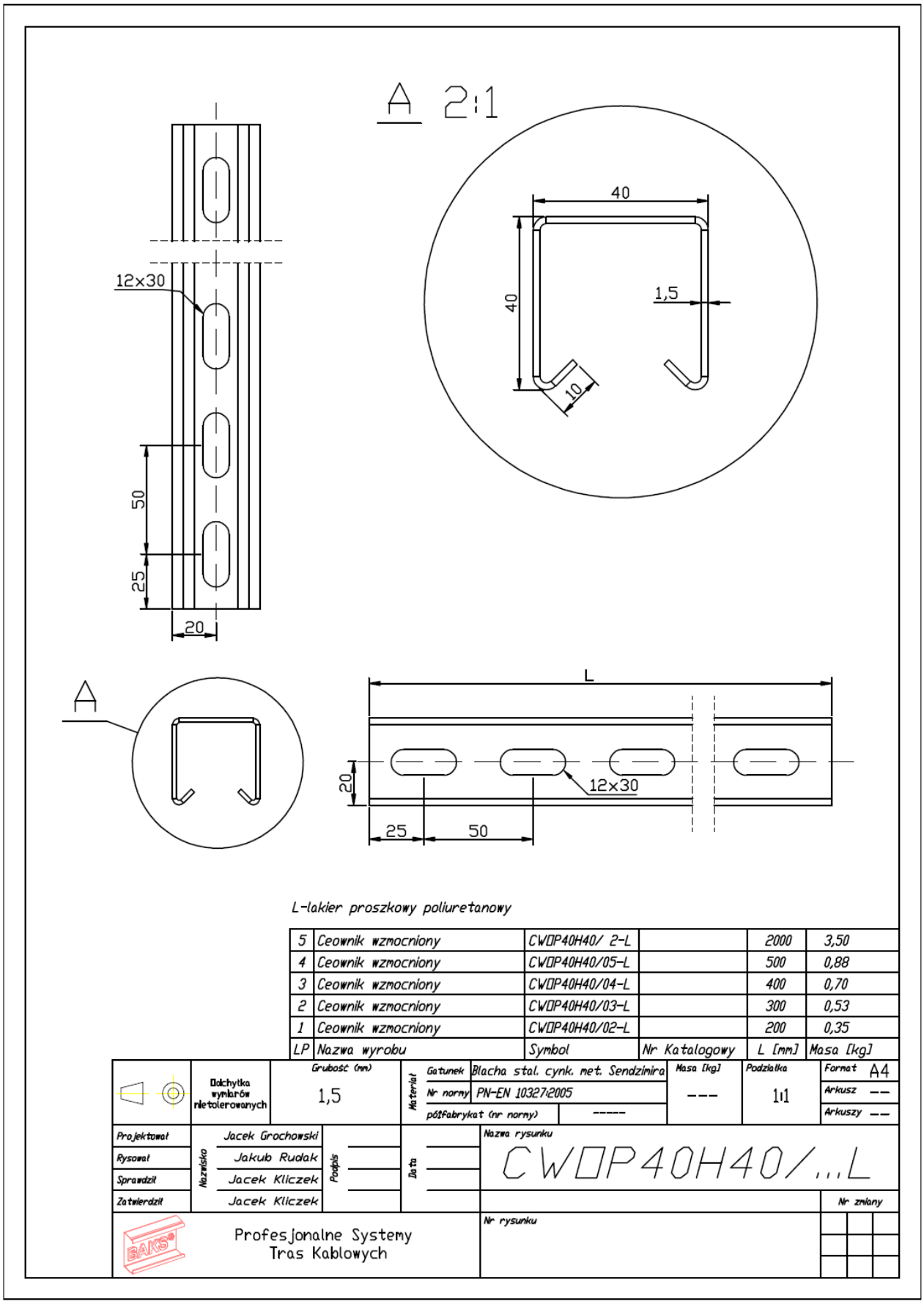
L.p.	Nazwa	Symbol	Szt.
9	Śruba	SMM10x80	2
8	Śruba z łbem grzybkowym	SGNM8x12	8
7	Zacisk mocujący	ZMO	2
6	Śruba z łbem grzybkowym	SGNM6x12	16
5	Śruba tulejowa rozporowa	PSROM10x80	2
4	Drabinka	DGOP400H60/3N	2
3	Korytko	KCOP400H60/3N	2
2	Wysięgnik	WWCTO400	4
1	Wspornik sufitowy	WPCOE700	1



