FIRES
The Experts On Fire Safety

TEST REPORT FIRES-FR-086-11-AUNE

Cable bearing system BAKS with cables business TECHNOKABEL

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Reg. No. 041/S-159

The Experts on Fire Safety

TEST REPORT

FIRES-FR-086-11-AUNE

Tested property:	Function in fire
Test method:	DIN 4102 – 12:1998-11
Date of issue:	21. 05. 2011
Name of the product:	Cable bearing system BAKS with cables business TECHNOKABEL
Manufacturer:	BAKS Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew, Poland - producer of construction TECHNOKABEL S.A., Nasielska 55, 04-343 Warszawa, Poland – producer of cables
Sponsor:	BAKS Kazimierz Sielski, ul. Jagodne 5, 05-480 Karczew, Poland
Task No.:	PR-11-0032
Specimens received:	11. 04. 2011
Date of the test:	14. 04. 2011

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

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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. Marcin Sobolewski	BAKS Kazimierz Sielski
Mr. Mariusz Kwiatkowski	TECHNOKABEL S.A.
Mr. Pavel Stradomski	TECHNOKABEL S.A.

test directed by	Ing. Štefan Rástocký
test carried out by	Miroslav Hudák
operator	Alexander Reľovský

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 08 521 - F 08 528	Plate thermometers	temperature inside the test furnace, according to EN 1363-1
F 08 701	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 TECHNOKABEL S.A. 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 UKO2 and OZSO with accessories and power and communication halogen free cables of TECHNOKABEL S.A. company.

Cables

Used cables by test:	NHXH-J FE180 PH30/E30 4x1,5 RE	(8 x)
	NHXH-J FE180 PH30/E30 4x50 RM	(8 x)
	NHXCH FE180 PH30/E30 4x1,5/1,5 RE	(2 x)
	NHXCH FE180 PH30/E30 4x50/25 RM	(2 x)
	(N)HXH-J FE180 PH30/E30 4x1,5 RE	(4 x)
	(N)HXH-J FE180 PH30/E30 4x50 RM	(4 x)
	(N)HXCH FE180 PH30/E30 4x1,5/1,5 RE	(2 x)
	NHXH-J FE180 PH90/E90 4x1,5 RE	(17 x)
	NHXH-J FE180 PH90/E90 4x50 RM	(15 x)
	NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	(12 x)
	NHXCH FE180 PH90/E90 4x50/25 RM	(10 x)
	(N)HXH-J FE180 PH90/E90 4x1,5 RE	(9 x)
	(N)HXH-J FE180 PH90/E90 4x50 RM	(7 x)
	HDGs FE180 PH90/E30-E90 2x1,0 mm^2	(12 x)
	HTKSH FE180 PH90/E30-E90 1x2x0,8 mm	(12 x)
	HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm	(12 x)
	JE-H(St)H FE180 PH90/E30-E90 1x2x0,8 mm	(4 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 was made by three consoles (type WPCO 1000) which were fixed to ceiling by two dowels (type PSRO M10x80) in spacing of 1500 mm. Six booms (type WMCO 400) were fixed by screws (type SMM10x80-F) at each console. Holders (type UPWO F) were fixed at the end of booms with screws (type SGNM8x14-F). Booms were fixed through these holders by threaded bar (type PGM10/1x1000) with washers and nuts M10 to ceiling holder (type USOV F) which was fixed to ceiling by dowel (type PSRO M10x80).
Trays (type KCOP 400H60/3F, steel sheet thickness 1,5 mm) were fixed at upper booms and left central booms and jointed together by two junctions (type LPOPH60F) and by sheet (type BLO 400F) with screws (type SGNM6x12-F).
Ladders (type DGOP 400H60/3F, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were fixed at right central booms and under booms by clips (type ZMO F) and jointed together by junction (type LDOCH60F) with screws (type SGNM8x14 F).
Trays were loaded with 10 $kg.m^{-1}$ and ladders were loaded with 20 $kg.m^{-1}$.
All bearing systems were from steel, hot-dip galvanized to PN-EN ISO 1461:2000.

Suspension tracks No. 7 and 8
Tracks was made of three consoles combined of two horizontal supports (type CWOP40H40/05 F) and two threaded bar (type PGM10/1x1000) with washers and nuts M10 which were fixed to ceiling by dowels (type TRSO M10x40) in spacing of 1500 mm.
Mesh trays (type KDSO 400H60/3F, steel wire Ø 4,5 mm) were fixed at each horizontal supports and jointed together by five junctions (type USSO).
Mesh trays were loaded with 20 $kg.m^{-1}$.
All bearing systems were from steel, hot-dip galvanized to PN-EN ISO 1461:2000.

Suspension tracks No. 9, 10, 11 and 12
Tracks was made of three consoles combined of two horizontal supports (type CWOP40H40/1L) and three threaded bar (type PGM10/1x1000) with washers and nuts M10 which were fixed to ceiling by dowels (type TRSO M10x40) in spacing of 1500 mm.
Trays (type KCOP 400H60/3L, steel sheet thickness 1,5 mm) were fixed at upper horizontal supports and jointed together by two junctions (type LPOPH60L) and by sheet (type BLO 400L) with screws (type SGNM6x12).
Ladders (type DGOP 400H60/3L, steel sheet thickness 1,5 mm, spacing of transoms 150 mm) were fixed at central booms and left under booms by clips (type ZMO) and jointed together by junction (type LDOCH60L) 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 painted by polyurethane powder coating.

Suspension track No. 13
Track was made of three consoles (type WKSO 60 F) and threaded bar (type PGM6/1x200) with washers and nuts M6 which were fixed to ceiling by dowels (type TRSO M6x30) in spacing of 1500 mm.
Mesh trays (type KDSO 60H60 F, steel wire Ø 4,5 mm) were fixed at each console and jointed together by two junctions (type USSO).
Mesh trays were loaded with 1,5 $kg.m^{-1}$.
All bearing systems were from steel, hot-dip galvanized to PN-EN ISO 1461:2000.

Suspension track No. 14
Ceiling holders (type OZSO) were fixed to ceiling by dowels (type SRO M6x30) in spacing of 600 mm.

Suspension track No. 15
Ceiling ledges (type SDOP 500) were fixed to ceiling by dowels (type SRO M6x30) in spacing of 600 mm.
Three cables were fixed to ledges by each clip (type UKO2) in spacing of 600 mm.

Cable penetration through the wall of test furnace was sealed by mineral wool Rockwool.
Loading with steel chain and line steel weight with length 400 mm was used as the equivalent load.

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 specimens 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	23,6
standard deviation	0,3

Relative air humidity [%]

mean	46,8
standard deviation	2,2

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]
14. 04. 2011	43,7	14,0

5.3 RESULTS OF THE TEST

Measured values are stated in this test report.

6. CLOSING

Evaluation of the test:

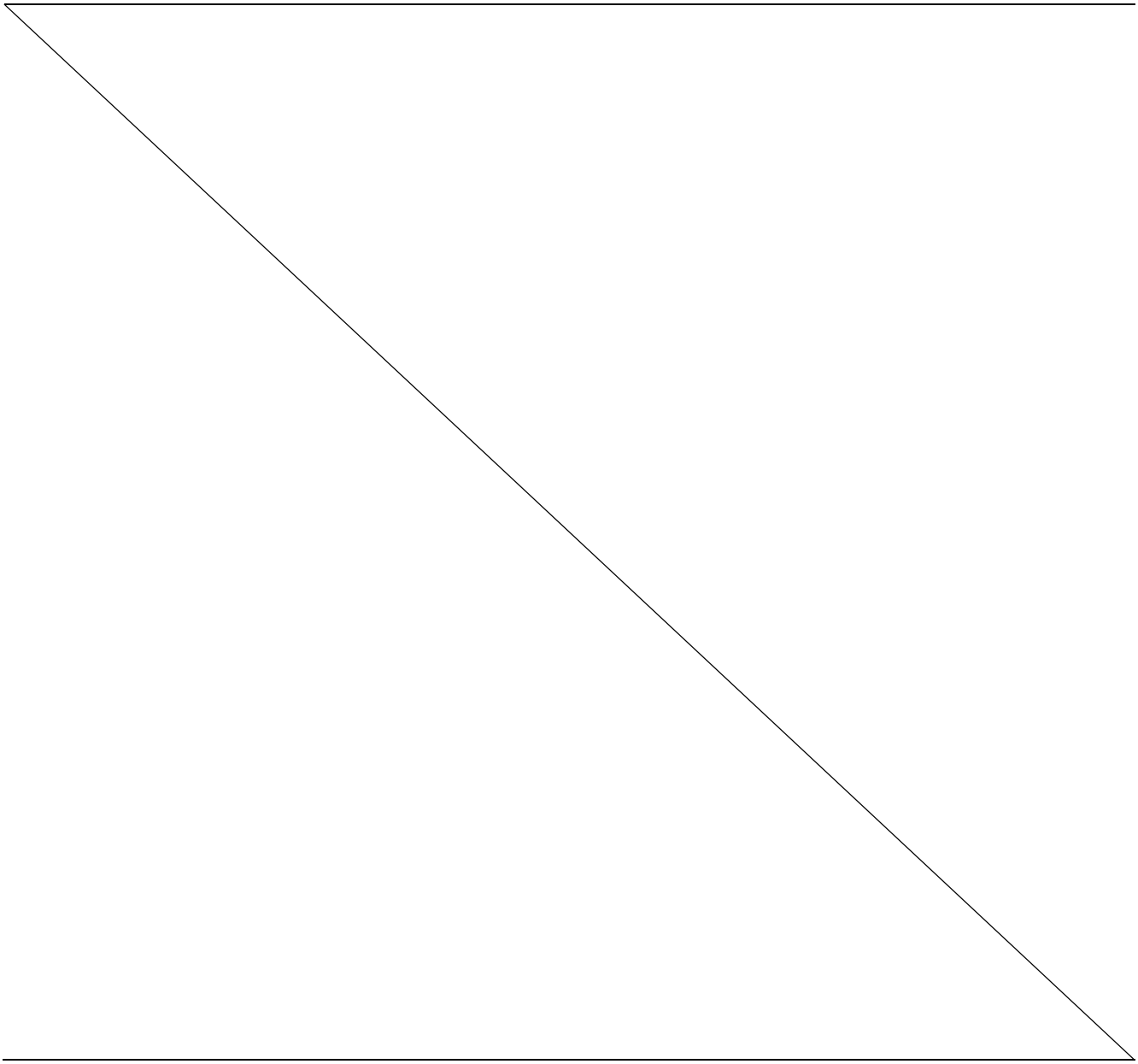
Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
1	3 cables NHXH-J FE180 PH90/E90 4x50 RM	15	90 minutes no failure / interruption
2	3 cables NHXH-J FE180 PH90/E90 4x1,5 RE	15	90 minutes no failure / interruption
3	3 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	15	90 minutes no failure / interruption
4	3 cables (N)HXH-J FE180 PH90/E90 4x50 RM	15	56 minutes
5	2 cables NHXCH FE180 PH90/E90 4x50/25 RM	12	90 minutes no failure / interruption
6	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	12	90 minutes no failure / interruption
7	2 cables NHXCH FE180 PH90/E90 4x50/25 RM	11	90 minutes no failure / interruption
8	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	11	79 minutes
9	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	10	90 minutes no failure / interruption
10	2 cables NHXH-J FE180 PH90/E90 4x50 RM	10	90 minutes no failure / interruption
11	2 cables NHXH-J FE180 PH30/E30 4x50 RM	10	76 minutes
12	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE	10	38 minutes

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
13	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	9	90 minutes no failure / interruption
14	2 cables NHXH-J FE180 PH90/E90 4x50 RM	9	90 minutes no failure / interruption
15	2 cables NHXH-J FE180 PH30/E30 4x50 RM	9	90 minutes no failure / interruption
16	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE	9	63 minutes
17	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	14	90 minutes no failure / interruption
18	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	14	90 minutes no failure / interruption
19	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	8	63 minutes
20	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM	8	24 minutes
21	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM	8	30 minutes
22	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE	8	67 minutes
23	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	7	85 minutes
24	2 cables NHXH-J FE180 PH90/E90 4x50 RM	7	90 minutes no failure / interruption
25	2 cables NHXCH FE180 PH90/E90 4x50/25 RM	7	90 minutes no failure / interruption
26	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	7	90 minutes no failure / interruption
27	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	13	79 minutes
28	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	13	90 minutes no failure / interruption
29	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	6	30 minutes
30	2 cables NHXCH FE180 PH90/E90 4x50/25 RM	6	68 minutes
31	2 cables NHXCH FE180 PH30/E30 4x1,5/1,5 RE	5	63 minutes
32	2 cables NHXCH FE180 PH30/E30 4x50/25 RM	5	63 minutes
33	2 cables NHXH-J FE180 PH90/E90 4x50 RM	5	72 minutes
34	2 cables (N)HXCH FE180 PH30/E30 4x1,5/1,5 RE	5	50 minutes
35	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE	4	90 minutes no failure / interruption
36	2 cables NHXCH FE180 PH90/E90 4x50/25 RM	4	90 minutes no failure / interruption
37	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	3	74 minutes
38	2 cables NHXH-J FE180 PH90/E90 4x50 RM	3	37 minutes
39	2 cables NHXH-J FE180 PH30/E30 4x50 RM	3	30 minutes
40	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE	3	31 minutes
41	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE	2	90 minutes no failure / interruption
42	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM	2	90 minutes no failure / interruption
43	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM	2	90 minutes no failure / interruption
44	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE	2	90 minutes no failure / interruption
45	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE	1	90 minutes no failure / interruption
46	2 cables NHXH-J FE180 PH90/E90 4x50 RM	1	90 minutes no failure / interruption
47	2 cables NHXH-J FE180 PH30/E30 4x50 RM	1	90 minutes no failure / interruption
48	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE	1	90 minutes no failure / interruption
52A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	12	62 minutes
52B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	12	90 minutes no failure / interruption
53A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm	12	90 minutes no failure / interruption
54A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm	12	90 minutes no failure / interruption
55A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm^2	11	90 minutes no failure / interruption
56A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm	11	90 minutes no failure / interruption
57A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm	11	90 minutes no failure / interruption
58A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm^2	14	90 minutes no failure / interruption
59A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm	14	90 minutes no failure / interruption
60A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm	14	90 minutes no failure / interruption
61A, B	2 cables JE-H(St)H FE180 PH90/E30-E90 1x2x0,8 mm	14	90 minutes no failure / interruption
62A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	13	90 minutes no failure / interruption
62B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	13	79 minutes
63A	cable HTKSH FE180 PH90/E30-E90 1x2x0,8 mm	13	90 minutes no failure / interruption
63B	cable HTKSH FE180 PH90/E30-E90 1x2x0,8 mm	13	84 minutes
64A, B	cable HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm	13	90 minutes no failure / interruption
65A, B	2 cables JE-H(St)H FE180 PH90/E30-E90 1x2x0,8 mm	13	90 minutes no failure / interruption
66A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	6	28 minutes

Specimen No.	Cables	Track No.	Time to first failure / interruption of conductor
66B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	6	28 minutes
67A	cable HTKSH FE180 PH90/E30-E90 1x2x0,8 mm	6	33 minutes
67B	cable HTKSH FE180 PH90/E30-E90 1x2x0,8 mm	6	48 minutes
68A	cable HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm	6	79 minutes
68B	cable HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm	6	87 minutes
69A	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	4	85 minutes
69B	cable HDGs FE180 PH90/E30-E90 2x1,0 mm^2	4	88 minutes
70A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm	4	90 minutes no failure / interruption
71A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm	4	90 minutes no failure / interruption

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

Specimens S1 – S48 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.
Specimens S52 – S71 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.
Circuit breakers with rating 3 A were used.

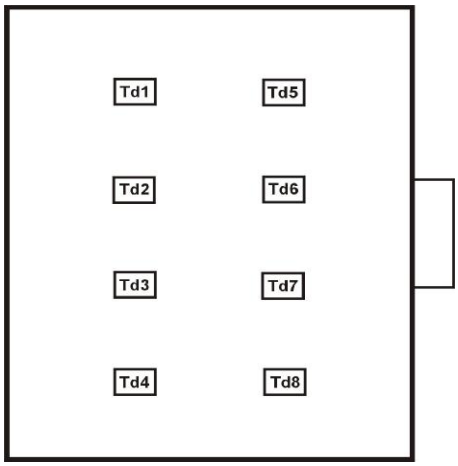


Measured values inside the test furnace

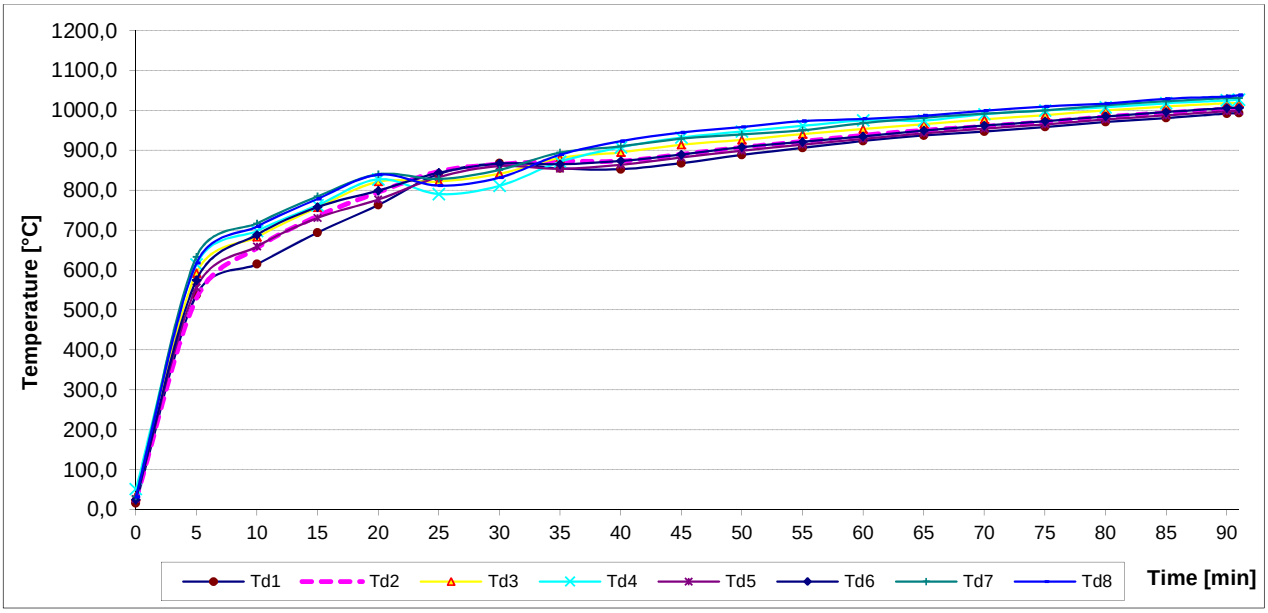
Time	Temperature [°C]											Deviation	Pressure
t [min]	Td1	Td2	Td3	Td4	Td5	Td6	Td7	Td8	Tave	Tn	To	d_e [%]	p [Pa]
0	16,6	23,6	32,6	51,8	26,5	25,0	32,8	31,5	30,1	20,0	14,4	0,0	3,2
5	537,6	529,1	592,6	614,4	556,1	574,7	633,3	617,2	581,9	576,4	14,2	-14,8	16,8
10	615,0	655,6	682,9	698,2	659,2	688,5	717,3	709,1	678,2	678,4	13,7	-5,4	16,9
15	694,0	735,4	757,0	762,6	731,0	758,1	784,9	778,6	750,2	738,6	12,9	-3,0	18,3
20	763,0	795,0	821,3	827,6	776,8	799,2	840,1	839,0	807,8	781,4	12,9	-1,3	17,8
25	840,9	847,4	821,9	790,7	833,0	844,1	828,5	811,6	827,3	814,6	13,0	-0,3	17,6
30	867,7	865,4	841,5	811,3	860,6	866,8	851,2	831,8	849,5	841,8	12,8	0,0	15,4
35	854,7	873,0	880,8	871,4	854,1	865,4	894,4	889,1	872,9	864,8	12,6	0,1	16,4
40	852,9	873,2	894,9	907,5	864,1	873,5	910,0	922,9	887,4	884,7	12,6	0,2	16,3
45	868,0	890,2	914,2	932,3	882,3	889,6	929,2	944,5	906,3	902,3	12,7	0,2	17,3
50	888,8	907,6	926,2	947,0	899,0	907,9	940,0	958,3	921,9	918,1	12,9	0,2	17,7
55	906,1	922,5	940,8	961,4	914,5	921,3	950,3	973,2	936,3	932,3	12,9	0,2	17,3
60	923,6	937,9	953,6	975,0	928,4	935,2	968,3	978,8	950,1	945,3	12,9	0,3	16,4
65	937,4	950,3	965,9	974,7	942,6	949,8	981,8	986,5	961,1	957,3	12,7	0,3	16,0
70	947,5	960,4	977,6	990,7	954,2	962,3	991,8	999,4	973,0	968,4	12,9	0,3	16,1
75	958,5	971,3	988,4	1000,0	965,2	972,9	1000,0	1010,0	983,3	978,7	12,9	0,3	15,9
80	970,9	984,0	1000,0	1008,0	977,4	985,2	1013,0	1017,0	994,4	988,4	12,7	0,3	15,8
85	981,2	994,0	1010,0	1018,0	987,9	996,1	1023,0	1029,0	1004,9	997,4	12,7	0,4	15,1
90	992,2	1003,0	1018,0	1025,0	997,8	1006,0	1031,0	1035,0	1013,5	1005,9	12,8	0,4	16,0
91	993,4	1004,0	1018,0	1027,0	998,5	1006,0	1031,0	1038,0	1014,5	1007,6	12,7	0,4	14,8
92	996,4	1008,0	1019,0	1025,0	1000,0	1009,0	1033,0	1039,0	1016,2	1009,2	12,9	0,4	15,0

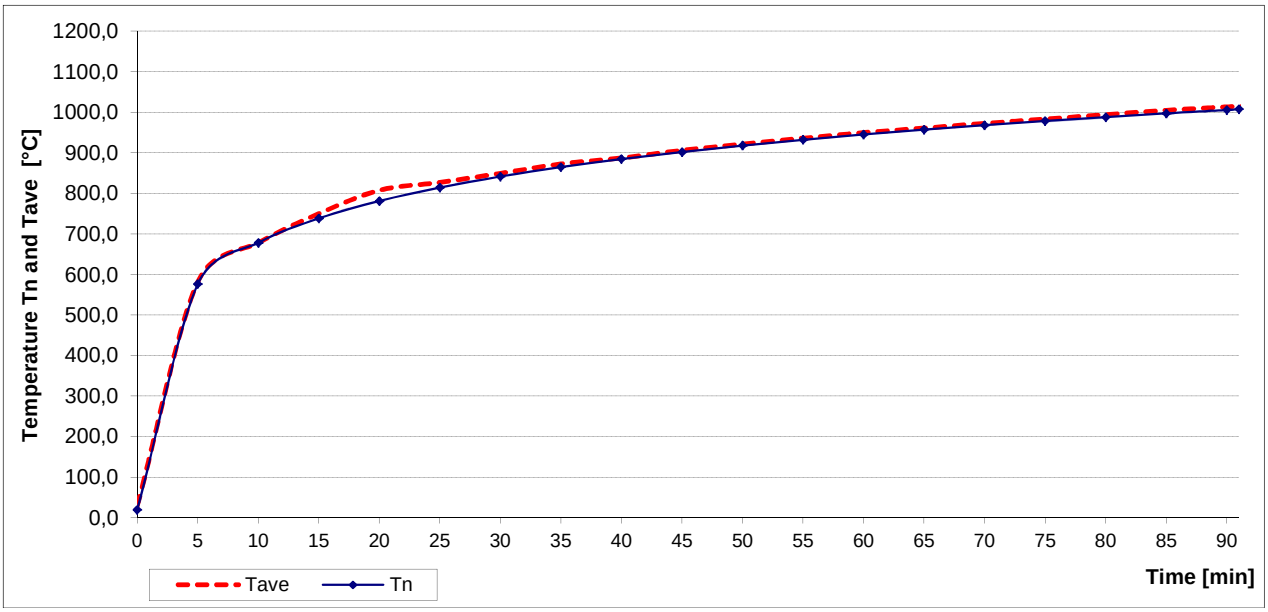
Tave Average temperature in the test furnace calculated from plate thermometers
Tn Standard temperature in the test furnace laid down to test guideline
To Ambient temperature
d_e Deviation of the average temperature from the standard temperature calculated according to test guideline
p Pressure inside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

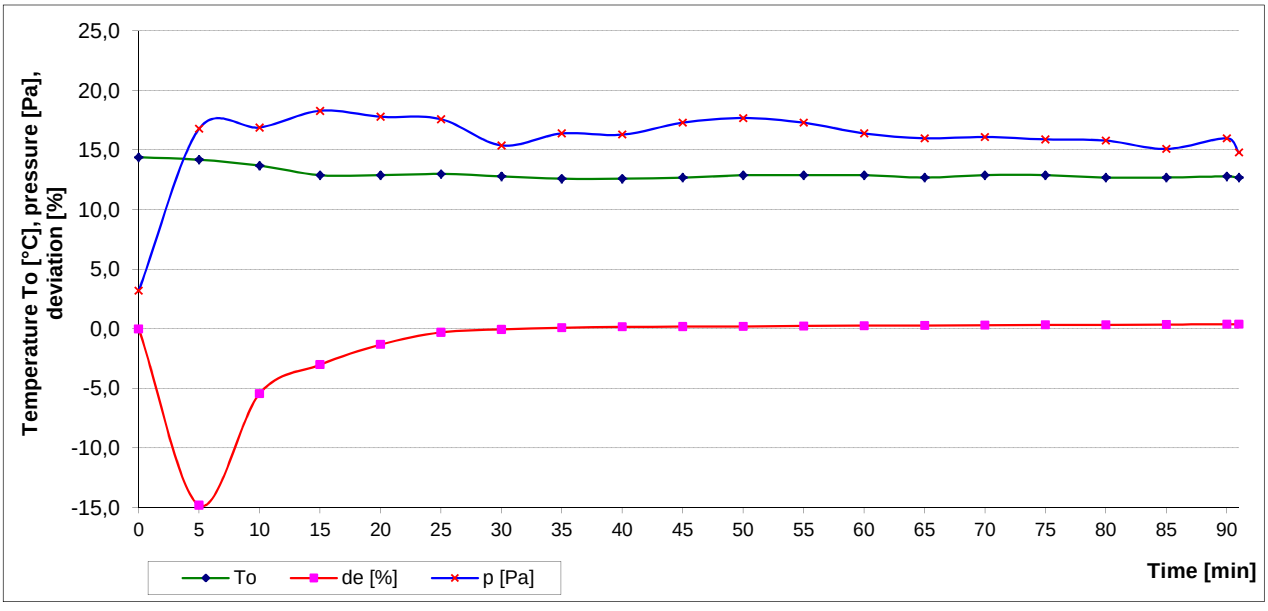
Layout of measuring points inside the test furnace:



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	no failure / interruption
	2-L2	no failure / interruption
	3-L3	no failure / interruption
	4-PEN	no failure / interruption
S2	5-L1	no failure / interruption
	6-L2	no failure / interruption
	7-L3	no failure / interruption
	8-PEN	no failure / interruption
S3	9-L1	no failure / interruption
	10-L2	no failure / interruption
	11-L3	no failure / interruption
	12-PEN	no failure / interruption
S4	13-L1	56:11
	14-L2	x
	15-L3	x
	16-PEN	x
S5	17-L1	no failure / interruption
	18-L2	no failure / interruption
	19-L3	no failure / interruption
	20-PEN	no failure / interruption
S6	21-L1	no failure / interruption
	22-L2	no failure / interruption
	23-L3	no failure / interruption
	24-PEN	no failure / interruption
S7	25-L1	no failure / interruption
	26-L2	no failure / interruption
	27-L3	no failure / interruption
	28-PEN	no failure / interruption
S8	29-L1	x
	30-L2	79:10
	31-L3	x
	32-PEN	x
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	3 cables NHXH-J FE180 PH90/E90 4x50 RM
2	3 cables NHXH-J FE180 PH90/E90 4x1,5 RE
3	3 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE
4	3 cables (N)HXH-J FE180 PH90/E90 4x50 RM
5	2 cables NHXCH FE180 PH90/E90 4x50/25 RM
6	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE
7	2 cables NHXCH FE180 PH90/E90 4x50/25 RM
8	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE
9	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
10	2 cables NHXH-J FE180 PH90/E90 4x50 RM

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	x
	42-L2	76:22
	43-L3	x
	44-PEN	x
S12	45-L1	38:11
	46-L2	x
	47-L3	x
	48-PEN	x
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	x
	62-L2	63:40
	63-L3	x
	64-PEN	x
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	x
	74-L2	63:40
	75-L3	x
	76-PEN	x
S20	77-L1	x
	78-L2	24:09
	79-L3	x
	80-PEN	x

Specimen No.	Cables
11	2 cables NHXH-J FE180 PH30/E30 4x50 RM
12	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE
13	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
14	2 cables NHXH-J FE180 PH90/E90 4x50 RM
15	2 cables NHXH-J FE180 PH30/E30 4x50 RM
16	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE
17	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
18	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE
19	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE
20	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM

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	30:05
	84-PEN	x
S22	85-L1	67:16
	86-L2	x
	87-L3	x
	88-PEN	x
S23	89-L1	x
	90-L2	85:36
	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	79:15
	106-L2	x
	107-L3	x
	108-PEN	x
S28	109-L1	no failure / interruption
	110-L2	no failure / interruption
	111-L3	no failure / interruption
	112-PEN	no failure / interruption
S29	113-L1	x
	114-L2	x
	115-L3	30:29
	116-PEN	x
S30	117-L1	68:25
	118-L2	x
	119-L3	x
	120-PEN	x

Specimen No.	Cables
21	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM
22	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE
23	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
24	2 cables NHXH-J FE180 PH90/E90 4x50 RM
25	2 cables NHXCH FE180 PH90/E90 4x50/25 RM
26	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE
27	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
28	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE
29	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE
30	2 cables NHXCH FE180 PH90/E90 4x50/25 RM

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	x
	122-L2	63:55
	123-L3	x
	124-PEN	x
S32	125-L1	63:58
	126-L2	x
	127-L3	x
	128-PEN	x
S33	129-L1	x
	130-L2	x
	131-L3	72:47
	132-PEN	x
S34	133-L1	x
	134-L2	x
	135-L3	50:23
	136-PEN	x
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	74:08
	146-L2	x
	147-L3	x
	148-PEN	x
S38	149-L1	x
	150-L2	37:54
	151-L3	x
	152-PEN	x
S39	153-L1	30:31
	154-L2	x
	155-L3	x
	156-PEN	x
S40	157-L1	31:53
	158-L2	x
	159-L3	x
	160-PEN	x

Specimen No.	Cables
31	2 cables NHXCH FE180 PH30/E30 4x1,5/1,5 RE
32	2 cables NHXCH FE180 PH30/E30 4x50/25 RM
33	2 cables NHXH-J FE180 PH90/E90 4x50 RM
34	2 cables (N)HXCH FE180 PH30/E30 4x1,5/1,5 RE
35	2 cables NHXCH FE180 PH90/E90 4x1,5 /1,5 RE
36	2 cables NHXCH FE180 PH90/E90 4x50/25 RM
37	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
38	2 cables NHXH-J FE180 PH90/E90 4x50 RM
39	2 cables NHXH-J FE180 PH30/E30 4x50 RM
40	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE

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 S41 to S48 - power cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S41	161-L1	no failure / interruption
	162-L2	no failure / interruption
	163-L3	no failure / interruption
	164-PEN	no failure / interruption
S42	165-L1	no failure / interruption
	166-L2	no failure / interruption
	167-L3	no failure / interruption
	168-PEN	no failure / interruption
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

Specimen No.	Cables
41	2 cables (N)HXH-J FE180 PH90/E90 4x1,5 RE
42	2 cables (N)HXH-J FE180 PH90/E90 4x50 RM
43	2 cables (N)HXH-J FE180 PH30/E30 4x50 RM
44	2 cables (N)HXH-J FE180 PH30/E30 4x1,5 RE
45	2 cables NHXH-J FE180 PH90/E90 4x1,5 RE
46	2 cables NHXH-J FE180 PH90/E90 4x50 RM
47	2 cables NHXH-J FE180 PH30/E30 4x50 RM
48	2 cables NHXH-J FE180 PH30/E30 4x1,5 RE

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	62:10
	210-PEN	x
S52B	211-L	no failure / interruption
	212-PEN	no failure / interruption
S53A	213-L	no failure / interruption
	214-PEN	no failure / interruption
S53B	215-L	no failure / interruption
	216-PEN	no failure / interruption
S54A	217-L	no failure / interruption
	218-PEN	no failure / interruption
S54B	219-L	no failure / interruption
	220-PEN	no failure / interruption
S55A	221-L	no failure / interruption
	222-PEN	no failure / interruption
S55B	223-L	no failure / interruption
	224-PEN	no failure / interruption
S56A	225-L	no failure / interruption
	226-PEN	no failure / interruption
S56B	227-L	no failure / interruption
	228-PEN	no failure / interruption
S57A	229-L	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
S60A	241-L	no failure / interruption
	242-PEN	no failure / interruption
S60B	243-L	no failure / interruption
	244-PEN	no failure / interruption
S61A	245-L	no failure / interruption
	246-PEN	no failure / interruption
S61B	247-L	no failure / interruption
	248-PEN	no failure / interruption

Specimen No.	Cables
52A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm^2
53A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm
54A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm
55A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm^2
56A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm
57A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm
58A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm^2
59A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm
60A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm
61A, B	2 cables JE-H(St)H FE180 PH90/E30-E90 1x2x0,8 mm

x Conductor was turned off manually after permanent interruption / failure of other conductors in the cable
Signal cables were tested by three-phase voltage supply 1 x 110V with LED diods 3V / 0,03W.
Circuit breakers with rating 3 A were used.

Measured time of tested specimens from S62 to S71 - communication cables

Specimen	Bulbs	Time to permanent failure / interruption [min:s]
S62A	249-L	no failure / interruption
	250-PEN	no failure / interruption
S62B	251-L	79:56
	252-PEN	x
S63A	253-L	no failure / interruption
	254-PEN	no failure / interruption
S63B	255-L	84:38
	256-PEN	x
S64A	257-L	no failure / interruption
	258-PEN	no failure / interruption
S64B	259-L	no failure / interruption
	260-PEN	no failure / interruption
S65A	261-L	no failure / interruption
	262-PEN	no failure / interruption
S65B	263-L	no failure / interruption
	264-PEN	no failure / interruption
S66A	265-L	28:52
	266-PEN	x
S66B	267-L	28:10
	268-PEN	x
S67A	269-L	33:53
	270-PEN	x
S67B	271-L	48:08
	272-PEN	x
S68A	273-L	79:25
	274-PEN	x
S68B	275-L	87:53
	276-PEN	x
S69A	277-L	85:23
	278-PEN	x
S69B	279-L	88:17
	280-PEN	x
S70A	281-L	no failure / interruption
	282-PEN	no failure / interruption
S70B	283-L	no failure / interruption
	284-PEN	no failure / interruption
S71A	285-L	no failure / interruption
	286-PEN	no failure / interruption
S71B	287-L	no failure / interruption
	288-PEN	no failure / interruption

Specimen No.	Cables
62A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm^2
63A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm
64A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm
65A, B	2 cables JE-H(St)H FE180 PH90/E30-E90 1x2x0,8 mm
66A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm^2
67A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm
68A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm
69A, B	2 cables HDGs FE180 PH90/E30-E90 2x1,0 mm^2
70A, B	2 cables HTKSH FE180 PH90/E30-E90 1x2x0,8 mm
71A, B	2 cables HTKSHekw FE180 PH90/E30-E90 1x2x0,8 mm

x Conductor was turned off manually after permanent interruption / failure of other conductors in the cable
Signal cables were tested by three-phase voltage supply 1 x 110V with LED diods 3V / 0,03W.
Circuit breakers with rating 3 A were used.

PHOTOS

Photo taken before the test.

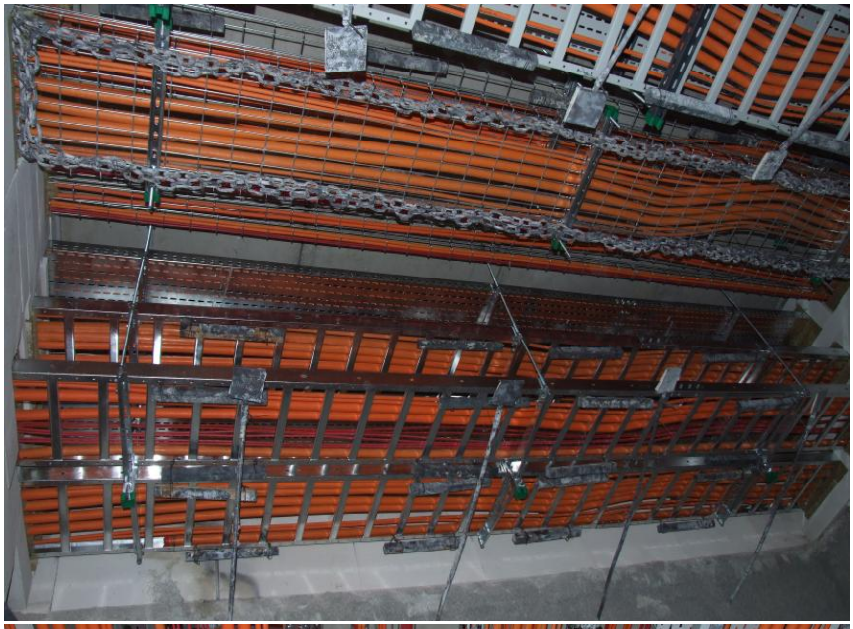


Photo taken before the test.

Photo taken before the test.

PHOTOS

Photo taken before the test.

Photo taken before the test.

Photo taken before the test.

PHOTOS

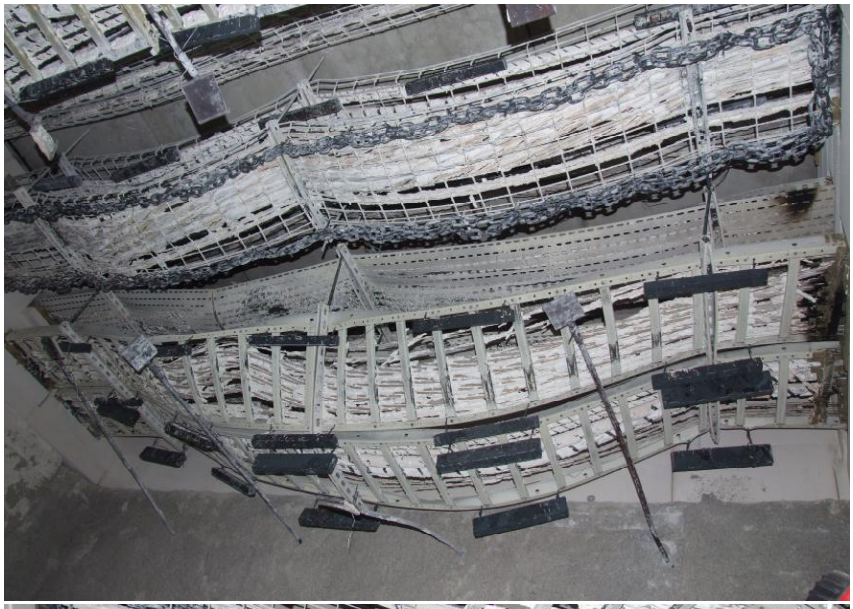


Photo taken after the test.

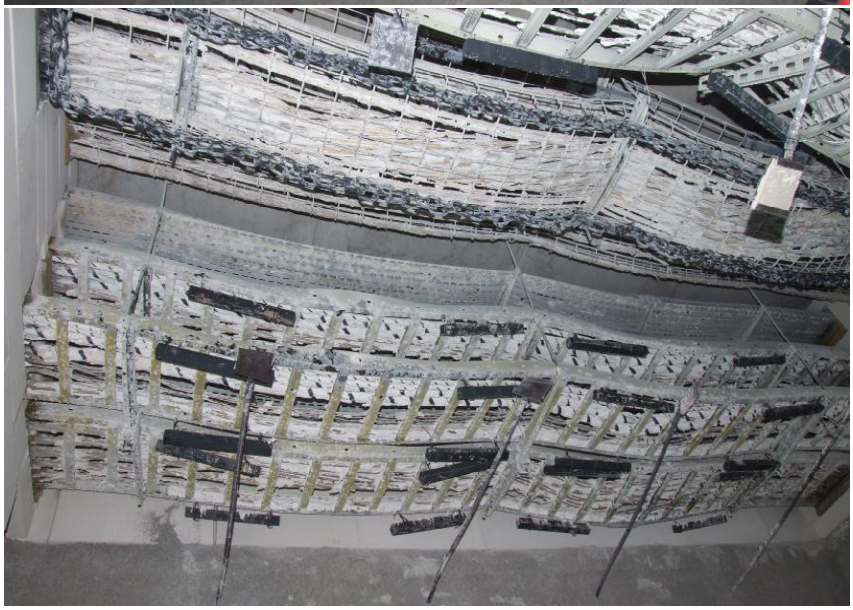


Photo taken after the test.

Photo taken after the test.

PHOTOS

Photo taken after the test.

Photo taken after the test.

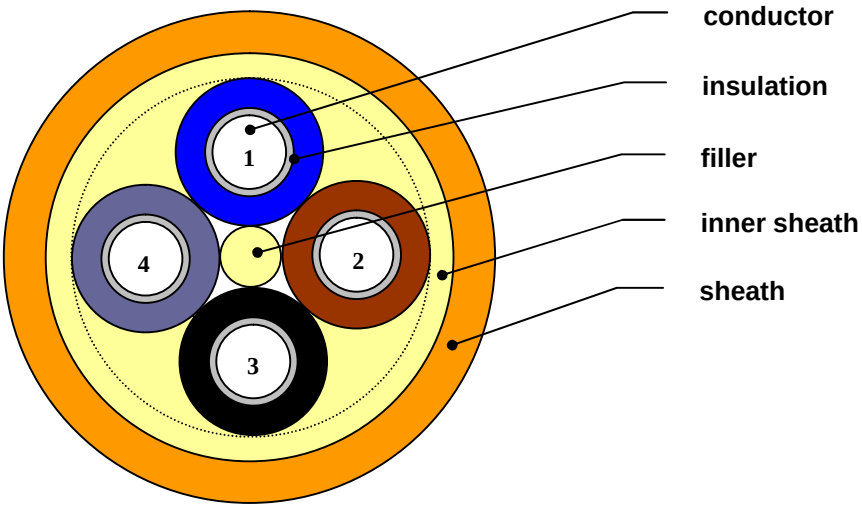
Photo taken after the test.