A	Typ
90	BL□100N-L
190	BL□200N-L
290	BL□300N-L
390	BL□400N-L
490	BL□500N-L
590	BL□600N-L



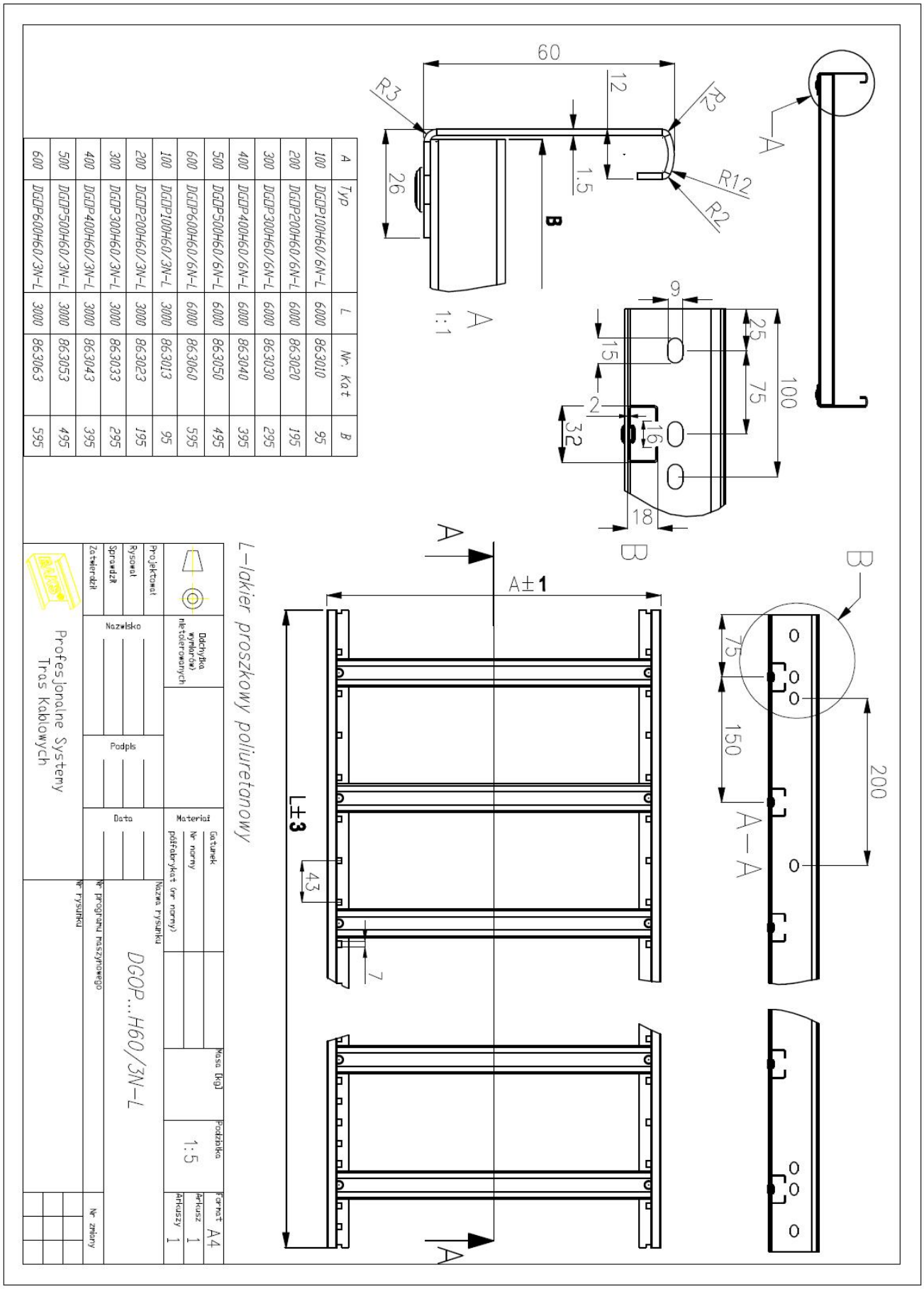
A	Typ
90	BZKO100N-L
190	BZKO200N-L
290	BZKO300N-L
390	BZKO400N-L
490	BZKO500N-L
590	BZKO600N-L



L-lakier proszkowy poliuretanowy

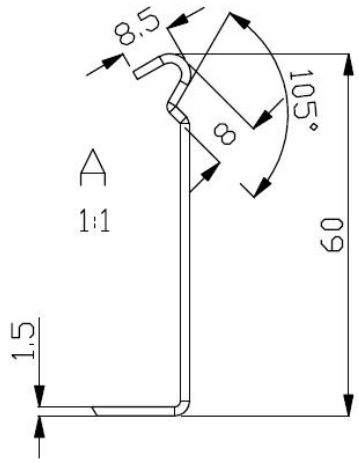
5	Ceownik wzmocniony	CW□P40H40/ 2-L		2000	3,50
4	Ceownik wzmocniony	CW□P40H40/05-L		500	0,88
3	Ceownik wzmocniony	CW□P40H40/04-L		400	0,70
2	Ceownik wzmocniony	CW□P40H40/03-L		300	0,53
1	Ceownik wzmocniony	CW□P40H40/02-L		200	0,35
LP	Nazwa wyrobu	Symbol	Nr Katalogowy	L [mm]	Masa [kg]

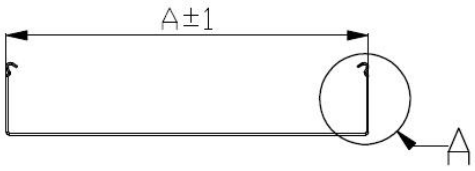
	Dachytka wymiarów nietolerowanych	Grubość (mm) 1,5	Materiał: Gatunek: Blacha stal. cynk. met. Sendzimira; Nr normy: PN-EN 10327:2005; półfabrykat (nr normy): -----	Masa [kg] ---	Podziałka 1:1	Format A4; Arkusz --; Arkuszy --
Projektował: Jacek Grochowski	Nazwisko	Podpis	Data	Nazwa rysunku: CW□P40H40/...L		
Rysował: Jakub Rudak						
Sprawdził: Jacek Kliczek						
Zatwierdził: Jacek Kliczek						Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku		

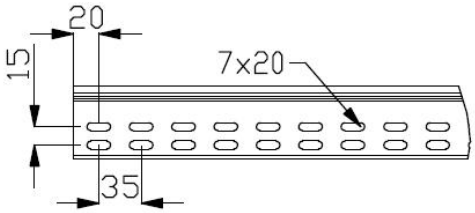


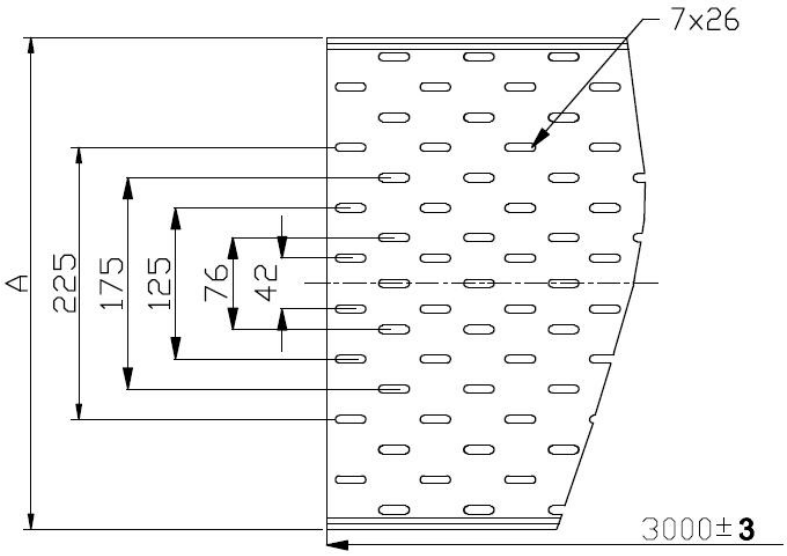
A	Typ	L	Nr. Kat	B
100	DGOP100H60/6N-L	6000	863010	95
200	DGOP200H60/6N-L	6000	863020	195
300	DGOP300H60/6N-L	6000	863030	295
400	DGOP400H60/6N-L	6000	863040	395
500	DGOP500H60/6N-L	6000	863050	495
600	DGOP600H60/6N-L	6000	863060	595
100	DGOP100H60/3N-L	3000	863013	95
200	DGOP200H60/3N-L	3000	863023	195
300	DGOP300H60/3N-L	3000	863033	295
400	DGOP400H60/3N-L	3000	863043	395
500	DGOP500H60/3N-L	3000	863053	495
600	DGOP600H60/3N-L	3000	863063	595

Typ	Szerokość A(mm)	Długość L(mm)
KC□P100H60/3N-L	100	3000
KC□P200H60/3N-L	200	3000
KC□P300H60/3N-L	300	3000
KC□P400H60/3N-L	400	3000
KC□P500H60/3N-L	500	3000
KC□P600H60/3N-L	600	3000



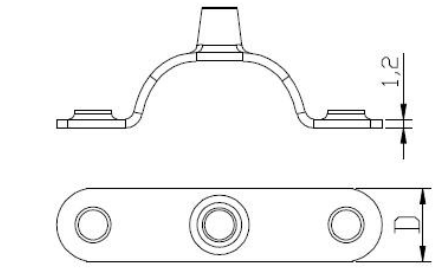


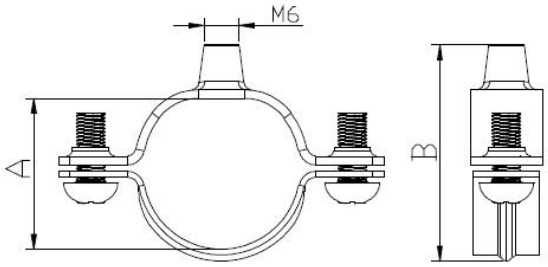


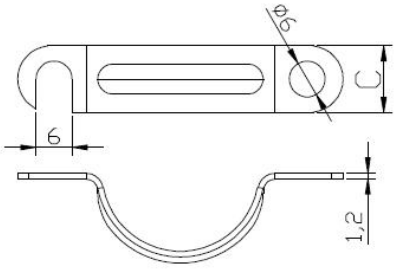


L-lakier proszkowy poliuretanowy

	Odchyłka wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka	Format A4
			Nr normy				Arkusz
			półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku: KC□P...H60/3N-L			
Rysował							
Sprawdził							
Zatwierdził				Nr programu maszynowego			Nr zmiany
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

Dachyłka wymiarów nietolerowanych

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

Masa [kg]

Podziałka: 1:1

Format A4; Arkusz 1; Arkuszy 1

Projektował	J.GROCHOWSKI		20.10.04
Rysował	J.GROCHOWSKI		20.10.04
Sprawdził	T.WŁODARCZYK		20.10.04
Zatwierdził	J.KLICZEK		20.10.04