TECHNOKABEL®

ISO 9001:2008

NHXH FE180 PH30/E30 0,6/1 kV, NHXH-J FE180 PH30/E30 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

NHXH FE180 PH30/E30 0,6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

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

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

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

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

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

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K199A042011

NHXH FE180 PH30/E30 0,6/1 kV, NHXH-J FE180 PH30/E30 0,6/1 kV

CHARACTERISTICS

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

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

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius	single core cables -15 x cable diameter multi core cables -12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 60332-3-24, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

*Circuit integrity is dependent on installation method.

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

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm²	mm	kg/km	kg/km
	1 x 6 RE	8,1	58	118
	1 x 10 RE	8,9	96	163
	1 x 16 RE	9,8	154	225
	1 x 25 RM	11,8	240	335
	1 x 35 RM	12,8	336	435
	1 x 50 RM	14,2	480	560
	1 x 70 RM	16	672	770
	1 x 95 RM	17,7	912	1020
	1 x 120 RM	19,4	1152	1260
	1 x 150 RM	21,1	1440	1560
	1 x 185 RM	23,2	1776	1950
	1 x 240 RM	25,7	2304	2510
	1 x 300 RM	28,3	2880	3050
	1 x 400 RM	31,6	3840	4140
	2 x 1,5 RE	11,3	29	178
	2 x 2,5 RE	12,1	48	220
	2 x 4 RE	13,1	77	270
	2 x 6 RE	14	115	330
	2 x 10 RE	15,6	192	445
	2 x 16 RE	17,5	307	610
	2 x 25 RM	21,9	480	950
	3 x 1,5 RE	11,8	43	205
	3 x 2,5 RE	12,7	72	255
	3 x 4 RE	13,7	115	315
	3 x 6 RE	14,7	173	395
	3 x 10 RE	16,5	288	550
	3 x 16 RM	18,6	461	775
	3 x 25 RM	23,1	720	1200
	3 x 35 RM	25,3	1008	1540
	3 x 50 RM	28,9	1440	2050
	3 x 70 RM	33,4	2016	2840
	3 x 95 RM	37,4	2736	3800
	3 x120 RM	41,3	3456	4650

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm²	mm	kg/km	kg/km
	4 x 1,5 RE	12,6	58	235
	4 x 2,5 RE	13,6	96	295
	4 x 4 RE	14,7	154	375
	4 x 6 RE	15,9	230	475
	4 x 10 RE	17,8	384	670
	4 x 16 RM	20,4	614	965
	4 x 25 RM	25,3	960	1480
	4 x 35 RM	28,3	1344	1960
	4 x 50 RM	32,3	1920	2600
	4 x 70 RM	36,8	2688	3600
	4 x 95 RM	41,3	3648	4750
	5 x 1,5 RE	13,5	72	270
	5 x 2,5 RE	14,7	120	340
	5 x 4 RE	15,9	192	435
	5 x 6 RE	17,2	288	555
	5 x 10 RE	19,6	480	800
	5 x 16 RM	22,2	768	1150
	5 x 25 RM	28,2	1200	1810
	5 x 35 RM	30,9	1680	2340
	5 x 50 RM	35,5	2400	3150
	5 x 70 RM	40,8	3360	4350
	5 x 95 RM	46,8	4560	5900
	7 x 1,5 RE	14,5	101	320
	7 x 2,5 RE	15,7	168	415
	7 x 4,0 RE	17,1	269	540
	12 x 1,5 RE	18,3	173	490
	12 x 2,5 RE	20	288	640
	19 x 1,5 RE	21,2	274	685
	19 x 2,5 RE	23,3	456	905
	24 x 1,5 RE	24,3	346	845
	24 x 2,5 RE	27,2	576	1150
	30 x 1,5 RE	26	432	1010
	30 x 2,5 RE	28,9	720	1370

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

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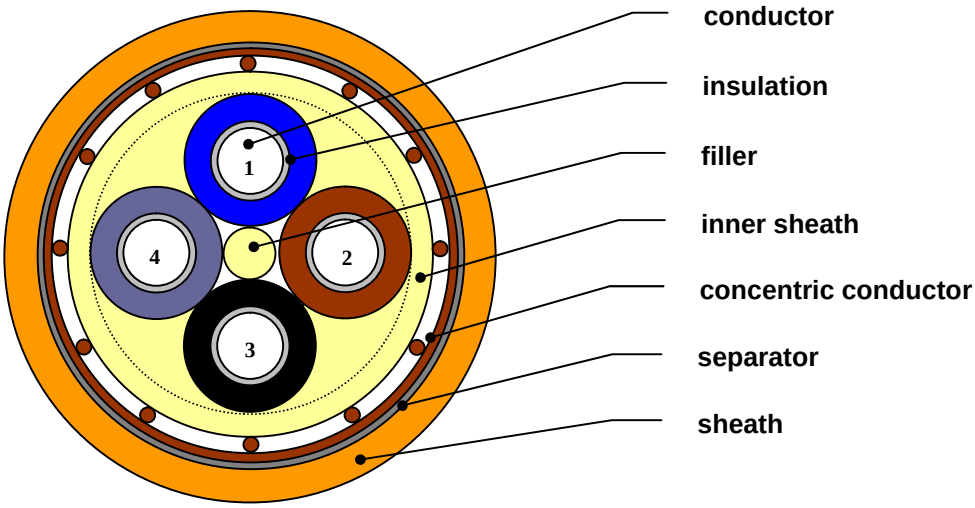
NHXCH FE180 PH30/E30 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

NHXCH FE180 PH30/E30 0,6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

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

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

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

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

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

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NHXCH FE180 PH30/E30 0,6/1 kV

CHARACTERISTICS

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

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

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius	15 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 60332-3-24, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

*Circuit integrity is dependent on installation method.

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

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm²	mm	kg/km	kg/km
	2 x 1,5 RE/1,5	13,1	52	235
	2 x 2,5 RE/2,5	14,1	80	285
	2 x 4 RE/ 4	15,4	123	355
	2 x 6 RE/ 6	16,3	182	425
	2 x 10 RE/ 10	18,6	312	595
	2 x 16 RE/ 16	20,5	489	795
	2 x 25 RM/ 16	24,5	661	1140
	2 x 35 RM/ 16	26,5	853	1410
	2 x 50 RM/ 25	29,5	1243	1820
	2 x 70 RM/ 35	33,8	1737	2600
	2 x 95 RM/ 50	38,8	2386	3750
	2 x 120 RM/ 70	42,4	3090	4600
	3 x 1,5 RE/ 1,5	13,6	66	265
	3 x 2,5 RE/ 2,5	14,7	104	320
	3 x 4 RE/4	16,0	161	410
	3 x 6 RE/ 6	17,0	240	495
	3 x 10 RE/ 10	19,4	408	710
	3 x 16 RE/ 16	21,5	643	965
	3 x 25 RM/ 16	25,8	902	1390
	3 x 35 RM /16	27,8	1190	1750
	3 x 50 RM/ 25	31,4	1723	2300
	3 x 70 RM/ 35	36,4	2410	3250
	3 x 95 RM/ 50	40,4	3296	4250
	3 x 120 RM/ 70	45,1	4236	5350

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm²	mm	kg/km	kg/km
	4 x 1,5 RE/ 1,5	14,4	81	290
	4 x 2,5 RE/ 2,5	15,6	128	370
	4 x 4 RE/ 4	17,0	200	475
	4 x 6 RE/ 6	18,2	297	580
	4 x 10 RE/ 10	20,8	504	845
	4 x 16 RE/ 16	23,1	796	1160
	4 x 25 RM/ 16	27,8	1142	1690
	4 x 35 RM/ 16	30,4	1526	2160
	4 x 50 RM/ 25	34,7	2203	2880
	4 x 70 RM/ 35	39,8	3082	4000
	4 x 95 RM/ 50	44,3	4208	5260
	4 x 120 RM/ 70	50,0	5388	6800
	7 x 1,5 RE/ 2,5	16,3	133	395
	7 x 2,5 RE/ 2,5	17,7	200	500
	12 x 1,5 RE/ 2,5	20,4	205	600
	12 x 2,5 RE/ 4	21,8	334	740
	24 x 1,5 RE/ 6	26,3	413	990
	24 x 2,5 RE/ 10	29,0	696	1300
	30 x 1,5 RE/ 6	27,2	499	1110
	30 x 2,5 RE/ 10	30,4	840	1510

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

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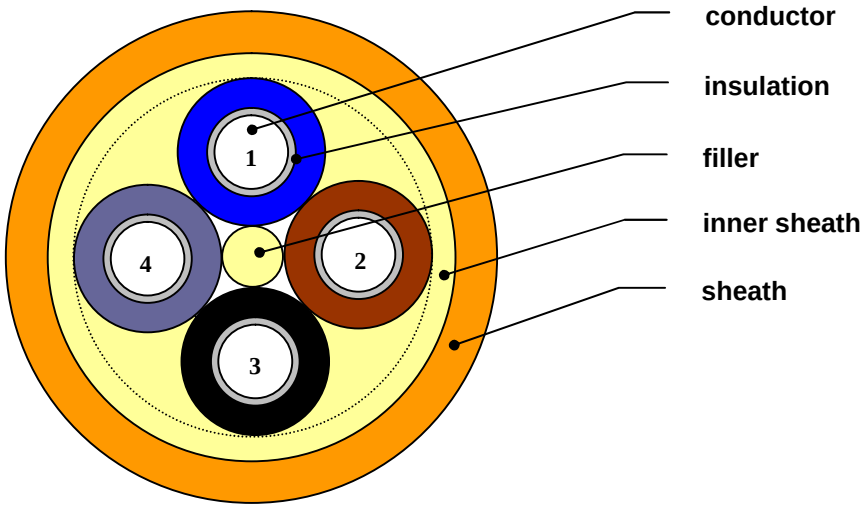
(N)HXH FE180 PH30/E30 0.6/1 kV; (N)HXH-J FE180 PH30/E30 0.6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

(N)HXH FE180 PH30/E30 0.6/1 kV and (N)HXH-J FE180 PH30/E30 0.6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

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

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

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

conductor – bare copper, solid or stranded, according to PN-EN 60228, EN 60228

insulation – double insulation ,cross-linked silicone rubber - colours in accordance with PN-HD 308,

filler – filler made of halogen free compound,

inner sheath – inner sheath made of halogen free compound,

sheath – orange, cable sheath made of halogen free compound according to HD 604 S1 and VDE 0276-604 –HM4, (oxygen index bigger than 35%).

(N)HXH FE180 PH30/E30 0.6/1 kV; (N)HXH-J FE180 PH30/E30 0.6/1 kV

CHARACTERISTICS

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

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

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

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius:	single core cables -15 x cable diameter multi core cables -12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24, PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266; PN-HD 604 S1

*Circuit integrity is dependent on installation method.

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

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

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

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

Other cross-sections and conductor counts available on request.

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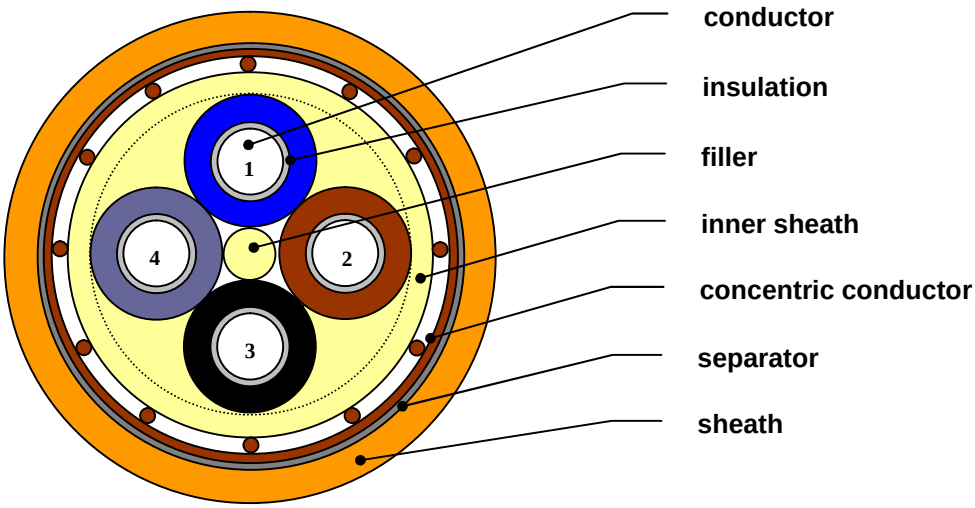
(N)HXCH FE180 PH30/E30 0.6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

(N)HXCH FE180 PH30/E30 0.6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

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

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

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

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

(N)HXCH FE180 PH30/E30 0.6/1 kV

CHARACTERISTICS

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

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

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

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius	15 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E30	DIN 4102-12
PH30	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266; PN-HD 604 S1

*Circuit integrity is dependent on installation method.

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

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

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

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

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NHXH FE180 PH90/E90 0,6/1 kV, NHXH-J FE180 PH90/E90 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES

APPLICATIONS

NHXH FE180 PH90/E90 0.6/1 kV and NHXH-J FE180 PH90/E90 0.6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

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

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

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

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

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

NHXH FE180 PH90/E90 0,6/1 kV, NHXH-J FE180 PH90/E90 0,6/1 kV

CHARACTERISTICS

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

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

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius:	single core cables -15 x cable diameter multi core cables -12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 60332-24, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

* Circuit integrity is dependent on installation method.

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

Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)	Fire load
mm²	mm	kg/km	kg/km	kWh/m
1 x 6 RE	8,5	58	122	0,30
1 x 10 RE	9,3	96	167	0,34
1 x 16 RE	10,2	154	230	0,36
1 x 25 RM	12,2	240	340	0,47
1 x 35 RM	13,2	336	440	0,49
1 x 50 RM	14,5	480	565	0,49
1 x 70 RM	16,4	672	775	0,54
1 x 95 RM	18,1	912	1030	0,56
1 x 120 RM	19,8	1152	1270	0,58
1 x 150 RM	21,5	1440	1570	0,61
1 x 185 RM	23,6	1776	1960	0,82
1 x 240 RM	26,1	2304	2520	0,97
1 x 300 RM	28,7	2880	3100	1,04
1 x 400 RM	32	3840	4170	1,47
2 x 1,5 RE	12	28,8	197	0,79
2 x 2,5 RE	12,8	48	235	0,88
2 x 4 RE	13,7	77	285	0,98
2 x 6 RE	14,7	115	350	1,11
2 x 10 RE	16,3	192	465	1,29
2 x 16 RE	18,3	307	640	1,57
2 x 25 RM	22,5	480	975	2,34
3 x 1,5 RE	12,6	43,2	225	0,86
3 x 2,5 RE	13,4	72	270	0,94
3 x 4 RE	14,4	115	335	1,04
3 x 6 RE	15,5	173	415	1,14
3 x 10 RE	17,2	288	570	1,33
3 x 16 RM	19,3	461	800	1,60
3 x 25 RM	23,8	720	1230	2,41
3 x 35 RM	26,4	1008	1600	2,80
3 x 50 RM	29,4	1440	2070	2,98
3 x 70 RM	34,3	2016	2900	4,18
3 x 95 RM	38,2	2736	3850	5,26
3 x120 RM	42,0	3456	4750	5,66
4 x 1,5 RE	13,5	58	260	0,95

Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)	Fire load
mm²	mm	kg/km	kg/km	kWh/m
4 x 2,5 RE	14,4	96	315	1,03
4 x 4 RE	15,5	154	395	1,14
4 x 6 RE	16,7	230	495	1,25
4 x 10 RE	18,8	384	700	1,49
4 x 16 RM	21,2	614	990	1,78
4 x 25 RM	26,5	960	1540	2,74
4 x 35 RM	29,1	1344	1990	3,05
4 x 50 RM	32,8	1920	2620	3,31
4 x 70 RM	37,8	2688	3650	4,55
4 x 95 RM	42,1	3648	4800	5,44
5 x 1,5 RE	14,5	72	295	1,05
5 x 2,5 RE	15,5	120	360	1,33
5 x 4 RE	16,8	192	460	1,27
5 x 6 RE	18,3	288	590	1,43
5 x 10 RE	20,7	480	835	1,68
5 x 16 RM	23,1	768	1180	1,95
5 x 25 RM	29,1	1200	1840	3,02
5 x 35 RM	32,4	1680	2430	3,54
5 x 50 RM	36,1	2400	3200	3,78
5 x 70 RM	41,7	3360	4400	4,92
5 x 95 RM	47,7	4560	5950	6,57
7 x 1,5 RE	15,6	101	350	1,18
7 x 2,5 RE	16,7	168	440	1,29
7 x 4,0 RE	18,3	269	580	1,45
12 x 1,5 RE	19,8	173	535	1,71
12 x 2,5 RE	21,6	288	690	1,90
14 x 1,5 RE	20,9	202	655	1,79
19 x 1,5 RE	23,0	274	740	2,20
19 x 2,5 RE	24,9	456	960	2,38
24 x 1,5 RE	26,9	346	945	2,83
24 x 2,5 RE	29,4	576	1230	3,09
30 x 1,5 RE	28,6	432	1110	3,20
30 x 2,5 RE	31,2	720	1460	3,50

Other cross-sections and conductor counts available on request.

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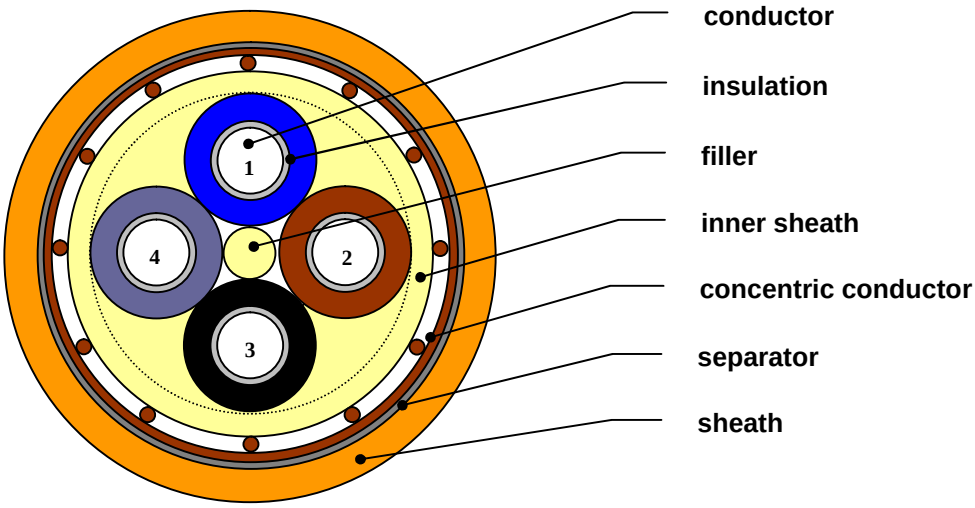
NHXCH FE180 PH90/E90 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

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

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

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

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

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

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

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NHXCH FE180 PH90/E90 0,6/1 kV

CHARACTERISTICS

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

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

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius	15 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 60332-3-24, IEC 60332-3-24, PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

*Circuit integrity is dependent on installation method.