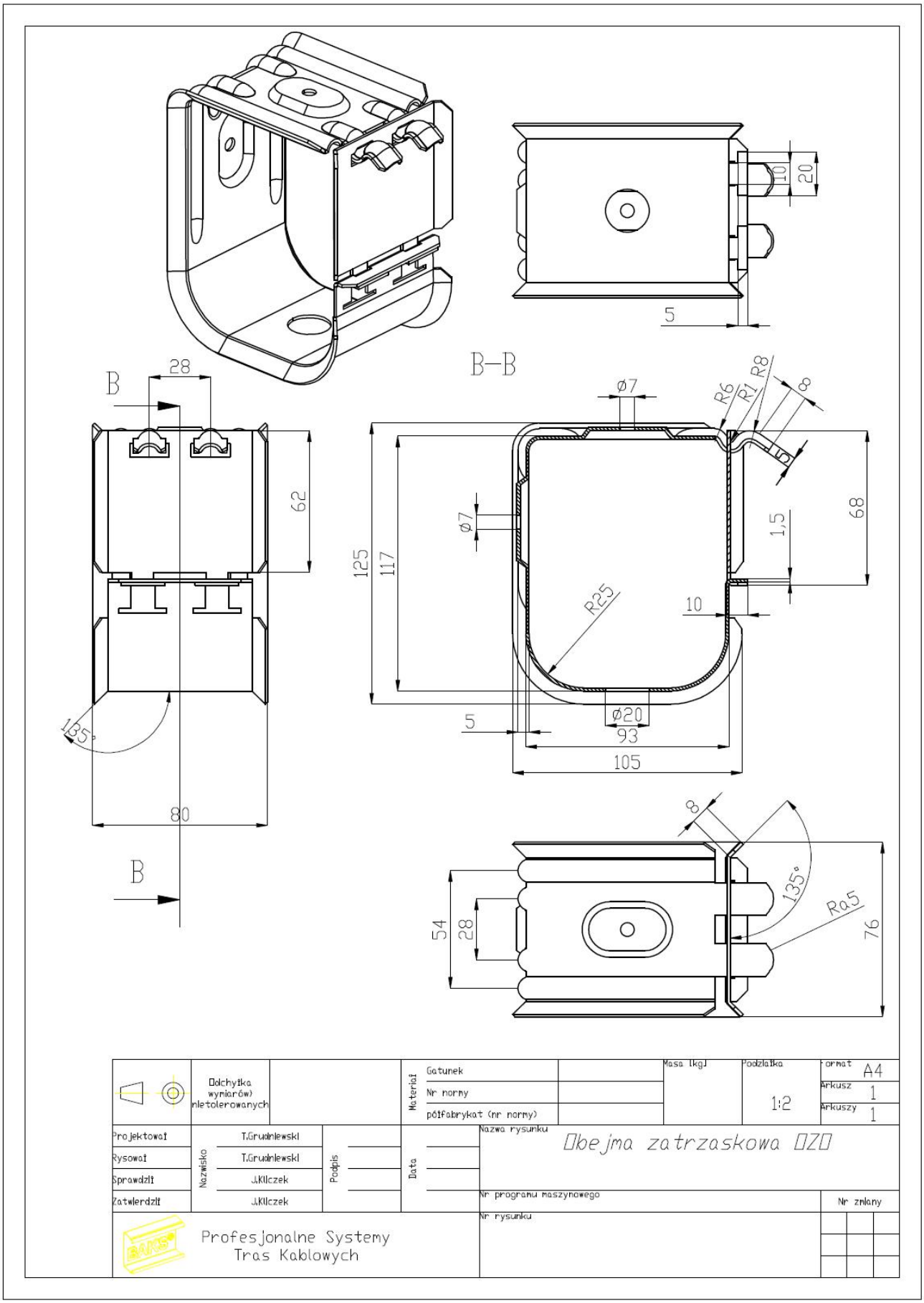
Nazwa rysunku: KSA

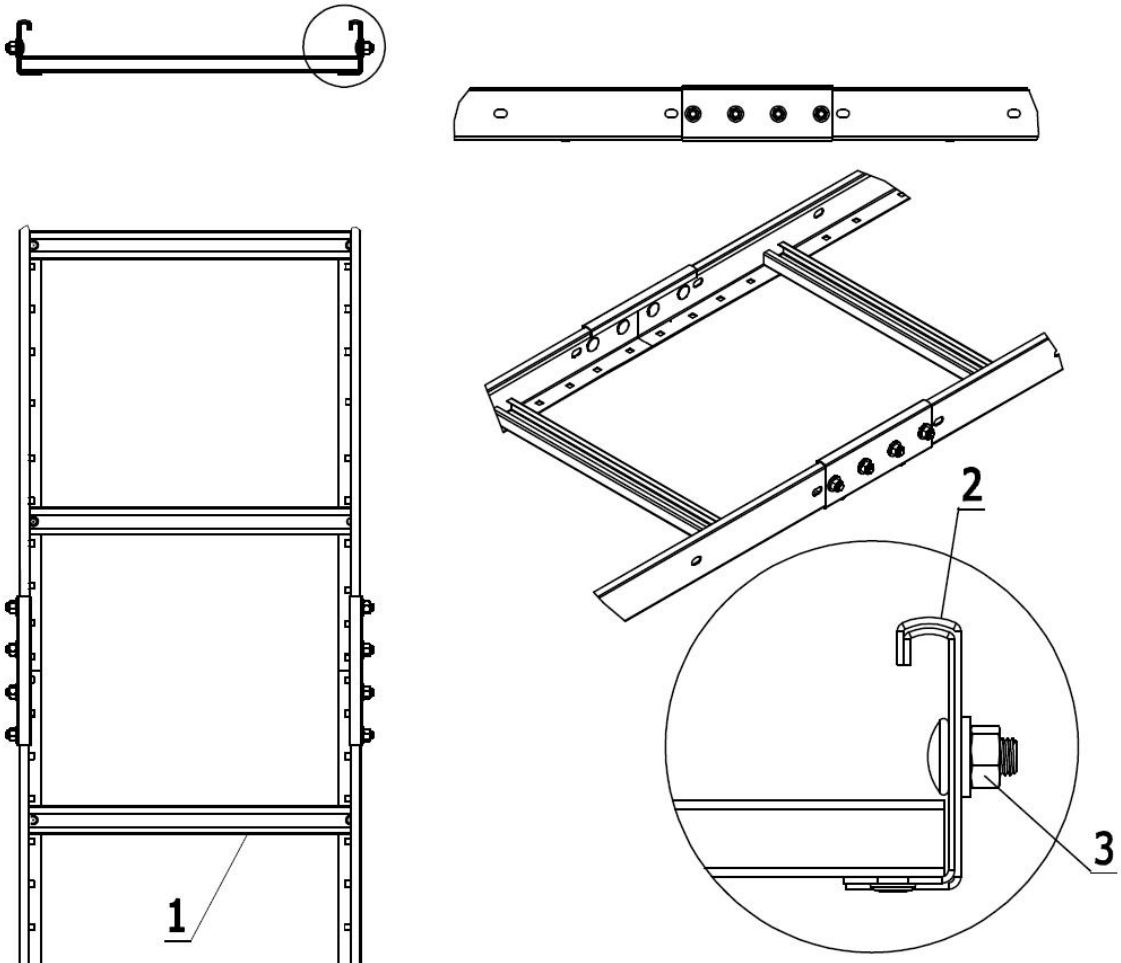
Nr programu maszynowego: ---

Nr zmiany

Profesjonalne Systemy Tras Kablowych

Nr rysunku: ---


B
28
62
135°
80
B
B–B
ø7
R6
R1
R8
8
ø7
125
117
1,5
68
R25
10
5
ø20
93
105
8
135°
Ra5
54
28
76
10
20
5
Odchyłka wymiarów nietolerowanych
Materiał
Gatunek
Nr normy
półfabrykat (nr normy)
Masa [kg]
Podziałka
1:2
Format
A4
Arkusz
1
Arkuszy
1
Projektował
T.Grudniewski
Rysował
T.Grudniewski
Sprawdził
J.Kluczek
Zatwierdził
J.Kluczek
Nazwisko
Podpis
Data
Nazwa rysunku
Obejma zatrzaskowa OZO
Nr programu maszynowego
Nr zmiany
Nr rysunku
Profesjonalne Systemy
Tras Kablowych



Pos.	Benennung	Zeichnung-Nr	Material	Stck.	Katalogs Nr.
3	Śruba	SGN M8x14		8	
2	Łącznik	LDDCH60N-L		2	
1	Drabinka	DGDP600H60/3N-L		2	