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

Numer wyrobu	Liczba żył x przekrój żył	Średnica zewnętrzna (około)	Indeks miedziowy	Masa kabla (około)
	mm²	mm	kg/km	kg/km
	2 x 1,5 RE/1,5	13,7	52	255
	2 x 2,5 RE/2,5	14,7	80	300
	2 x 4 RE/ 4	16,0	123	375
	2 x 6 RE/ 6	17,0	182	440
	2 x 10 RE/ 10	19,2	312	620
	2 x 16 RE/ 16	21,2	489	820
	2 x 25 RM/ 16	25,0	661	1160
	2 x 35 RM/ 16	27,0	853	1430
	2 x 50 RM/ 25	30,0	1243	1840
	2 x 70 RM/ 35	35,1	1737	2730
	2 x 95 RM/ 50	39,5	2386	3800
	2 x 120 RM/ 70	43,1	3090	4700
	3 x 1,5 RE/ 1,5	14,3	66	280
	3 x 2,5 RE/ 2,5	15,3	104	340
	3 x 4 RE/4	16,7	161	425
	3 x 6 RE/ 6	17,8	240	515
	3 x 10 RE/ 10	20,1	408	730
	3 x 16 RE/ 16	22,2	643	985
	3 x 25 RM/ 16	26,4	902	1420
	3 x 35 RM /16	28,7	1190	1790
	3 x 50 RM/ 25	31,9	1723	2310
	3 x 70 RM/ 35	37,3	2410	3300
	3 x 95 RM/ 50	39,5	3296	4550
	3 x 120 RM/ 70	45,8	4236	5450

Numer wyrobu	Liczba żył x przekrój żył	Średnica zewnętrzna (około)	Indeks miedziowy	Masa kabla (około)
	mm²	mm	kg/km	kg/km
	4 x 1,5 RE/ 1,5	15,2	81	320
	4 x 2,5 RE/ 2,5	16,4	128	390
	4 x 4 RE/ 4	17,8	200	495
	4 x 6 RE/ 6	19,0	297	625
	4 x 10 RE/ 10	21,6	504	890
	4 x 16 RE/ 16	23,9	796	1190
	4 x 25 RM/ 16	28,8	1142	1740
	4 x 35 RM/ 16	31,4	1526	2220
	4 x 50 RM/ 25	35,3	2203	2920
	4 x 70 RM/ 35	40,8	3082	4100
	4 x 95 RM/ 50	45,9	4208	5650
	4 x 120 RM/ 70	50,8	5388	6900
	7 x 1,5 RE/ 2,5	17,3	133	420
	7 x 2,5 RE/ 2,5	18,6	200	520
	12 x 1,5 RE/ 2,5	21,4	205	640
	12 x 2,5 RE/ 4	23,4	334	800
	24 x 1,5 RE/ 6	28,3	413	1080
	24 x 2,5 RE/ 10	30,9	696	1410
	30 x 1,5 RE/ 6	29,7	499	1250
	30 x 2,5 RE/ 10	32,7	840	1650

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

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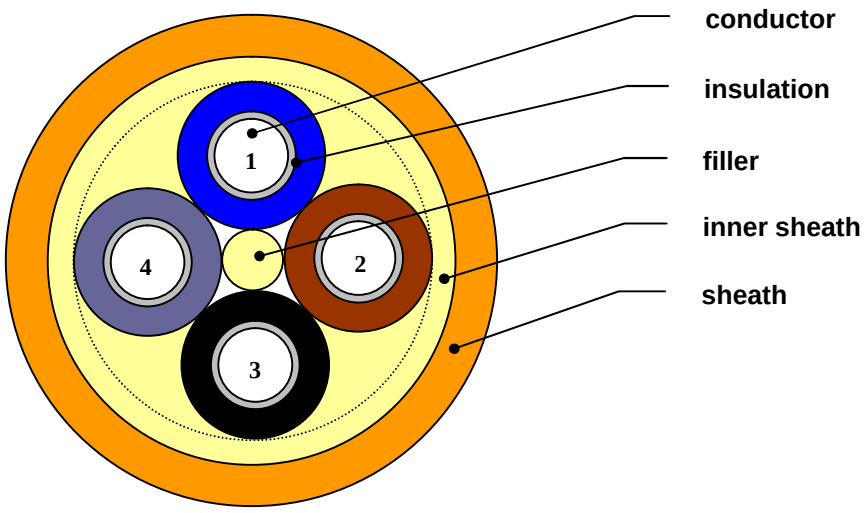
(N)HXH FE180 PH90/E90 0,6/1 kV; (N)HXH-J FE180 PH90/E90 0,6/1 kV

FIRE RESISTANT HALOGEN FREE POWER CABLES



APPLICATIONS

(N)HXH FE180 PH90/E90 0.6/1 kV and (N)HXH-J FE180 PH90/E90 0.6/1 kV fire resistant power cables, insulated and sheathed with halogen free compounds, are intended for power supply to fire protection equipment which is to operate in fire conditions (e.g. water pumps in fire extinguishing systems, smoke removing fans).

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

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

The cables are suitable for indoor and outdoor installations.

CONSTRUCTION

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

(N)HXH FE180 PH90/E90 0,6/1 kV; (N)HXH-J FE180 PH90/E90 0,6/1 kV____

CHARACTERISTICS

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

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

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

Operating temperature range	
during operation	from -30 to +90°C
during installation	from -5 to +50°C
Minimum bending radius:	single core cables -15 x cable diameter multi core cables -12 x cable diameter
Cable combustibility	flame retardant
Circuit integrity *	
E90	DIN 4102-12
PH90	PN-EN 50200 or PN-EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Combustibility tests	PN-EN 50266-2-4, IEC 60332-3-24 PN-EN 50200 and PN-EN 50362
Reference standards	AT-0603-0064/2006, WT-TK-44 DIN VDE 0266, PN-HD 604 S1

*Circuit integrity is dependent on installation method.

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

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

Article No.	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
	3 x 16 RE	22	461	980
	3 x 25 RM	25	720	1390
	4 x 1,5 RE	14	58	270
	4 x 2,5 RE	16	96	320
	4 x 4,0 RE	17	154	410
	4 x 6,0 RE	18	230	525
	4 x 10 RE	20	384	735
	4 x 16 RM	23	614	1140
	4 x 25 RM	27	960	1620
	4 x 35 RM	29	1344	2050
	4 x 50 RM	32	1920	2660
	5 x 1,5 RE	17	72	325
	5 x 2,5 RE	18	120	405
	5 x 4,0 RE	19	192	510
	5 x 6,0 RE	20	288	650
	5 x 10 RE	22	480	900
	5 x 16 RE	26	768	1360
	5 x 25 RM	30	1200	2000
	5 x 35 RM	32	1680	2550
	5 x 50 RM	37	2400	3450
	7 x 1,5 RE	18	101	375

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

Other cross-sections and conductor counts available on request.

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

FIRE RESISTANT HALOGEN FREE POWER CABLES

APPLICATIONS

HDGs(żo) FE180 PH90/E30-E90 300/500 V, HLGs(żo) FE180 PH90/E30-E90 300/500 V fire resistant cables and **HDGsekw(żo) FE180 PH90/E30-E90 300/500 V, HLGsekw(żo) FE180 PH90/E30-E90 300/500 V** screened fire resistant cables, are intended for power supply to fire protection equipment which is to operate in fire conditions. The cables are suitable for installation in alarm, signalling, transmission, sound warning and similar systems.

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

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

The cables are certified by Scientific and Research Development Centre for Fire Protection (Centrum Naukowo-Badawcze Ochrony Przeciwpożarowej) at Józefów – **Certificate of Conformity No. 2698/2009**.

An overall electrostatic shield **(ekw)** in screened cables protects cable circuits against interference by external electric fields.

CONSTRUCTION

– bare copper, single wire **(D)** or stranded multi wire **(L)**, round conductors meeting requirements of class 1 or 5 per PN-EN 60228,

– special silicone rubber insulation,

– identification colour code according to PN-HD 308 S2,

– insulated conductors laid-up in layers,

– cable core wrapped in polyester tape - in **HDGsekw** and **HLGsekw**,

– overall electrostatic shield incorporating aluminium-polyester tape and stranded annealed tinned copper drain wire - in **HDGsekw** and **HLGsekw**,

–red cable sheath of halogen free compound.

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

CHARACTERISTICS

Conductor diameter	mm	**1,0**	**1,1**	**1,4**	**1,8**	**2,3**	**2,8**
Conductor cross-section	mm^2	**0,75**	**1**	**1,5**	**2,5**	**4**	**6**
DC conductor resistance at 20°C, maximum	Ω/km	26,0	19,5	13,3	7,98	4,95	3,30
Capacitance between conductors at 1 kHz, – maximum	nF/km	120	120	120	120	120	120
– average		70	70	80	80	100	100

Operating voltage U_o/U	300/500 V
Voltage test	2 kVrms
Insulation resistivity at 20°C, minimum	100 MΩ·km
Inductance, approximate	0,7 mH/km
Conductor temperature limit	
in work conditions	+ 85°C
in short-circuit (max 5 s)	+ 250°C
Operating temperature range	
during operation	from - 25 to + 85°C
during installation	from -10 to + 50°C
Minimum bending radius	
HDGs(ekw) cables	10 x cable diameter
HLGs(ekw)cables	6 x cable diameter

Corrosivity of emitted gases	very low, halogen free PN-EN 50267-2-3, IEC 60754-2
pH, aprox.	6,8
conductivity, aprox.	0,4 µS/cm
Smoke density per	low smoke density PN-EN 50268-2-3, IEC 61034-2
light transmittance, minimum	94 %
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2, IEC 60332-1, PN-EN 60332-3-22, IEC 60332-3-22 (cat.A)
Circuit integrity*	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	AT-603-0248/2009 and WT-TK-46

*Circuit integrity is dependent on installation method.

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

Cable type	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
HDGs	2 x 0,75	6,4	14,4	50
HDGs	2 x 1	6,6	19,2	55
HDGs	2 x 1,5	7,5	28,8	75
HDGs	2 x 2,5	8,9	48	105
HDGs	2 x 4	9,8	77	140
HDGs	2 x 6	11,6	115	200
HDGs	3 x 0,75	7,1	21,6	68
HDGs	3 x 1	7,2	28,8	70
HDGs	3 x 1,5	8,2	43,2	95
HDGs	3 x 2,5	9,7	72	140
HDGs	3 x 4	10,9	115	200
HDGs	3 x 6	12,8	173	280
HDGs	4 x 0,75	6,4	28,8	60
HDGs	4 x 1	7,6	38,4	90

Cable type	Number of conductors x conductor cross-section	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm^2	mm	kg/km	kg/km
HDGs	4 x 1,5	8,9	58	125
HDGs	4 x 2,5	10,4	96	185
HDGs	4 x 4	11,5	154	250
HDGs	4 x 6	13,7	230	360
HDGs	5 x 0,75	6,5	36	68
HDGs	5 x 1	8,5	48	110
HDGs	5 x 1,5	9,9	72	155
HDGs	5 x 2,5	11,4	120	220
HDGs	5 x 4	12,6	192	305
HDGs	5 x 6	15,1	288	450
HLGs	2 x 1	6,8	19,2	55
HLGsekw	2 x 1	7,0	19,2	65
HDGsekw	2 x 1	6,8	19,2	55

Other cross-sections and conductor counts available on request.

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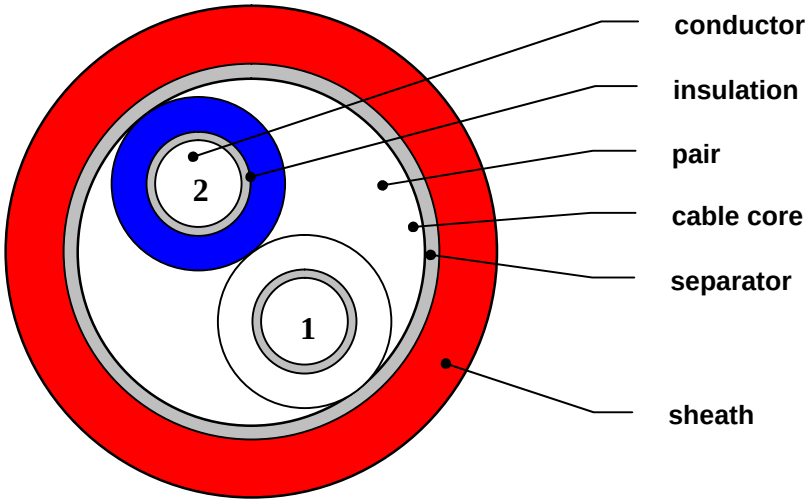
HTKSH FE180 PH90/E30-E90

FIRE RESISTANT HALOGEN FREE CABLES



APPLICATIONS

HTKSH FE180 PH90/E30-E90 fire resistant and halogen free cables are intended for installation in alarm, signalling, transmission, sound warning and similar systems, also for data processing systems and for analogue or digital data transmission in industrial electronics and control applications in objects of sharp fire protection requirements, particularly in fire alarm and fire automatic control systems.

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

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

The cables are suitable for indoor installations.

CONSTRUCTION

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

HTKSH FE180 PH90/E30-E90

CHARACTERISTICS

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

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

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

Operating temperature range	
during operation	from - 30 to + 80°C
during installation	from - 5 to + 50°C
Minimum bending radius	10 x cable diameter
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2
Circuit integrity *	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	WT-TK-43 PN-92/T-90320 PN-92/T-90321

*Circuit integrity is dependent on installation method.

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

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

Other diameters and conductor counts available on request.

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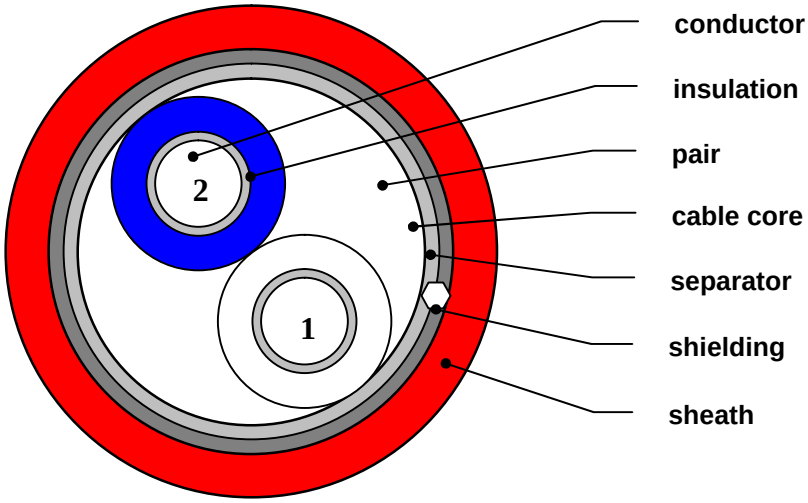
HTKSHekw FE180 PH90/E30-E90

FIRE RESISTANT HALOGEN FREE CABLES



APPLICATIONS

HTKSHekw FE180 PH90/E30-E90 fire resistant and halogen free cables are intended for installation in alarm, signalling, transmission, sound warning and similar systems, also for data processing systems and for analogue or digital data transmission in industrial electronics and control applications in objects of sharp fire protection requirements, particularly in fire alarm and fire automatic control systems.

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

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

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

The cables are suitable for indoor installations.

CONSTRUCTION

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

HTKSHekw FE180 PH90/E30-E90

CHARACTERISTICS

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

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

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

Operating temperature range	
during operation	from - 30 to + 80°C
during installation	from - 5 to + 50°C
Minimum bending radius	10 x cable diameter
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2
Circuit integrity *	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	WT-TK-43 PN-92/T-90320 PN-92/T-90321

*Circuit integrity is dependent on installation method.

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

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

Other diameters and conductor counts available on request.

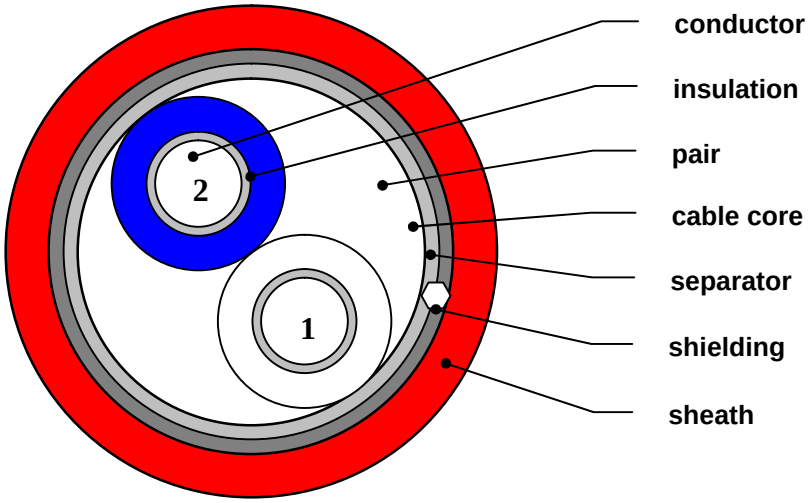
TECHNOKABEL®

CE RoHS

ISO 9001:2008

JE-H(St)H...Bd FE180 PH90/E30-E90

FIRE RESISTANT HALOGEN FREE CABLES



APPLICATIONS

JE-H(St)H…Bd FE180 PH90/E30-E90 fire resistant and halogen free cables are intended for installation in alarm, signalling, transmission, sound warning and similar systems, also for data processing systems and for analogue or digital data transmission in industrial electronics and control applications in objects of sharp fire protection requirements, particularly in fire alarm and fire automatic control systems.

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

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

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

The cables are suitable for indoor installations.

CONSTRUCTION

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

JE-H(St)H...Bd FE180 PH90/E30-E90

CHARACTERISTICS

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

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

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

Operating temperature range	
during operation	from - 30 to + 80°C
during installation	from - 5 to + 50°C
Minimum bending radius	10 x cable diameter
Cable combustibility	flame retardant
Combustibility tests	PN-EN 60332-1-2
Circuit integrity *	
E30-E90	DIN 4102-12
PH90	PN-EN 50200 or EN 50362
Insulation integrity FE180	IEC 60331-21; IEC 60331-11
Reference standards	VDE 0815

*Circuit integrity is dependent on installation method.

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

Cable type	Number of pairs (x 2) x conductor diameter	Cable outer diameter (appr.)	Copper index	Cable weight (appr.)
	mm	mm	kg/km	kg/km
JE-H(St)H FE180 PH90/E30-E90	1 x 2 x 0,8 Bd	7.4	15	66

Other diameters and conductor counts available on request.

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K216A042011

Badanie zespołu kablowego BAKS - TECHNOKABEL
Badanie w FIRES Słowacja Data 14.04.2011

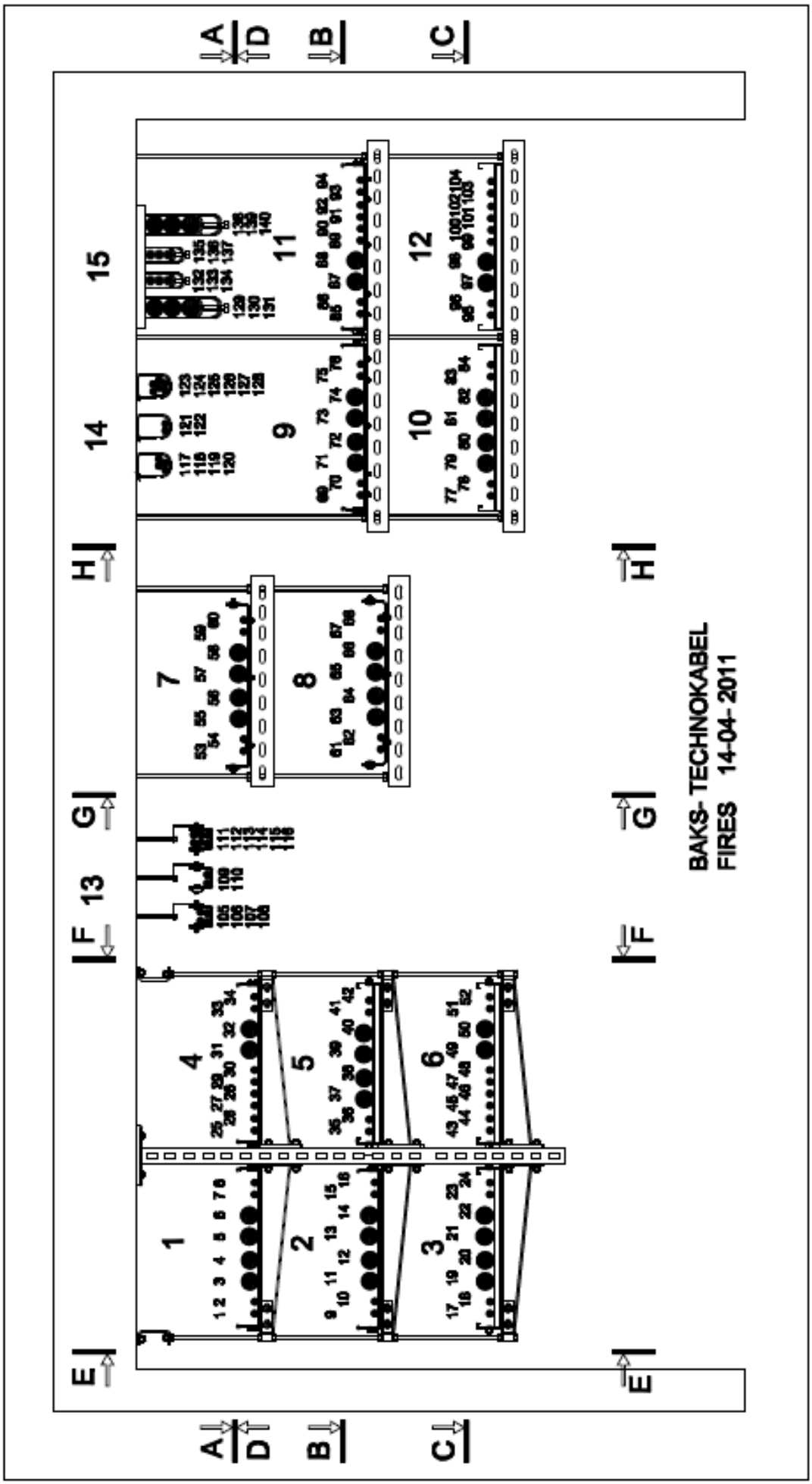
Nr	Nr FIRES	Symbol kabla	Pozycja	Konstrukcja mocowania, odległość, obciążenie
1	48	NHXH-J FE180 PH30/E30 4x1.5 RE	1	Korytko kablowe KCOP 400H60/... F B-400, 1.5 m /10kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wysięgnik WMCO400, pręt gwintowany PGM10… , uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x 80.
2		NHXH-J FE180 PH30/E30 4x1.5 RE		
3	47	NHXH-J FE180 PH30/E30 4x50 RM		
4		NHXH-J FE180 PH30/E30 4x50 RM		
5	46	NHXH-J FE180 PH90/E90 4x50 RM		
6		NHXH-J FE180 PH90/E90 4x50 RM		
7	45	NHXH-J FE180 PH90/E90 4x1.5 RE		
8		NHXH-J FE180 PH90/E90 4x1.5 RE		
9	44	(N)HXH-J FE180 PH30/E30 4x1.5 RE	2	Korytko kablowe KCOP 400H60/... F B-400, 1.5 m /10kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wysięgnik WMCO400, pręt gwintowany PGM10… , uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x 80.
10		(N)HXH-J FE180 PH30/E30 4x1.5 RE		
11	43	(N)HXH-J FE180 PH30/E30 4x50 RM		
12		(N)HXH-J FE180 PH30/E30 4x50 RM		
13	42	(N)HXH-J FE180 PH90/E90 4x50 RM		
14		(N)HXH-J FE180 PH90/E90 4x50 RM		
15	41	(N)HXH-J FE180 PH90/E90 4x1.5 RE		
16		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
17	40	NHXH-J FE180 PH30/E30 4x1.5 RE	3	Drabinka kablowa DGOP 400H60/...F B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wysięgnik WMCO400, pręt gwintowany PGM10… , uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x 80.
18		NHXH-J FE180 PH30/E30 4x1.5 RE		
19	39	NHXH-J FE180 PH30/E30 4x50 RM		
20		NHXH-J FE180 PH30/E30 4x50 RM		
21	38	NHXH-J FE180 PH90/E90 4x50 RM		
22		NHXH-J FE180 PH90/E90 4x50 RM		
23	37	NHXH-J FE180 PH90/E90 4x1.5 RE		
24		NHXH-J FE180 PH90/E90 4x1.5 RE		
25	71B	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	4	Korytko kablowe KCOP 400H60/... F B-400, 1.5 m /10kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wysięgnik WMCO400, pręt gwintowany PGM10… , uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x 80.
26	71A	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
27	70B	HTKSH FE180 PH90/E90 1x2x0,8 mm		
28	70A	HTKSH FE180 PH90/E90 1x2x0,8 mm		
29	69B	HDGs FE180 PH90/E30-E90 2x1 mm^2		
30	69A	HDGs FE180 PH90/E30-E90 2x1 mm^2		
31	36	NHXCH FE180 PH90/E90 4x50/25 RM		
32		NHXCH FE180 PH90/E90 4x50/25 RM		
33	35	NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
34		NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
35	34	(N)HXCH FE180 PH30/E30 4x1.5/1.5 RE	5	Drabinka kablowa DGOP 400H60/...F B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wysięgnik WMCO400, pręt gwintowany PGM10… , uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x 80.
36		(N)HXCH FE180 PH30/E30 4x1.5/1.5 RE		
37	33	NHXH-J FE180 PH90/E90 4x50 RM		
38		NHXH-J FE180 PH90/E90 4x50 RM		
39	32	NHXCH FE180 PH30/E30 4x50/25 RM		
40		NHXCH FE180 PH30/E30 4x50/25 RM		
41	31	NHXCH FE180 PH30/E30 4x1.5/1.5 RE		
42		NHXCH FE180 PH30/E30 4x1.5/1.5 RE		
43	68B	HTKSHekw FE180 PH90/E90 1x2x0,8 mm	6	Drabinka kablowa DGOP 400H60/...F B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : Wspornik WPCO, Wysięgnik WMCO400, pręt gwintowany PGM10… , uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x 80.
44	68A	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
45	67B	HTKSH FE180 PH90/E90 1x2x0,8 mm		
46	67A	HTKSH FE180 PH90/E90 1x2x0,8 mm		
47	66B	HDGs FE180 PH90/E30-E90 2x1 mm^2		
48	66A	HDGs FE180 PH90/E30-E90 2x1 mm^2		
49	30	NHXCH FE180 PH90/E90 4x50/25 RM		
50		NHXCH FE180 PH90/E90 4x50/25 RM		
51	29	NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
52		NHXCH FE180 PH90/E90 4x1.5/1.5 RE		

Nr	Nr FIRES	Symbol kabla	Pozycja	Konstrukcja mocowania, odległość, obciążenie
53	**26**	NHXCH FE180 PH90/E90 4x1.5/1.5 RE	7	Korytko siatkowe KDS 400H60/... F B-400/ 1.5 m / 20kg/m Mocowanie na ceowniku CWOP 40H40/ …F prętach gwintowanych PGM10/1 do betonu za pomocą kołków rozporowych TRSO M10x 40
54		NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
55	**25**	NHXCH FE180 PH90/E90 4x50/25 RM		
56		NHXCH FE180 PH90/E90 4x50/25 RM		
57	**24**	NHXH-J FE180 PH90/E90 4x50 RM		
58		NHXH-J FE180 PH90/E90 4x50 RM		
59	**23**	NHXH-J FE180 PH90/E90 4x1.5 RE		
60		NHXH-J FE180 PH90/E90 4x1.5 RE		
61	**22**	(N)HXH-J FE180 PH30/E30 4x1.5 RE	8	Korytko siatkowe KDS 400H60/... F B-400/ 1.5 m / 20kg/m Mocowanie na ceowniku CWOP 40H40/ …F prętach gwintowanych PGM10/1 do betonu za pomocą kołków rozporowych TRSO M10x 40
62		(N)HXH-J FE180 PH30/E30 4x1.5 RE		
63	**21**	(N)HXH-J FE180 PH30/E30 4x50 RM		
64		(N)HXH-J FE180 PH30/E30 4x50 RM		
65	**20**	(N)HXH-J FE180 PH90/E90 4x50 RM		
66		(N)HXH-J FE180 PH90/E90 4x50 RM		
67	**19**	(N)HXH-J FE180 PH90/E90 4x1.5 RE		
68		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
69	**16**	NHXH-J FE180 PH30/E30 4x1.5 RE	9	Korytko kablowe KCOP 400H60/... L B-400, 1.5 m /10kg/m / grubość blachy 1,5 mm Mocowanie : na ceowniku CWOP 40H40/ …L prętach gwintowanych PGM10/1 do betonu za pomocą kołków rozporowych TRSO M10x 40
70		NHXH-J FE180 PH30/E30 4x1.5 RE		
71	**15**	NHXH-J FE180 PH30/E30 4x50 RM		
72		NHXH-J FE180 PH30/E30 4x50 RM		
73	**14**	NHXH-J FE180 PH90/E90 4x50 RM		
74		NHXH-J FE180 PH90/E90 4x50 RM		
75	**13**	NHXH-J FE180 PH90/E90 4x1.5 RE		
76		NHXH-J FE180 PH90/E90 4x1.5 RE		
77	**12**	NHXH-J FE180 PH30/E30 4x1.5 RE	10	Drabinka kablowa DGOP 400H60/...L B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : na ceowniku CWOP 40H40/ …L prętach gwintowanych PGM10/1 do betonu za pomocą kołków rozporowych TRSO M10x 40
78		NHXH-J FE180 PH30/E30 4x1.5 RE		
79	**11**	NHXH-J FE180 PH30/E30 4x50 RM		
80		NHXH-J FE180 PH30/E30 4x50 RM		
81	**10**	NHXH-J FE180 PH90/E90 4x50 RM		
82		NHXH-J FE180 PH90/E90 4x50 RM		
83	**9**	NHXH-J FE180 PH90/E90 4x1.5 RE		
84		NHXH-J FE180 PH90/E90 4x1.5 RE		
85	**8**	NHXCH FE180 PH90/E90 4x1.5/1.5 RE	11	Korytko kablowe KCOP 400H60/... L B-400, 1.5 m /10kg/m / grubość blachy 1,5 mm Mocowanie : na ceowniku CWOP 40H40/ …L prętach gwintowanych PGM10/1 do betonu za pomocą kołków rozporowych TRSO M10x 40
86		NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
87	**7**	NHXCH FE180 PH90/E90 4x50/25 RM		
88		NHXCH FE180 PH90/E90 4x50/25 RM		
89	**57B**	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
90	**57A**	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
91	**56B**	HTKSH FE180 PH90/E90 1x2x0,8 mm		
92	**56A**	HTKSH FE180 PH90/E90 1x2x0,8 mm		
93	**55B**	HDGs FE180 PH90/E30-E90 2x1 mm^2		
94	**55A**	HDGs FE180 PH90/E30-E90 2x1 mm^2		
95	**6**	NHXCH FE180 PH90/E90 4x1.5/1.5 RE	12	Drabinka kablowa DGOP 400H60/...L B-400/ 1.5 m / 20kg/m / grubość blachy 1,5 mm Mocowanie : na ceowniku CWOP 40H40/ …L prętach gwintowanych PGM10/1 do betonu za pomocą kołków rozporowych TRSO M10x 40
96		NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
97	**5**	NHXCH FE180 PH90/E90 4x50/25 RM		
98		NHXCH FE180 PH90/E90 4x50/25 RM		
99	**54B**	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
100	**54A**	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
101	**53B**	HTKSH FE180 PH90/E90 1x2x0,8 mm		
102	**53A**	HTKSH FE180 PH90/E90 1x2x0,8 mm		
103	**52B**	HDGs FE180 PH90/E30-E90 2x1 mm^2		
104	**52A**	HDGs FE180 PH90/E30-E90 2x1 mm^2		

Nr	Nr FIRES	Symbol kabla	Pozycja	Konstrukcja mocowania, odległość, obciążenie
105	**65B**	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	13	Korytko siatkowe KDS 60H60/...F B-60/ 1.5 m / 1,5kg/m Mocowanie na uchwycie WKSO 60 F i prętach gwintowanych PGM6/1 do betonu za pomocą tuleji stalowych rozporowych TSRO M6x30
106	**65A**	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
107	**28**	(N)HXH-J FE180 PH90/E90 4x1.5 RE		
108		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
109	**27**	NHXH-J FE180 PH90/E90 4x1.5 RE		
110		NHXH-J FE180 PH90/E90 4x1.5 RE		
111	**64B**	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
112	**64A**	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
113	**63B**	HTKSH FE180 PH90/E90 1x2x0,8 mm		
114	**63A**	HTKSH FE180 PH90/E90 1x2x0,8 mm		
115	**62B**	HDGs FE180 PH90/E30-E90 2x1 mm^2		
116	**62A**	HDGs FE180 PH90/E30-E90 2x1 mm^2		
117	**61B**	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm	14	Obejma OZSO Mocowanie do betonu co 600 mm za pomocą stalowego łącznika rozporowego SRO M6x30
118	**61A**	JE-H(St)H FE180 PH90/E90 1x2x0,8 mm		
119	**18**	NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
120		NHXCH FE180 PH90/E90 4x1.5/1.5 RE		
121	**17**	NHXH-J FE180 PH90/E90 4x1.5 RE		
122		NHXH-J FE180 PH90/E90 4x1.5 RE		
123	**60B**	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
124	**60A**	HTKSHekw FE180 PH90/E90 1x2x0,8 mm		
125	**59B**	HTKSH FE180 PH90/E90 1x2x0,8 mm		
126	**59A**	HTKSH FE180 PH90/E90 1x2x0,8 mm		
127	**58B**	HDGs FE180 PH90/E30-E90 2x1 mm^2		
128	**58A**	HDGs FE180 PH90/E30-E90 2x1 mm^2		
129	**4**	(N)HXH-J FE180 PH90/E90 4x50 RM	15	Uchwyt kablowy UKO2 + Szczebel SDOP500 Mocowanie do betonu co 600 mm za pomocą stalowego łącznika rozporowego SRO M6x30 Po 3 kable w uchwycie
130		(N)HXH-J FE180 PH90/E90 4x50 RM		
131		(N)HXH-J FE180 PH90/E90 4x50 RM		
132	**3**	(N)HXH-J FE180 PH90/E90 4x1.5 RE		
133		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
134		(N)HXH-J FE180 PH90/E90 4x1.5 RE		
135	**2**	NHXH-J FE180 PH90/E90 4x1.5 RE		
136		NHXH-J FE180 PH90/E90 4x1.5 RE		
137		NHXH-J FE180 PH90/E90 4x1.5 RE		
138	**1**	NHXH-J FE180 PH90/E90 4x50 RM		
139		NHXH-J FE180 PH90/E90 4x50 RM		
140		NHXH-J FE180 PH90/E90 4x50 RM		

Zestawienie kabli Technokabel:

Lp	Symbol kaba		Średnica kabla (około)	Ciężar kabla (około)	Ilość
1	NHXH-J	FE 180 PH30/E30 4x 1,5 RE	14 mm	0,25 kg/m	8
2	NHXH-J	FE 180 PH30/E30 4x 50 RM	32 mm	2,65 kg/m	8
3	NHXH-J	FE 180 PH90/E90 4x 1,5 RE	14 mm	0,26 kg/m	17
4	NHXH-J	FE 180 PH90/E90 4x 50 RM	33 mm	2,65 kg/m	15
5	NHXCH	FE 180 PH30/E30 4x 1,5/1,5 RE	15 mm	0,35 kg/m	2
6	NHXCH	FE 180 PH30/E30 4x 50/25 RM	35 mm	2,9 kg/m	2
7	NHXCH	FE 180 PH90/E90 4x 1,5/1,5 RE	15 mm	0,32 kg/m	12
8	NHXCH	FE 180 PH90/E90 4x 50/25 RM	36 mm	2,95 kg/m	10
9	(N)HXH-J	FE 180 PH30/E30 4x 1,5 RE	14 mm	0,26 kg/m	4
10	(N)HXH-J	FE 180 PH30/E30 4x 50 RM	33 mm	2,8 kg/m	4
11	(N)HXH-J	FE 180 PH90/E90 4x 1,5 RE	14 mm	0,27 kg/m	9
12	(N)HXH-J	FE 180 PH90/E90 4x 50 RM	33 mm	2,8 kg/m	7
13	(N)HXCH	FE 180 PH30/E30 4x 1,5/1,5 RE	15 mm	0,32 kg/m	2
14	HDGs	FE180 PH90/E30-E90 2x1,0 mm^2	6 mm	0,1 kg/m	12
15	HTKSH	FE180 PH90/E30-E90 1x2x0,8 mm	8 mm	0,1 kg/m	12
16	HTKSHekw	FE180 PH90/E30-E90 1x2x0,8 mm	8 mm	0,1 kg/m	12
17	JE-H(St)H	FE180 PH90/E30-E90 1x2x0,8 mm	8 mm	0,1 kg/m	4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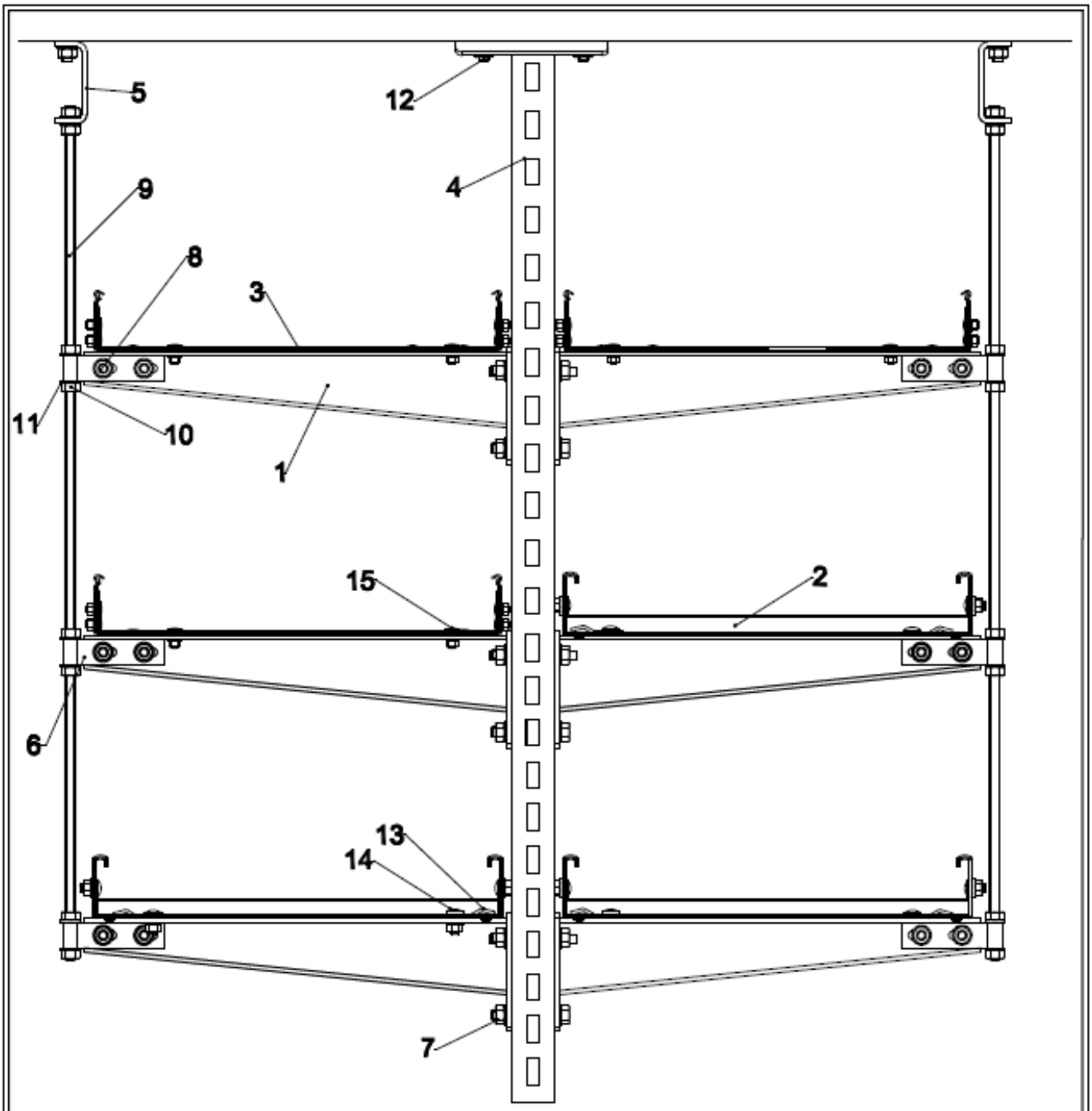
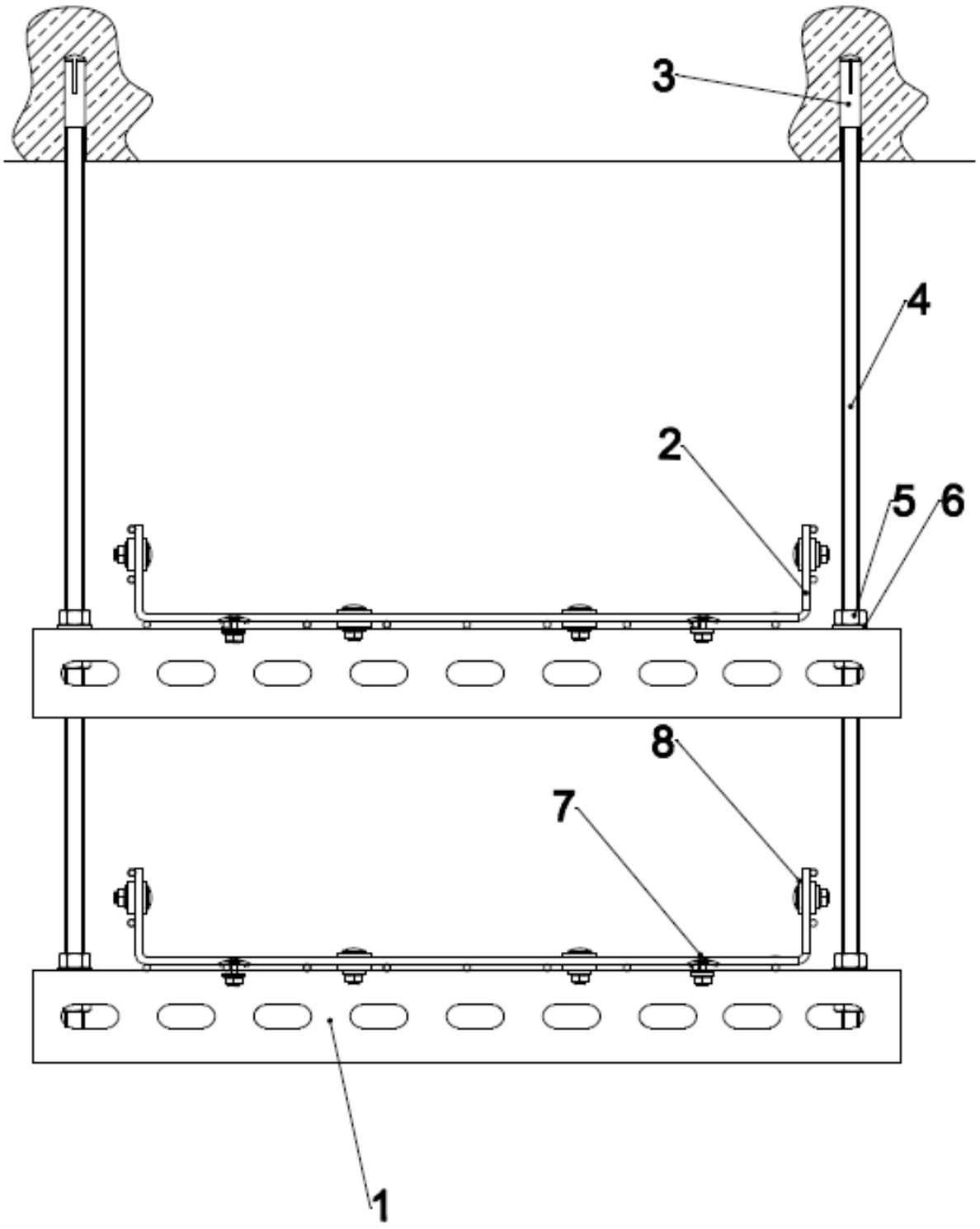
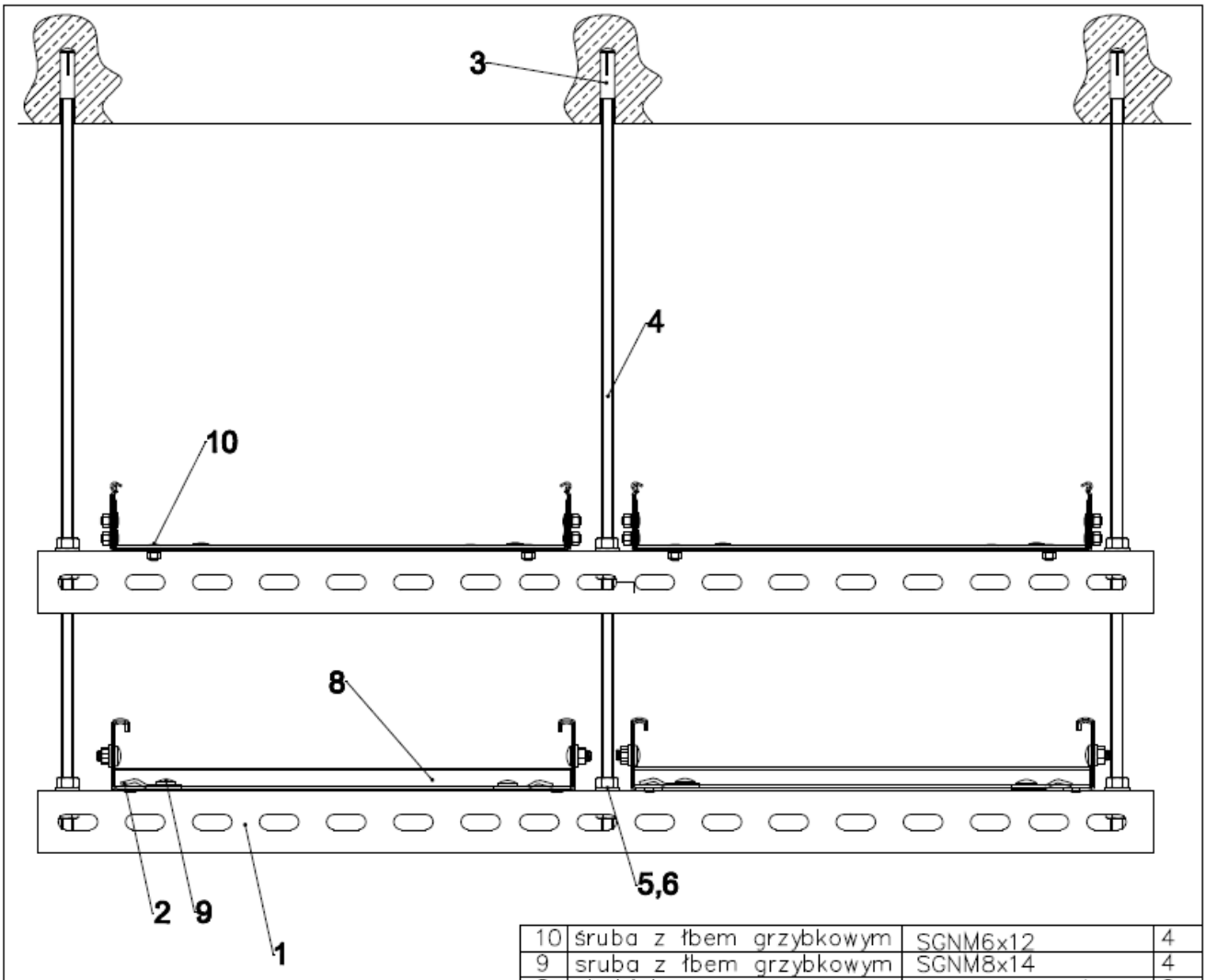
FIRES 14-04- 2011