Odchyłka wymiarów nietolerowanych

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

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

	Nazwisko	Podpis	Data
Projektował			
Rysował			
Sprawdził			
Zatwierdził			

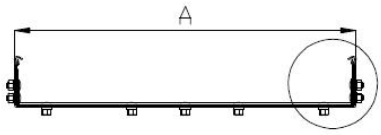
Nazwa rysunku: DGDP600H60/3N-L

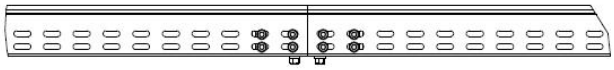
Nr programu maszynowego

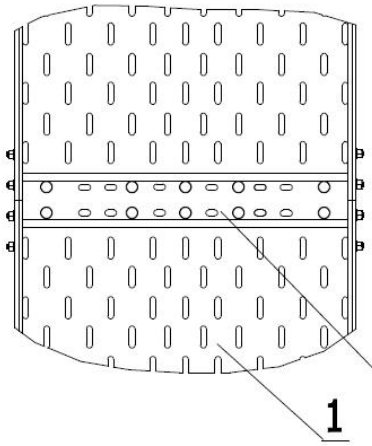
Nr rysunku

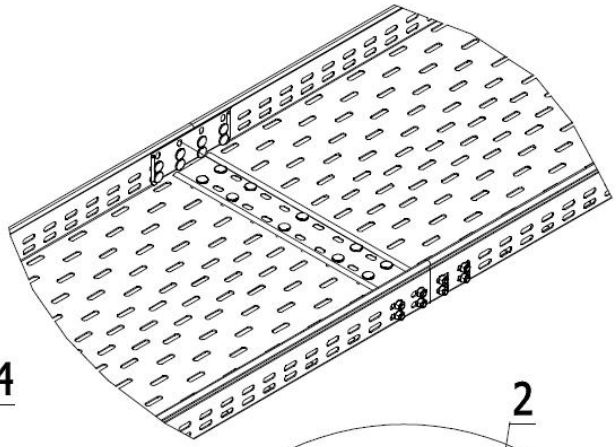
Nr zmiany

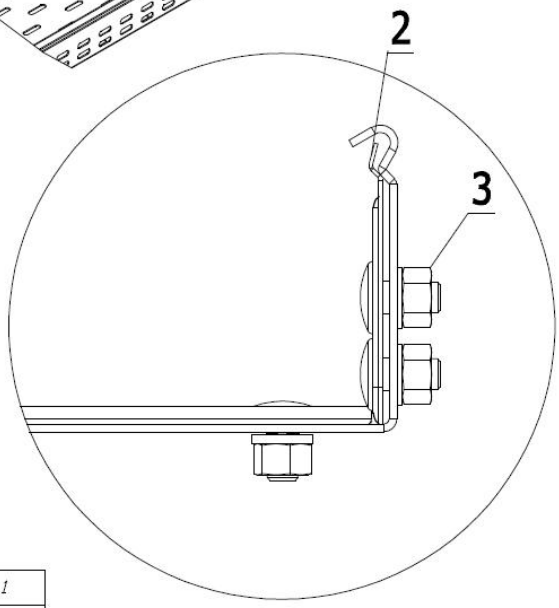
Profesjonalne Systemy Tras Kablowych











Poz.1		Poz.4
A	Typ	Typ
100	KC□P100H60/3N-L	BL□100N-L
200	KC□P200H60/3N-L	BL□200N-L
300	KC□P300H60/3N-L	BL□300N-L
400	KC□P400H60/3N-L	BL□400N-L
500	KC□P500H60/3N-L	BL□500N-L
600	KC□P600H60/3N-L	BL□600N-L

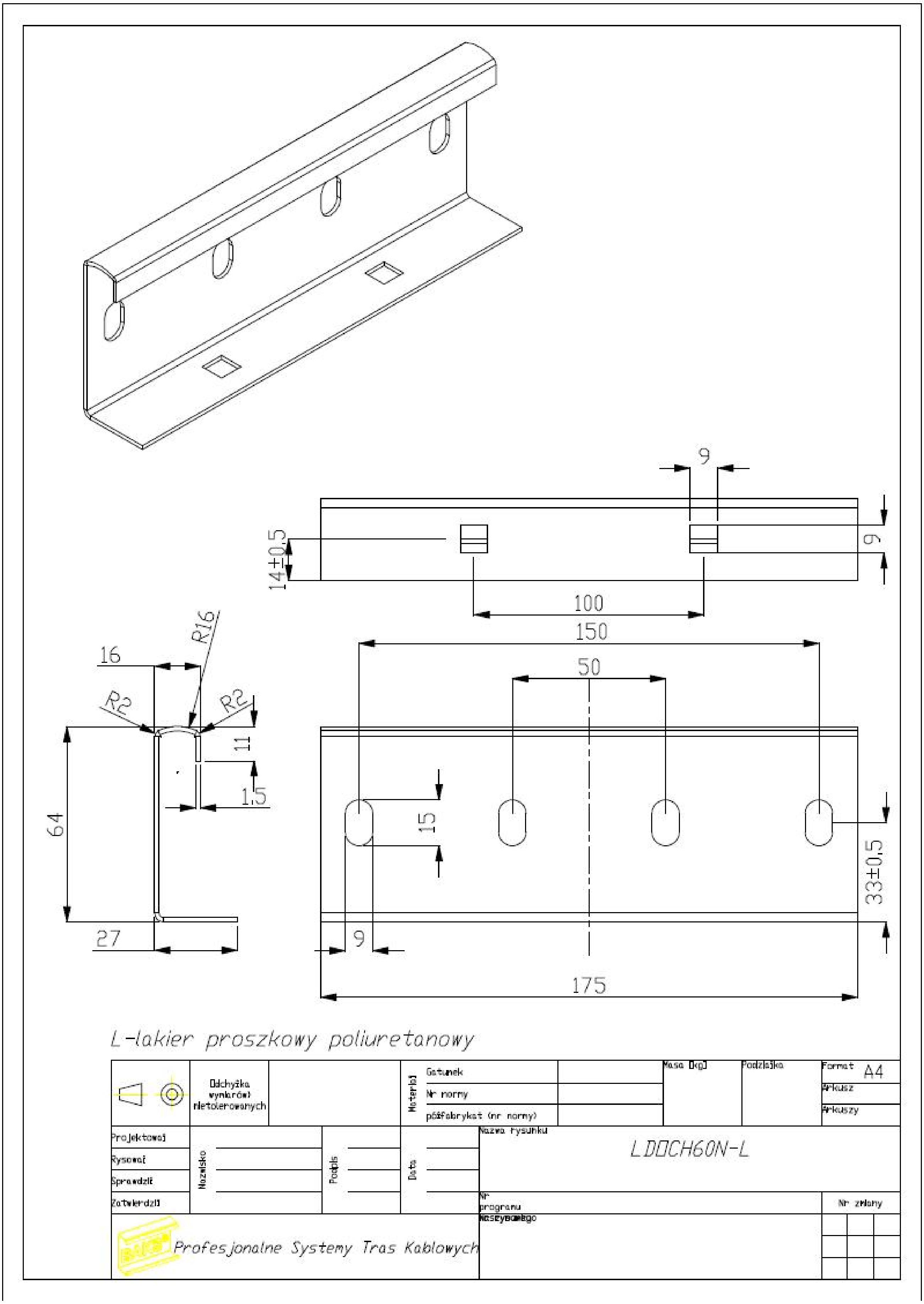
Pos.	Nazwa	Symbol	Ilość
4	Blacha lacznikowa	BL□600N-L	1
3	Śruba	SGN M6x12	26
2	Łącznik	LP□PH60N-L	2
1	Koryto	KC□P600H60/3N-L	2