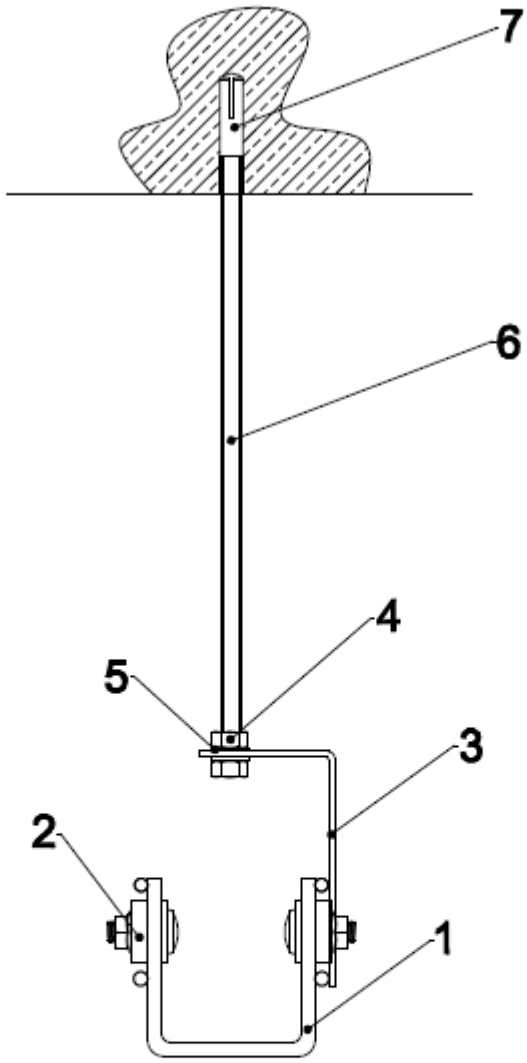
LP.	NAZWA	SYMBOL	szt.
15	śruba z łbem grzybkowym	SGNM6x12–F	6
14	śruba z łbem grzybkowym	SGNM8x14–F	6
13	Zacisk mocujący	ZMO–F	6
12	śruba tulejowa rozporowa	PSROM10x80	4
11	podkładka	PP10–F	16
10	nakrętka	NSM10–F	16
9	pręt gwintowany	PGM10	2
8	śruba z łbem grzybkowym	SGMN8x14–F	12
7	śruba komplet	SMM10x20–F	6
6	uchwyt	UPWO–F	2
5	uchwyt sufitowy	USOV–F	2
4	wspornik sufitowy	WPCO1000	1
3	korytko	KCOP400H60/3N–F	3
2	drabikna	DGOP400H60/3N–F	3
1	wysięgnik	WMCO400	6



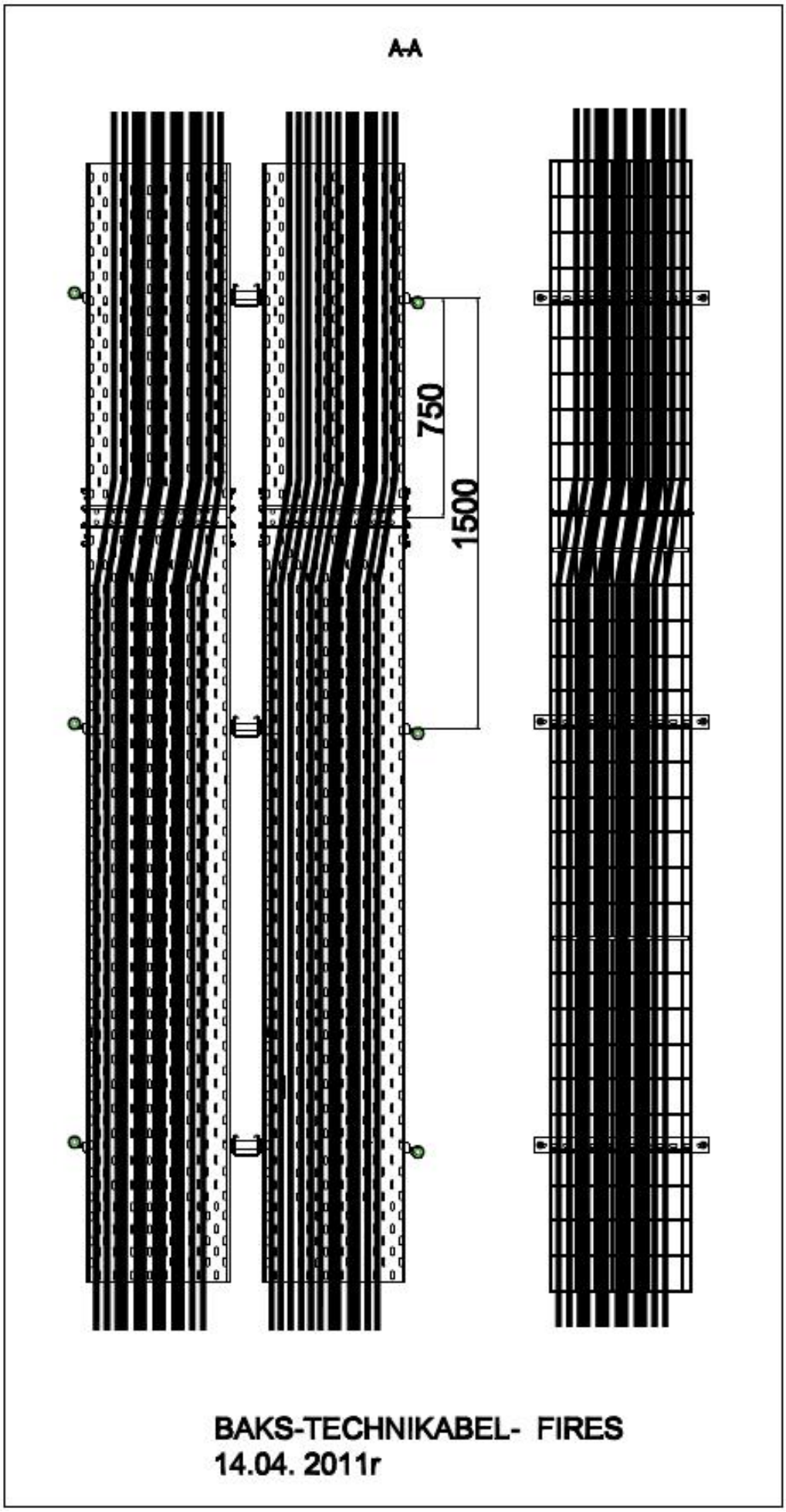
LP	NAZWA	SYMBOL	szt.
8	uchwyt śrubowy	USSO	8
7	zacisk śrubowy	ZSO–F	4
6	podkładka	PP10	8
5	nakrętka	NSM10	8
4	pręt gwintowany	PGM10	2
3	tuleja rozporowa stalowa	TRSOM10	2
2	korytko siatkowe	KDSO400H60/3–F	2
1	ceownik wzmocniony	CWOP40H40/05–F	2

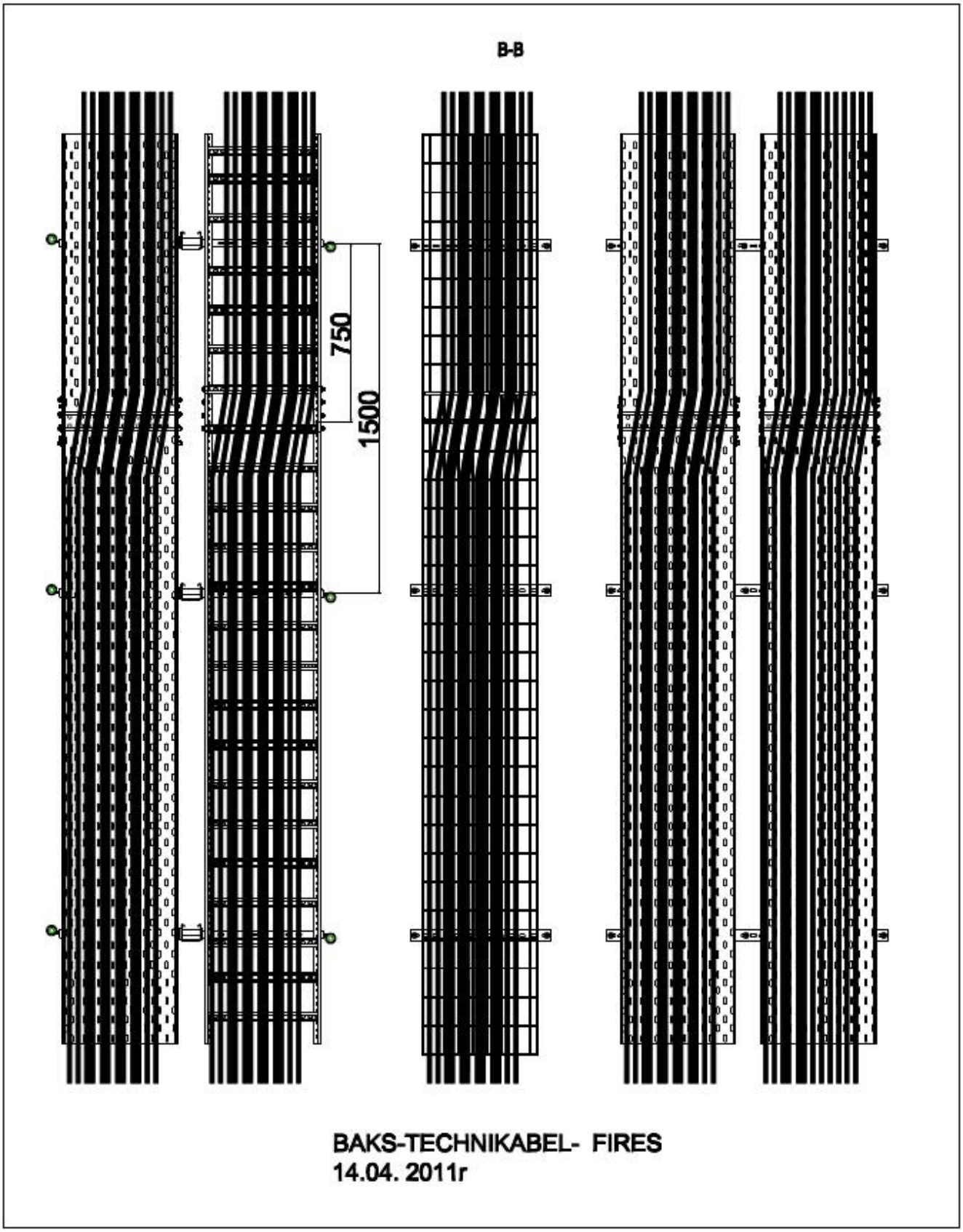


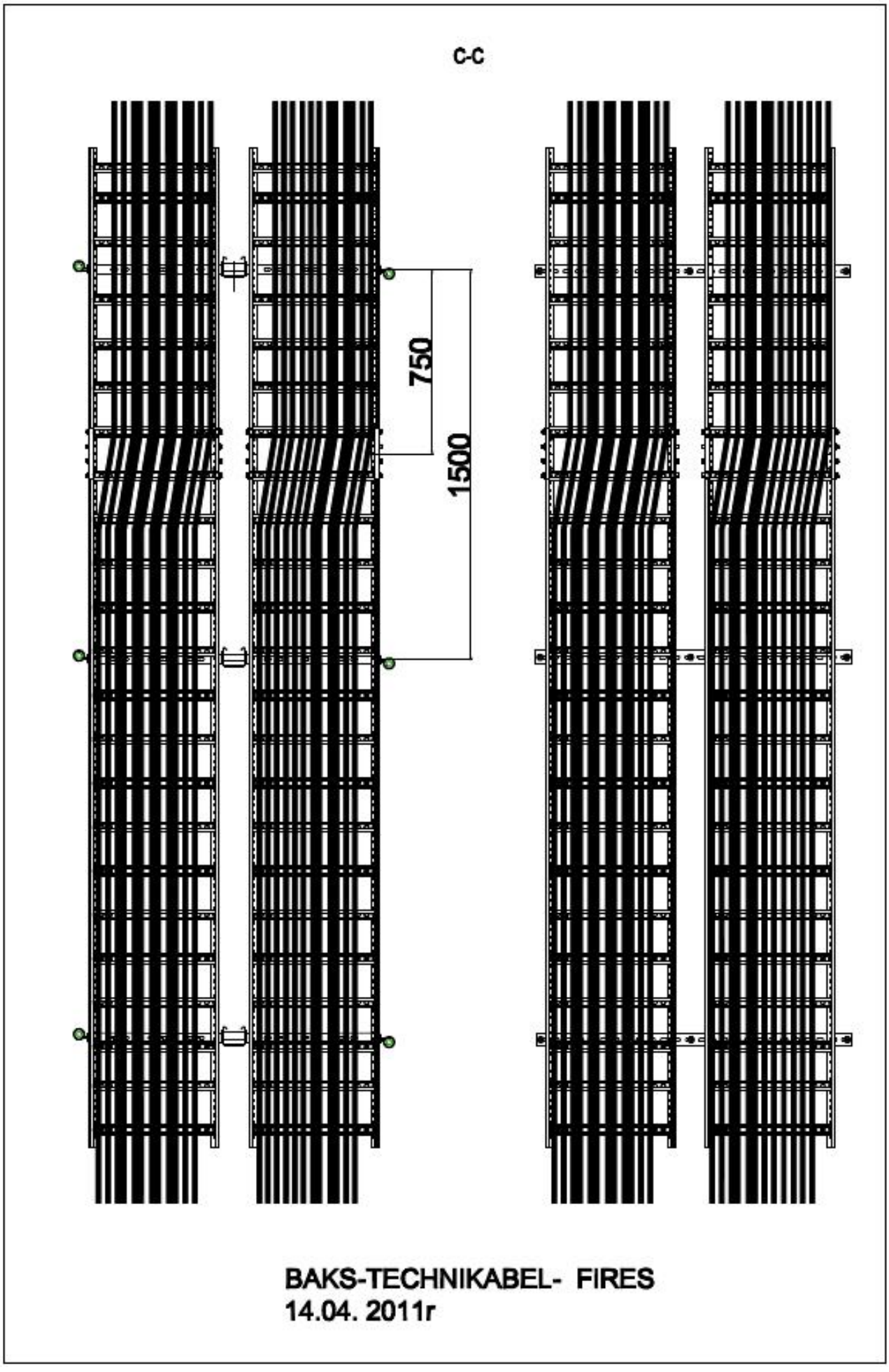
LP	NAZWA	SYMBOL	szt.
10	śruba z łbem grzybkowym	SGNM6x12	4
9	sruba z łbem grzybkowym	SGNM8x14	4
8	drabinka	DGOP400H60/3N–L	2
7	korytko	KCOP400H60/3N–L	2
6	podkładka	PP10	8
5	nakrętka	NSM10	8
4	pręt gwintowany	PGM10	2
3	tuleja rozporowa stalowa	TRSOM10	2
2	zacisk mocujący	ZMO	4
1	ceownik wzmocniony	CWOP40H40/1–L	2