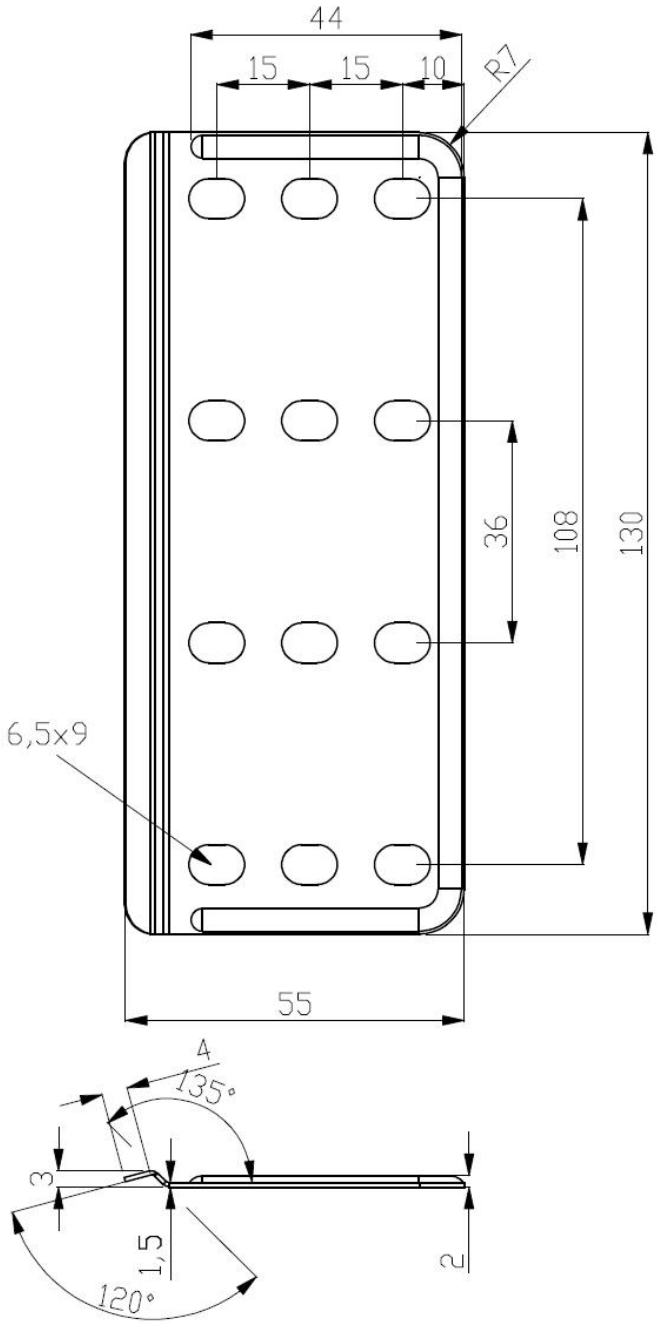
Odchyłka wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	Format A4
			Nr normy				Arkusz 1
			półfabrykat (nr normy)				Arkuszy 1

Projektował	Nazwisko	Podpis	Data	Nazwa rysunku: Połączenie KC□P600H60/3N-L
Rysował				
Sprawdził				
Zatwierdził				Nr programu maszynowego / Nr rysunku

Profesjonalne Systemy Tras Kablowych

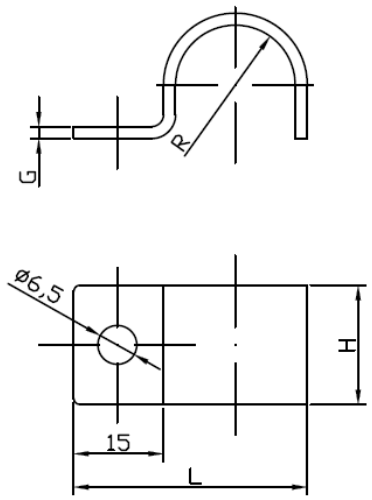
Nr zmiany


9
14±0,5
9
100
150
50
16
R16
R2
R2
11
1,5
64
15
33±0,5
27
9
175
L-lakier proszkowy poliuretanowy
Odchyłka wymiarów nietolerowanych
Materiał
Gatunek
Nr normy
półfabrykat (nr normy)
Masa [kg]
Podziałka
Format A4
Arkusz
Arkuszy
Projektował
Rysował
Sprawdził
Zatwierdził
Nazwisko
Podpis
Data
Nazwa rysunku
LDOCH60N-L
Nr programu
Nr zmiany
Profesjonalne Systemy Tras Kablowych



L-lakier proszkowy poliuretanowy

Dachyłka wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka 1:1	Format A4	
		Nr normy				Arkusz	
		półfabrykat (nr normy)				Arkuszy	
Projektował:	J.GROCHOWSKI			Nazwa rysunku: LPDPH60N-L			
Rysował:	J.Grochowski						
Sprawdził:	T.WŁODARCZYK						
Zatwierdził:	J.KLICZEK			Nr programu maszynowego		Nr zmiany	
Profesjonalne Systemy Tras Kablowych				Nr rysunku			



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

Dachyłka wymiarów nietolerowanych: ±0,5

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

Masa [kg]: ---

Podziałka: 1:1

Format: A4; Arkusz: --; Arkuszy: --

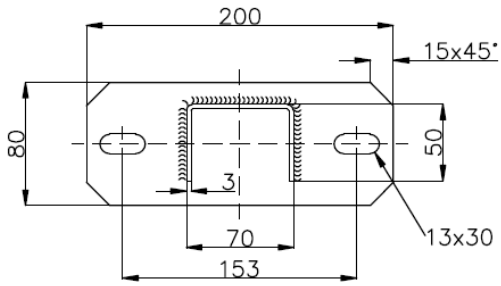
	Nazwisko	Podpis	Data
Projektował	Jacek Grochowski		20.10.05
Rysował	Jakub Rudak		20.02.08
Sprawdził	Jacek Kliczek		20.02.08
Zatwierdził	Jacek Kliczek		20.02.08