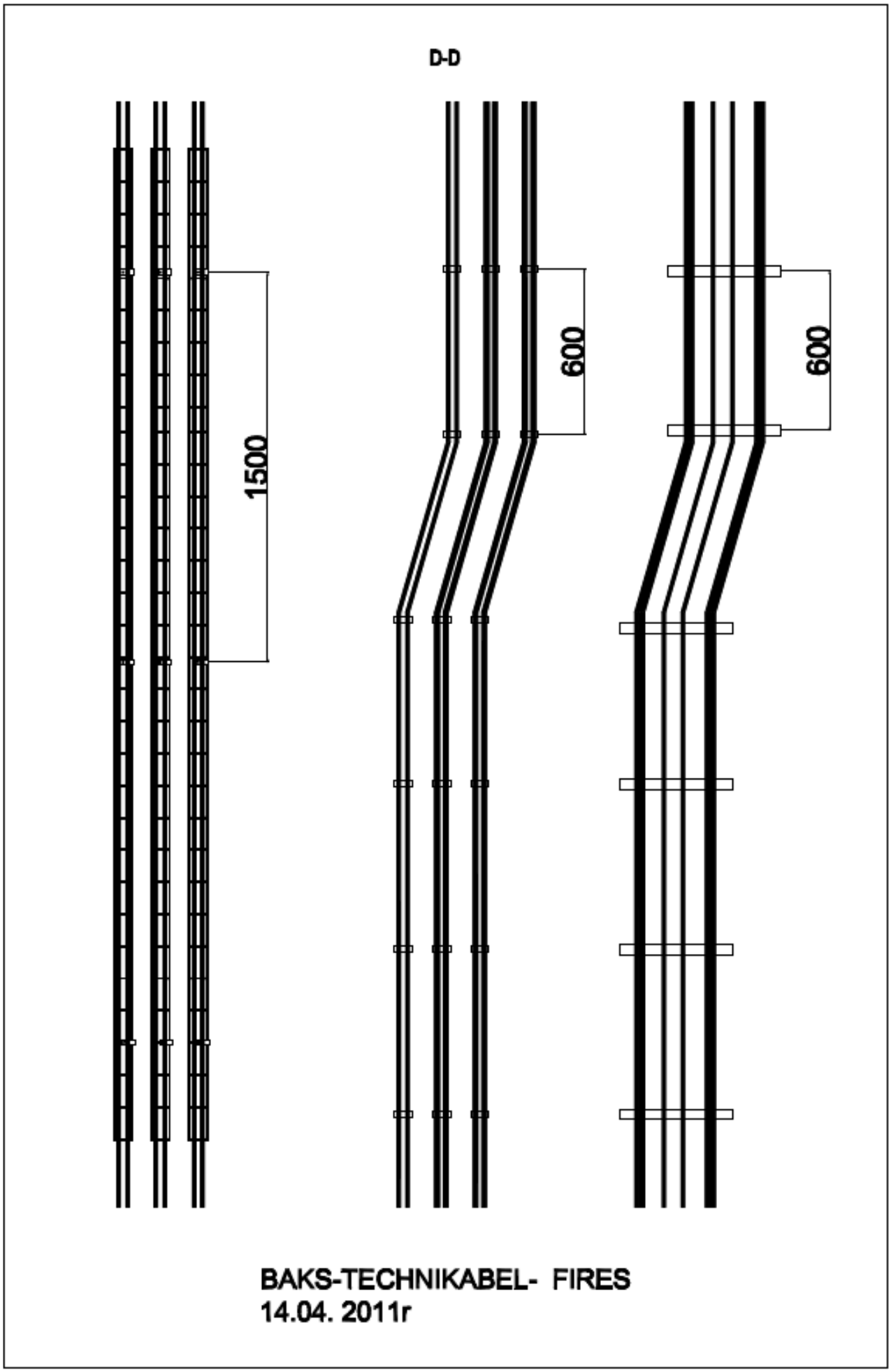


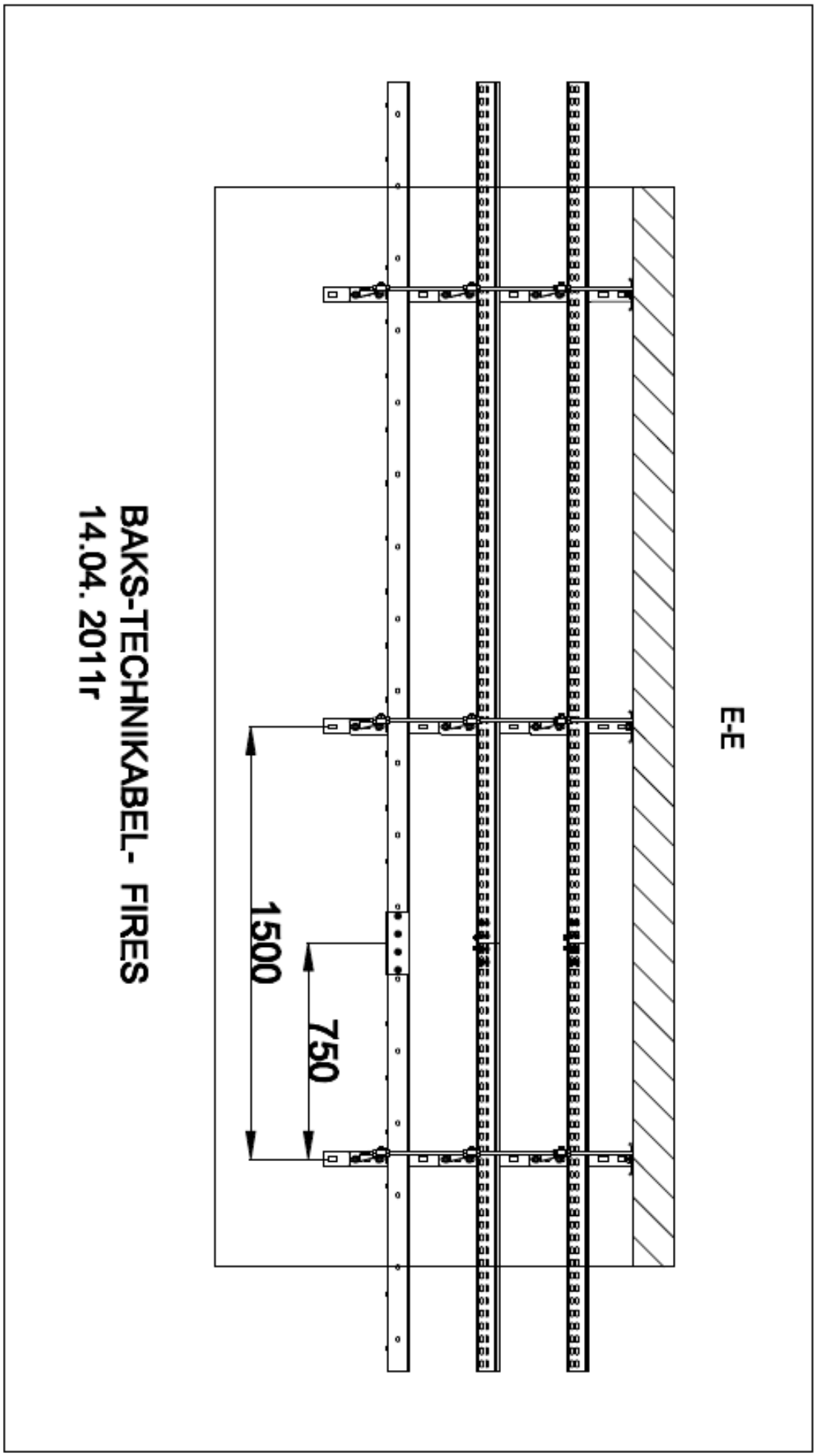
LP	NAZWA	SYMBOL	szt.
1	korytko siatkowe	KDSO60H60–F	1
2	uchwyt śrubowy	USSO	2
3	wieszak	WKSO60–F	1
4	nakrętka	NSM6	2
5	podkładka	PP6	2
6	pręt gwintowany	PGM6	1
7	tuleja rozporowa stalowa	TRSOM6	1

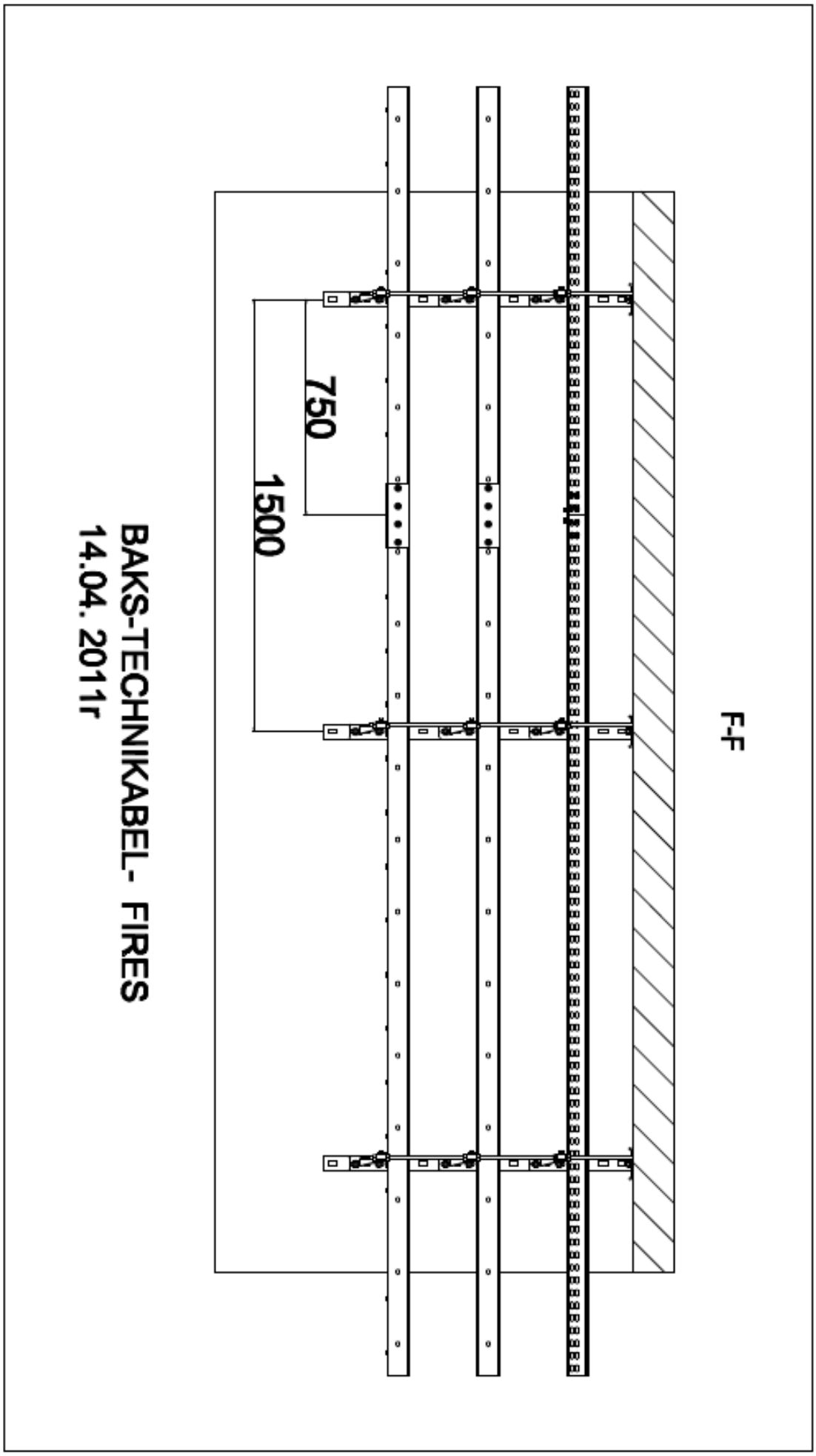

A-A
750
1500
BAKS-TECHNIKABEL- FIRES
14.04. 2011r

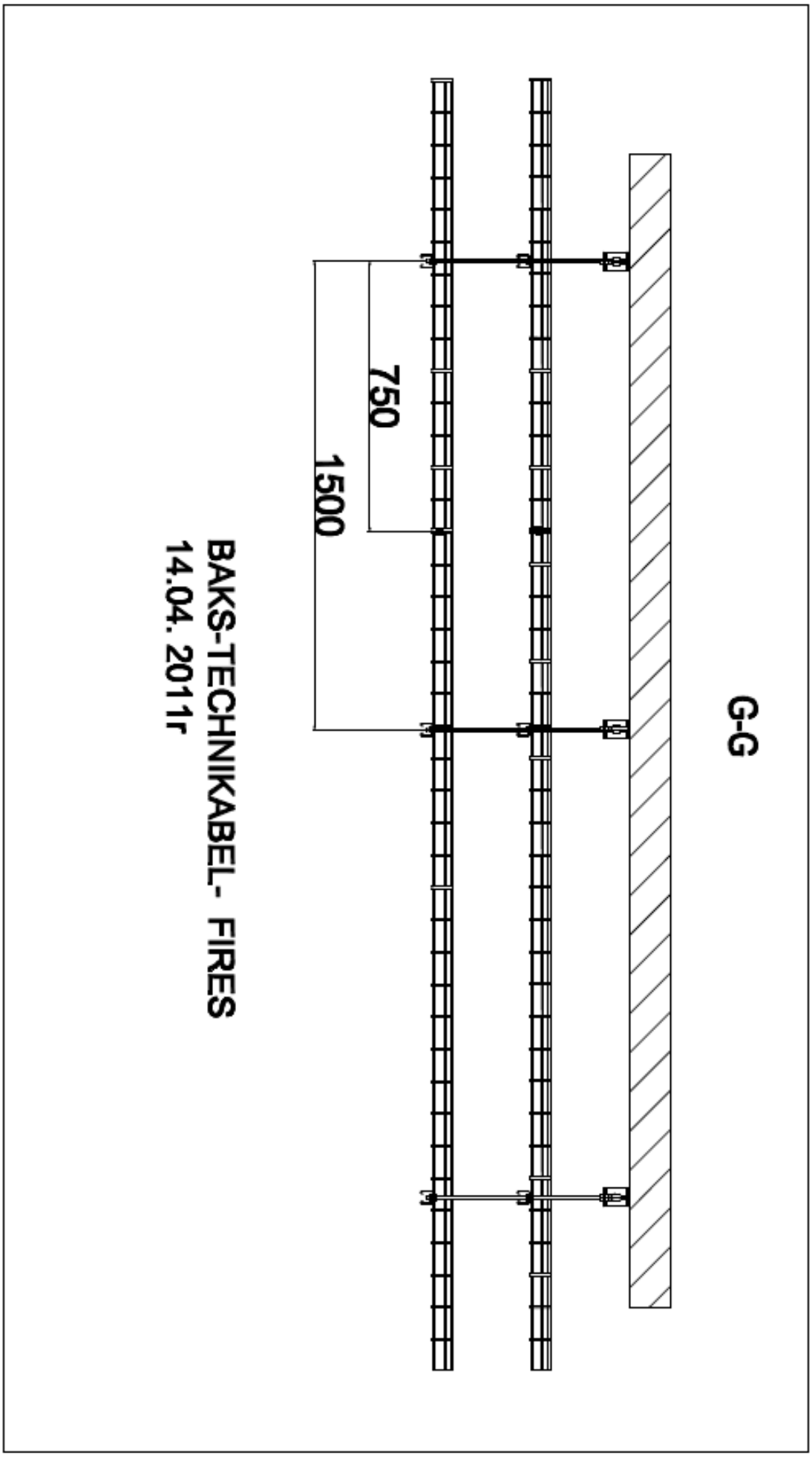

B-B
750
1500
BAKS-TECHNIKABEL- FIRES
14.04. 2011r

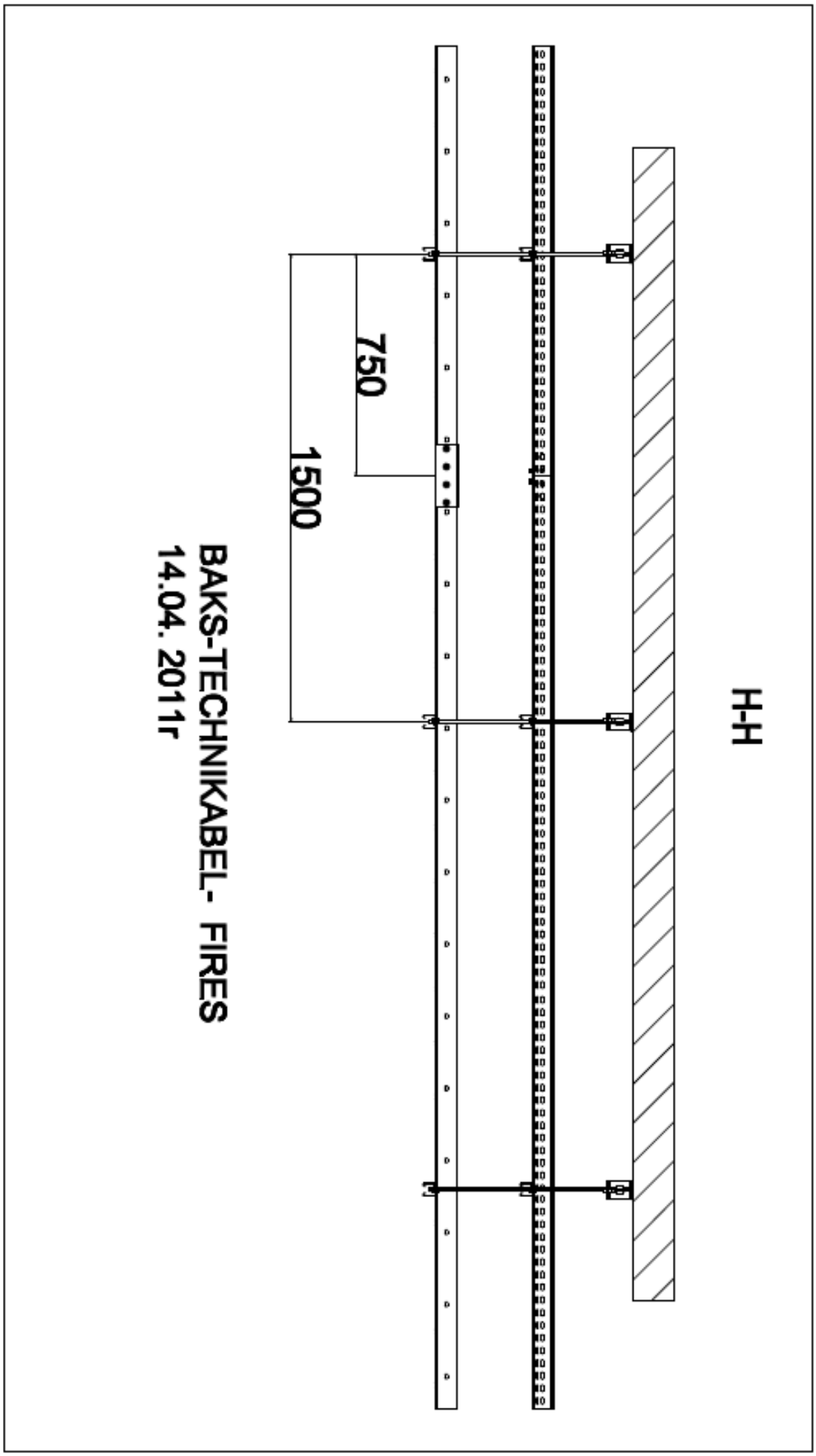

C-C
750
1500
BAKS-TECHNIKABEL- FIRES
14.04. 2011r

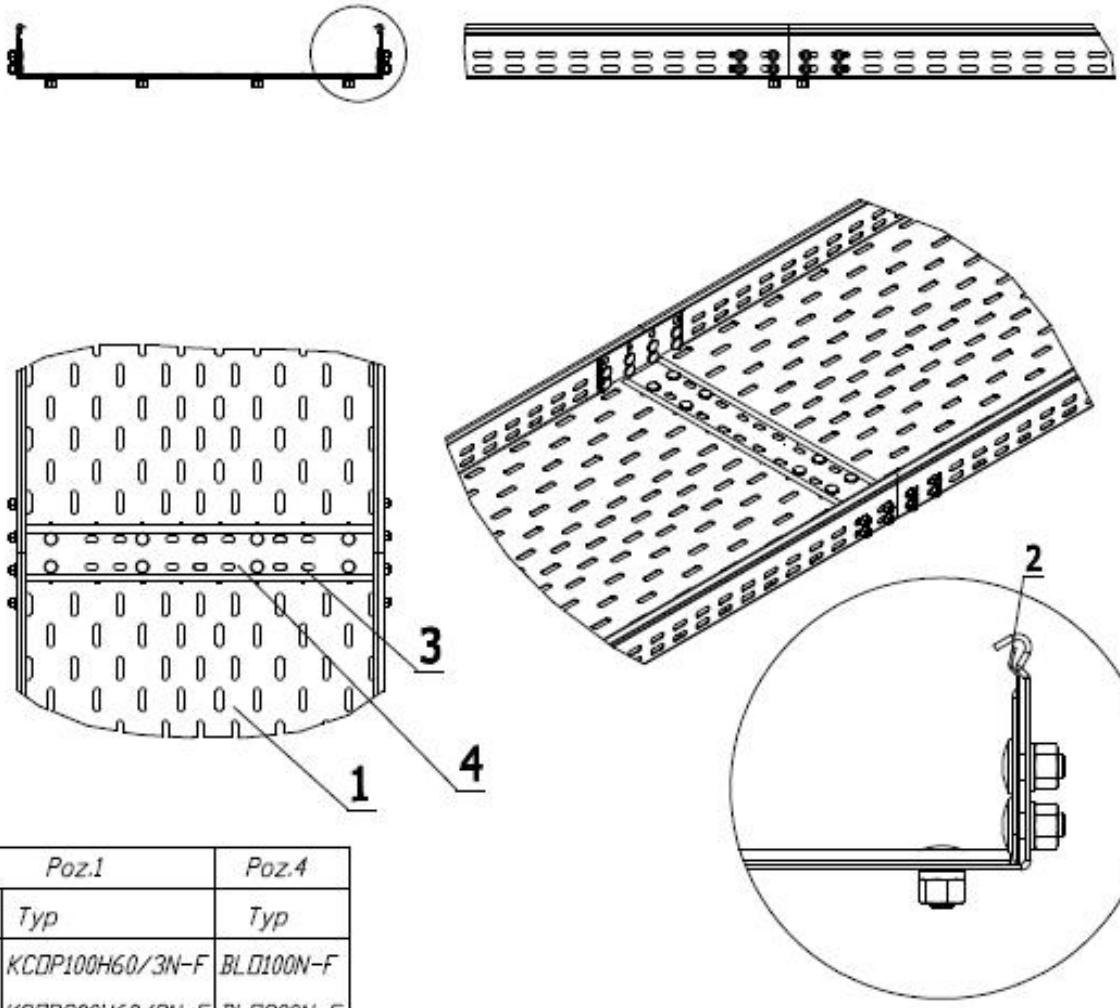

D-D
1500
600
600
BAKS-TECHNIKABEL- FIRES
14.04. 2011r


E-E
1500
750
BAKS-TECHNIKABEL- FIRES
14.04. 2011r


750
1500
F-F
BAKS-TECHNIKABEL- FIRES
14.04. 2011r


G-G
1500
750
BAKS-TECHNIKABEL- FIRES
14.04. 2011r


H-H
1500
750
BAKS-TECHNIKABEL- FIRES
14.04. 2011r



Poz.1		Poz.4
A	Typ	Typ
100	KCOP100H60/3N-F	BLO100N-F
200	KCOP200H60/3N-F	BLO200N-F
300	KCOP300H60/3N-F	BLO300N-F
400	KCOP400H60/3N-F	BLO400N-F