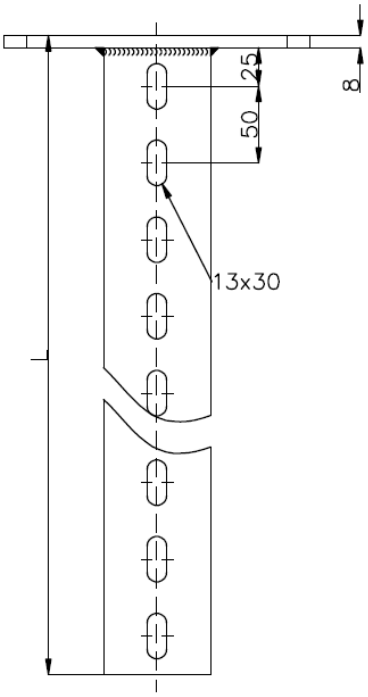
Nazwa rysunku: UDF 5-43

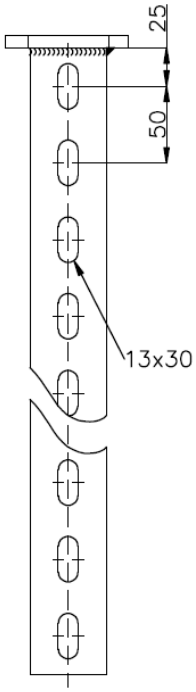
Nr zmiany:

BAKS® Profesjonalne Systemy Tras Kablowych

Nr rysunku: 4055.....

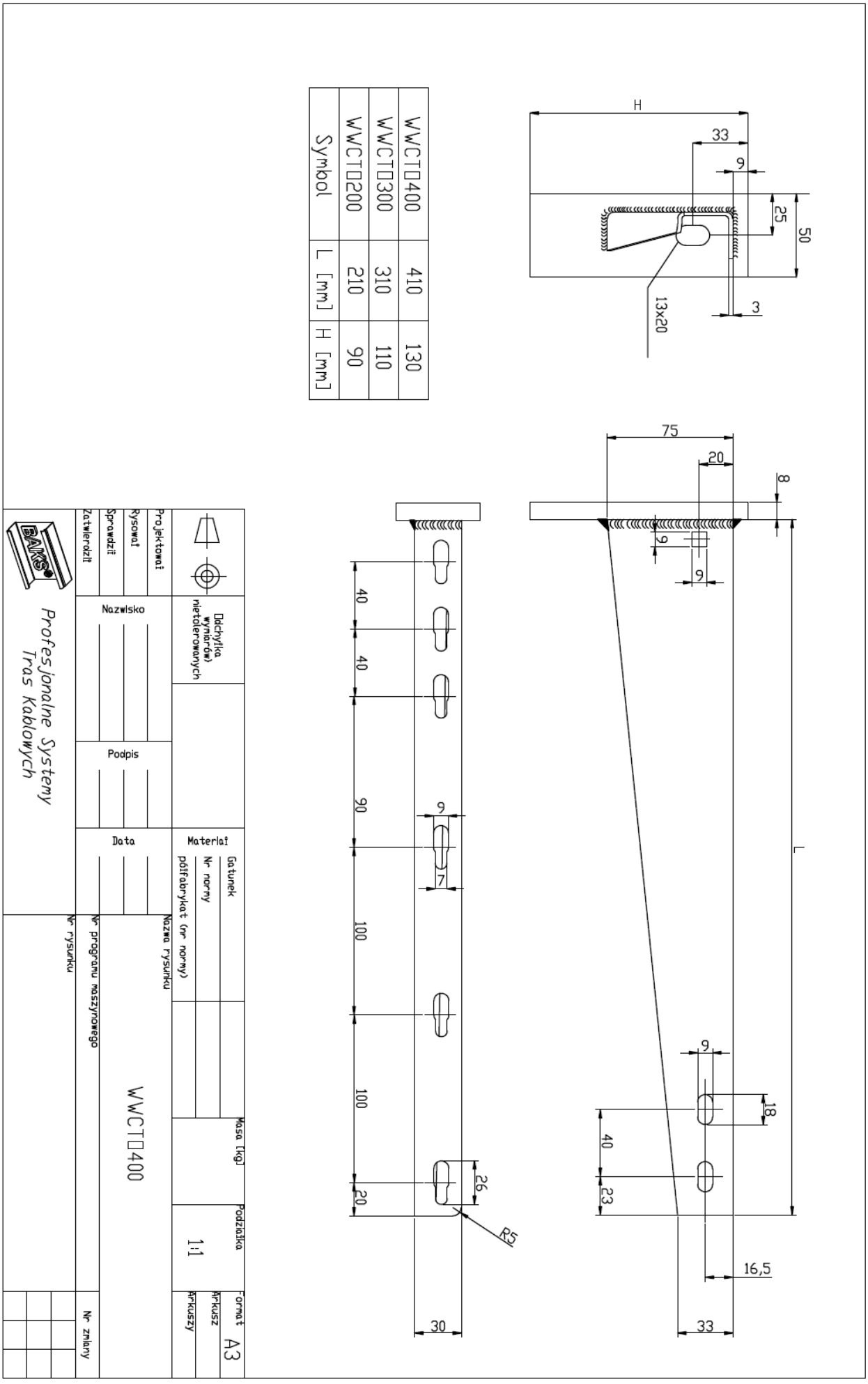




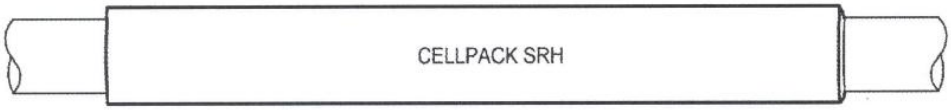


11	Wspornik sufitowy	WPCOE3000N	3000
10	Wspornik sufitowy	WPCOE2000N	2000
9	Wspornik sufitowy	WPCOE1000N	1000
8	Wspornik sufitowy	WPCOE900N	900
7	Wspornik sufitowy	WPCOE800N	800
6	Wspornik sufitowy	WPCOE700N	700
5	Wspornik sufitowy	WPCOE600N	600
4	Wspornik sufitowy	WPCOE500N	500
3	Wspornik sufitowy	WPCOE400N	400
2	Wspornik sufitowy	WPCOE300N	300
1	Wspornik sufitowy	WPCOE200N	200
LP	Nazwa wyrobu	Symbol	L

	Odchyłka wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	Format
				Nr normy				Arkusz __
				półfabrykat (nr normy)	-----	---		Arkuszy __
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku	WPCOE...N			
Rysował								
Sprawdził								
Zatwierdził								Nr zmiany
BAKS	Profesjonalne Systemy Tras Kablowych			Nr rysunku				


Symbol
L [mm]
H [mm]
WWCT□400
410
130
WWCT□300
310
110
WWCT□200
210
90
H
33
9
25
50
13x20
3
75
20
8
9
9
L
40
40
90
9
100
100
26
20
R5
30
9
18
40
23
16,5
33
Profesjonalne Systemy Tras Kablowych
Projektował
Rysował
Sprawdził
Zatwierdził
Nazwisko
Podpis
Data
Odchyłka wymiarów nietolerowanych
Materiał
Gatunek
Nr normy
półfabrykat (nr normy)
Masa [kg]
Podziałka
1:1
Format A3
Arkusz
Arkuszy
Nr zmiany
Nazwa rysunku
WWCT□400
Nr programu maszynowego
Nr rysunku

Niskie napięcie | **Termokurczliwa**



SMH 1... E 90

$U_0/U(U_m)$ 0,6/1 (1,2) kV

Przelotowa mufa termokurczliwa niskiego napięcia do kabli NHXH E 90

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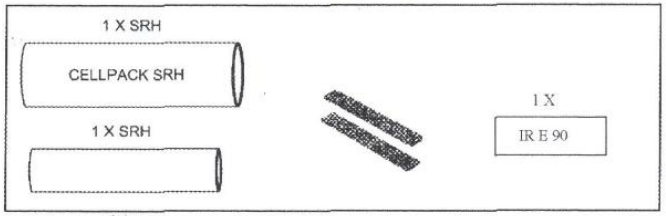
CELLPACK
Electrical Products

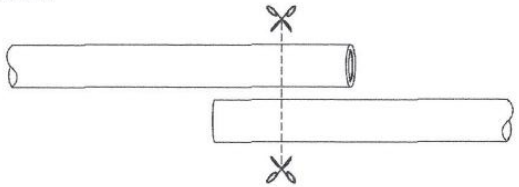
Uwagi ogólne

- Sprawdź zakres mufy i przekrój kabla.
- Sprawdź zawartość zestawu zgodnie z wykazem elementów.
- Przeczytaj instrukcję montażu.

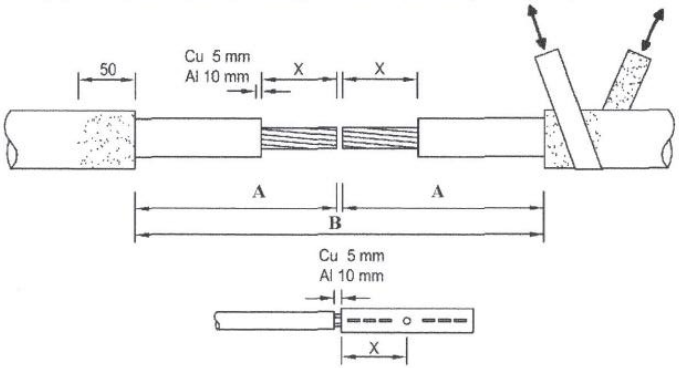
Montaż musi być wykonany przez wykwalifikowany personel.
Producent nie ponosi żadnej odpowiedzialności za awarie będące skutkiem niepoprawnego montażu.



1) Przyciąć kable.

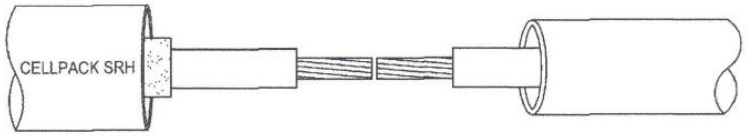


2) Usunąć powłokę zewnętrzną i izolację. Zmatowić powłokę zewnętrzną.

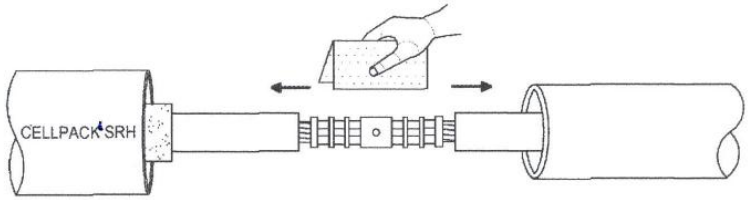


Typ zestawu	SMH 1 35-50/E90	SMH 1 70-95/E90	SMH 1 120-150/E90	SMH 1 185-240/E90
Wymiar	mm	mm	mm	mm
A	80	80	80	90
B	160	160	160	180

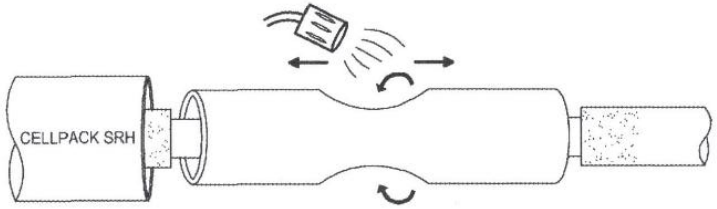
3) Nasunąć rurę izolacyjną i rurę powłokową.



4) Zaprasować złączkę i usunąć zadziory.

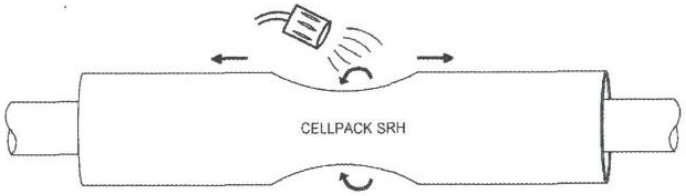


5) Nasunąć centralnie na złączkę i obkurczyć rurę izolacyjną.



6) Na zaizolowaną złączkę nasuń centralnie ceramiczny element IR E 90.

7) Nasunąć centralnie na połączenie rurę powłokową i obkurczyć.



7. FINAL PROVISION

§ 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 STN EN 1363-1, and where appropriate DIN 4102-2 and DIN 4102 - 12. Any significant deviation with respect to size, constructional details, loads, stresses, edge 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, s.r.o., Batizovce. 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, s.r.o., Batizovce.

Approved by:

Ing. Štefan Rástocký
leader of the testing laboratory

Prepared by:

Bc. Dávid Šubert
technician of the testing laboratory

8. NORMATIVE REFERENCES

STN EN 1363-1: 2001	Fire resistance tests. Part 1: General requirements
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

THE END OF THE TEST REPORT