Ocynk ogniowy

Pos.	Nazwa	symbol	Materiał	sztuki	
4	blacha łącznikowa	BLO400N-F		1	
3	śruba	SGN M6x12-F		24	
2	łącznik	LPOPH60N-F		2	
1	koryto	KCOP400H60/3N-F		1	

Odchyłka wymiarów nietolerowanych

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

Masa [kg]

Podziałka: 7:50

Format: A4; Arkusz: 1; Arkuszy: 1

Projektował

Rysował: KSOBOLEWSKI

Sprawdził

Zatwierdził

Nazwisko | Podpis | Data

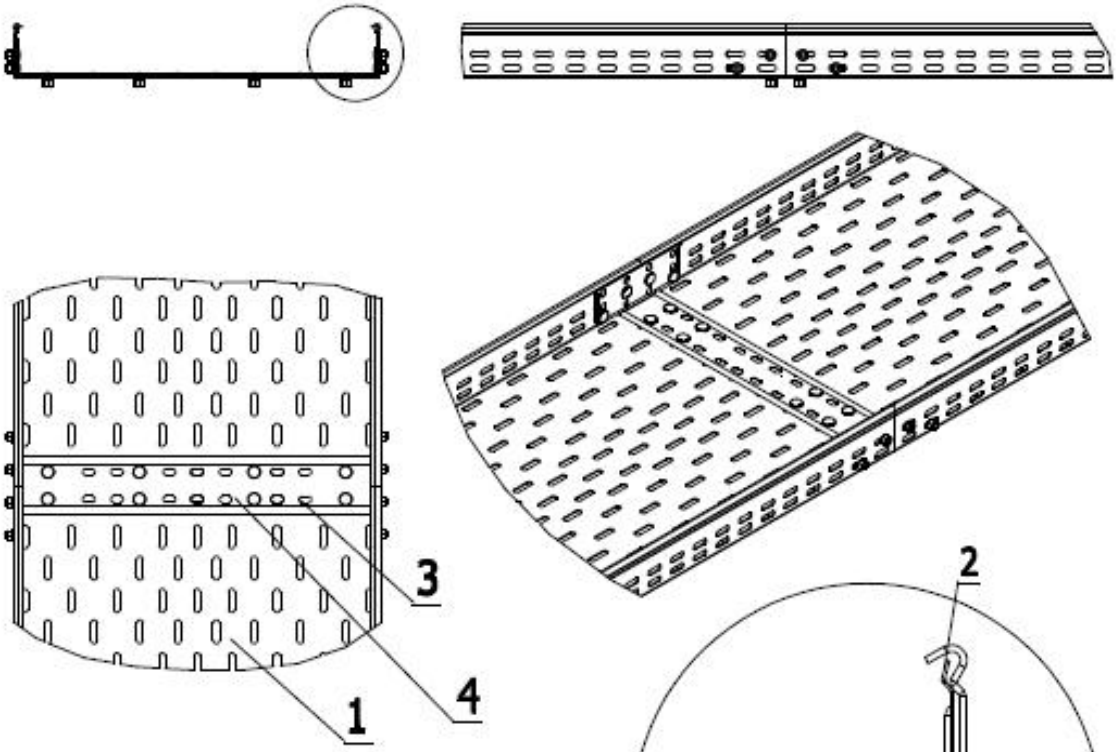
Nazwa rysunku: Połączenie KCOP400H60/3N-F

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

Lakier proszkowy poliuretanowy

Pos.	Nazwa	symbol	Materiał	sztuk	
4	blacha łącznikowa	BL□400N-L		1	
3	śruba	SGN M6x12		16	
2	łącznik	LP□PH60N-L		2	
1	koryto	KC□P400H60/3N-L		1	

Odchyłka wymiarów nietolerowanych

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

Masa (kg)

Podziałka: 7:50

Format: A4; Arkusz: 1; Arkuszy: 1

Projektował			
Rysował	JGrochowski		
Sprawdził			
Zatwierdził			

Nazwisko | Podpis | Data

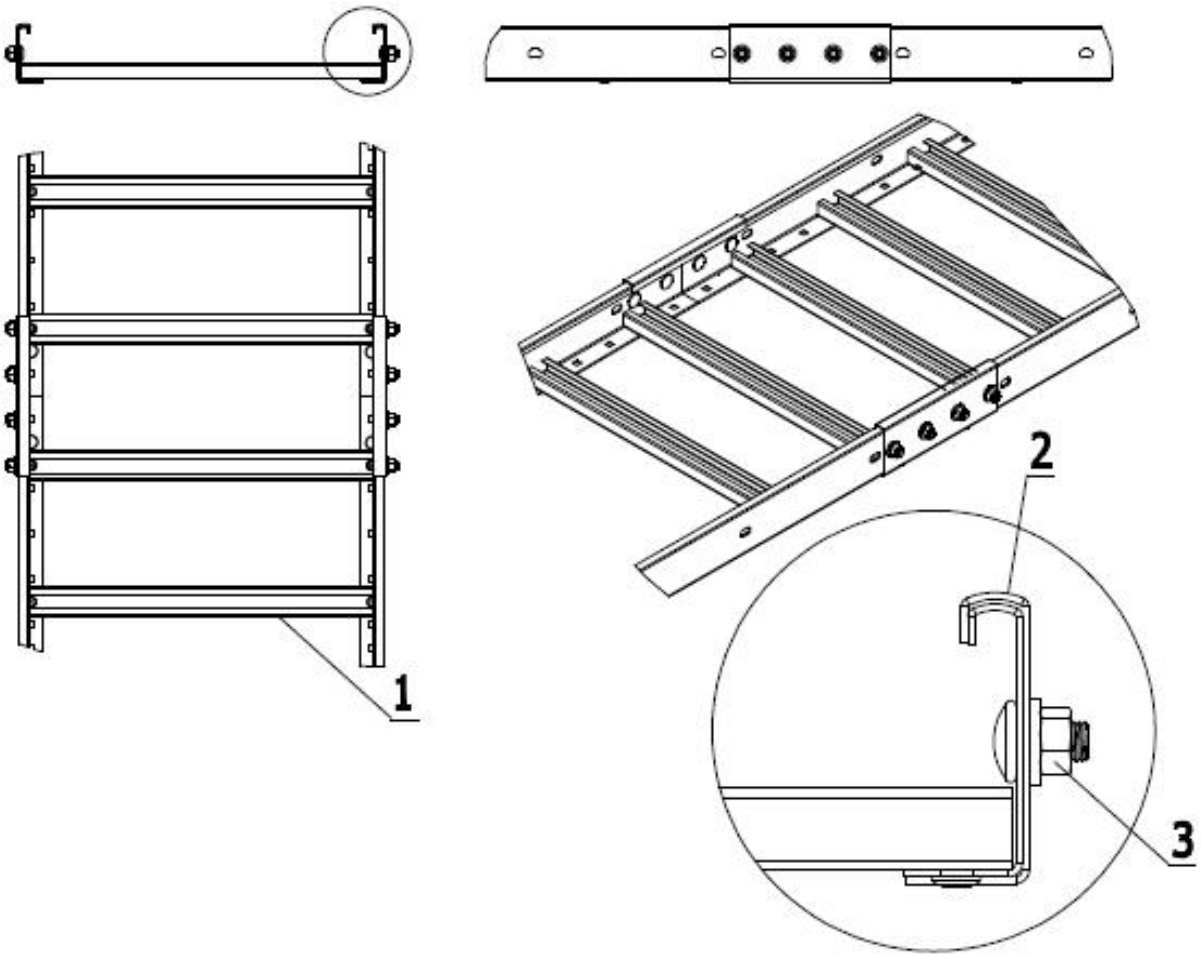
Nazwa rysunku: Połączenie KC□P400H60/3N-L

Nr programu maszynowego

Nr rysunku

Nr zmiany

Profesjonalne Systemy Tras Kablowych



Ocynk ogniowy

L.P.	Nazwa	Symbol	Materiał	szt.	Nr katalogowy
3	Śruba	SGN M8x14-F		8	
2	łącznik	LDDCH60N-F		2	
1	DRABINA	DGDP400H60/3N-F		2	

Odchyłka wymiarów nietolerowanych

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

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

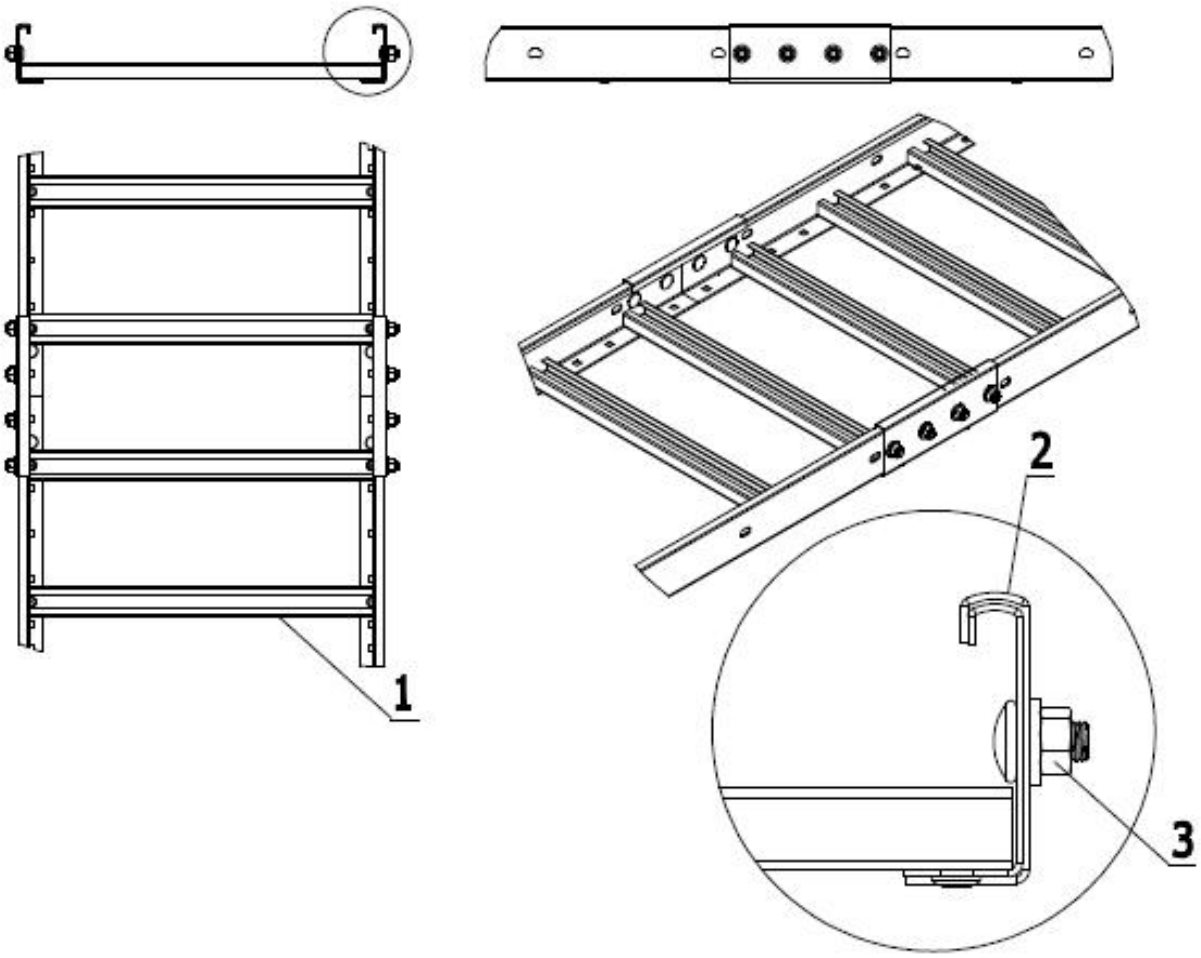
	Nazwisko	Podpis	Data
Projektował			
Rysował	P. Bieliński		
Sprawdził			
Zatwierdził			

Nazwa rysunku: Połączenie DGDP400H60/3N-F

Nr programu maszynowego | Nr zmiany

Nr rysunku

Profesjonalne Systemy Tras Kablowych



Lakier proszkowy poliuretanowy

L.P.	Nazwa	Symbol	Materiał	szt.	Nr katalogowy
3	Śruba	SGN M8x14		8	
2	łącznik	LDDCH60N-L		2	
1	DRABINA	DGDP400H60/3N-L		2	

Odchyłka wymiarów nietolerowanych

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

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

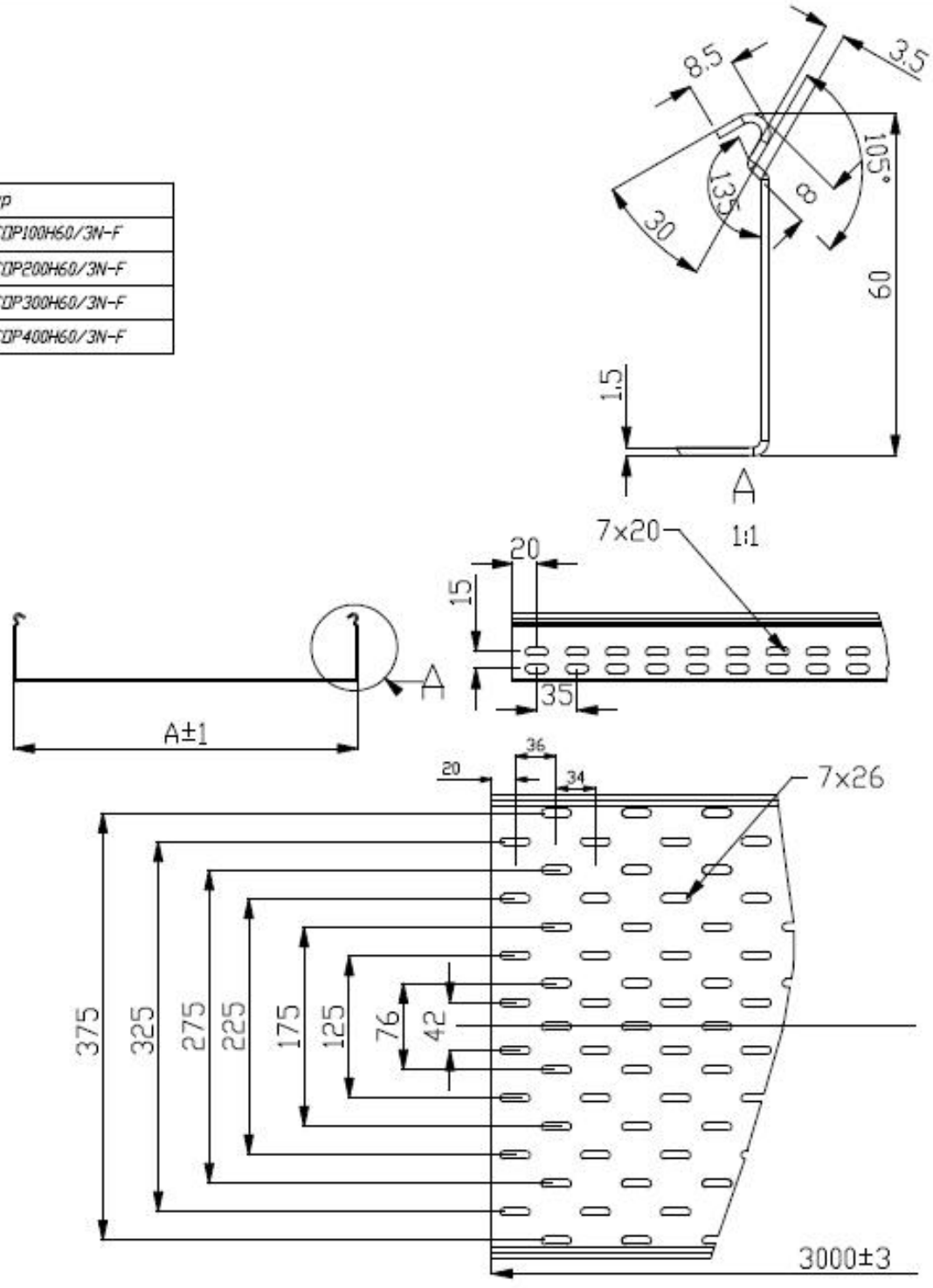
Projektował | Rysował: P. Bieliński | Sprawdził | Zatwierdził | Nazwisko | Podpis | Data

Nazwa rysunku: Połączenie DGDP400H60/3N-L

Nr programu maszynowego | Nr rysunku | Nr zmiany

Profesjonalne Systemy Tras Kablowych

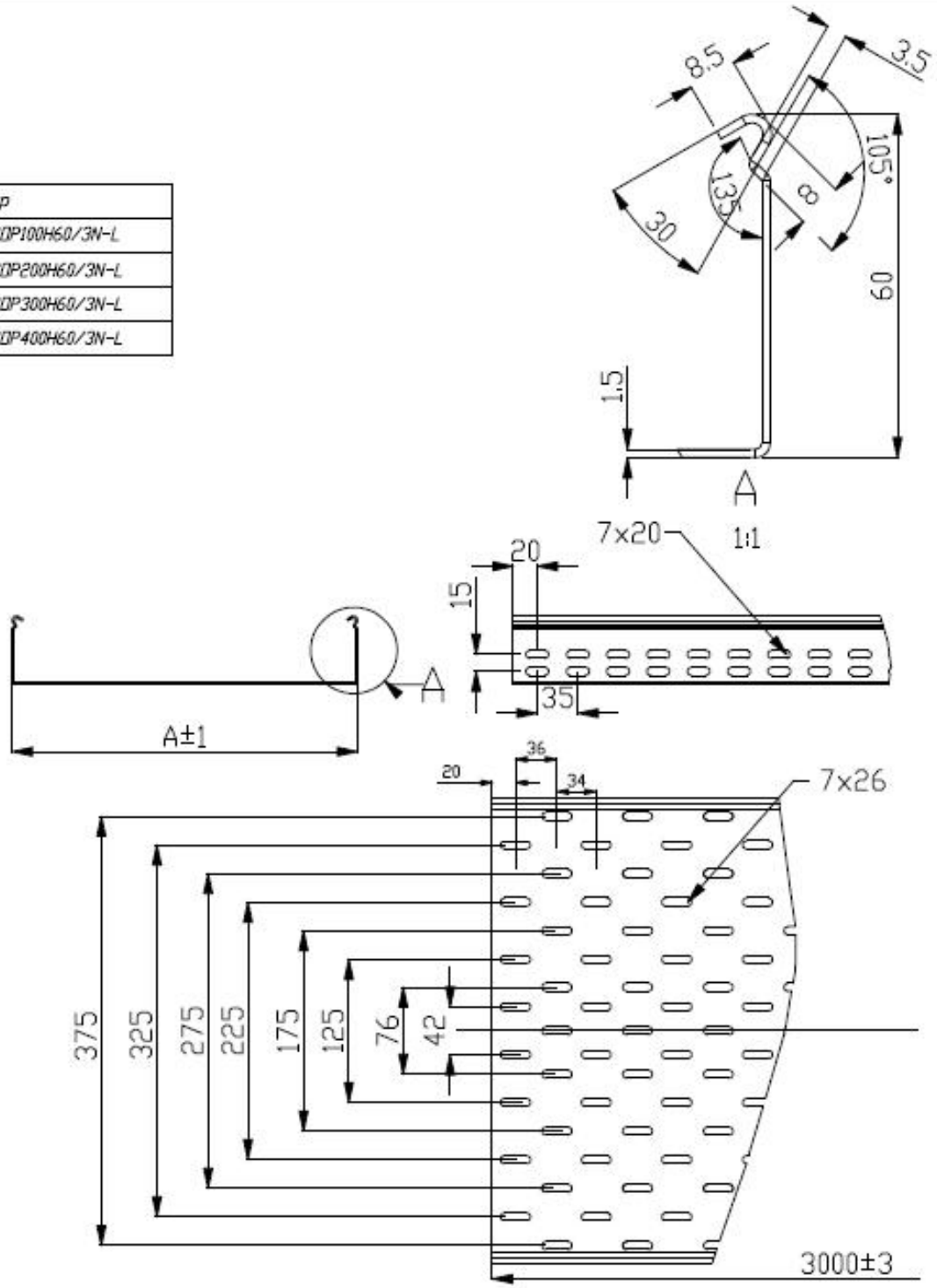
A	Typ
100	KCOP100H60/3N-F
200	KCOP200H60/3N-F
300	KCOP300H60/3N-F
400	KCOP400H60/3N-F



Ocynk ogniowy

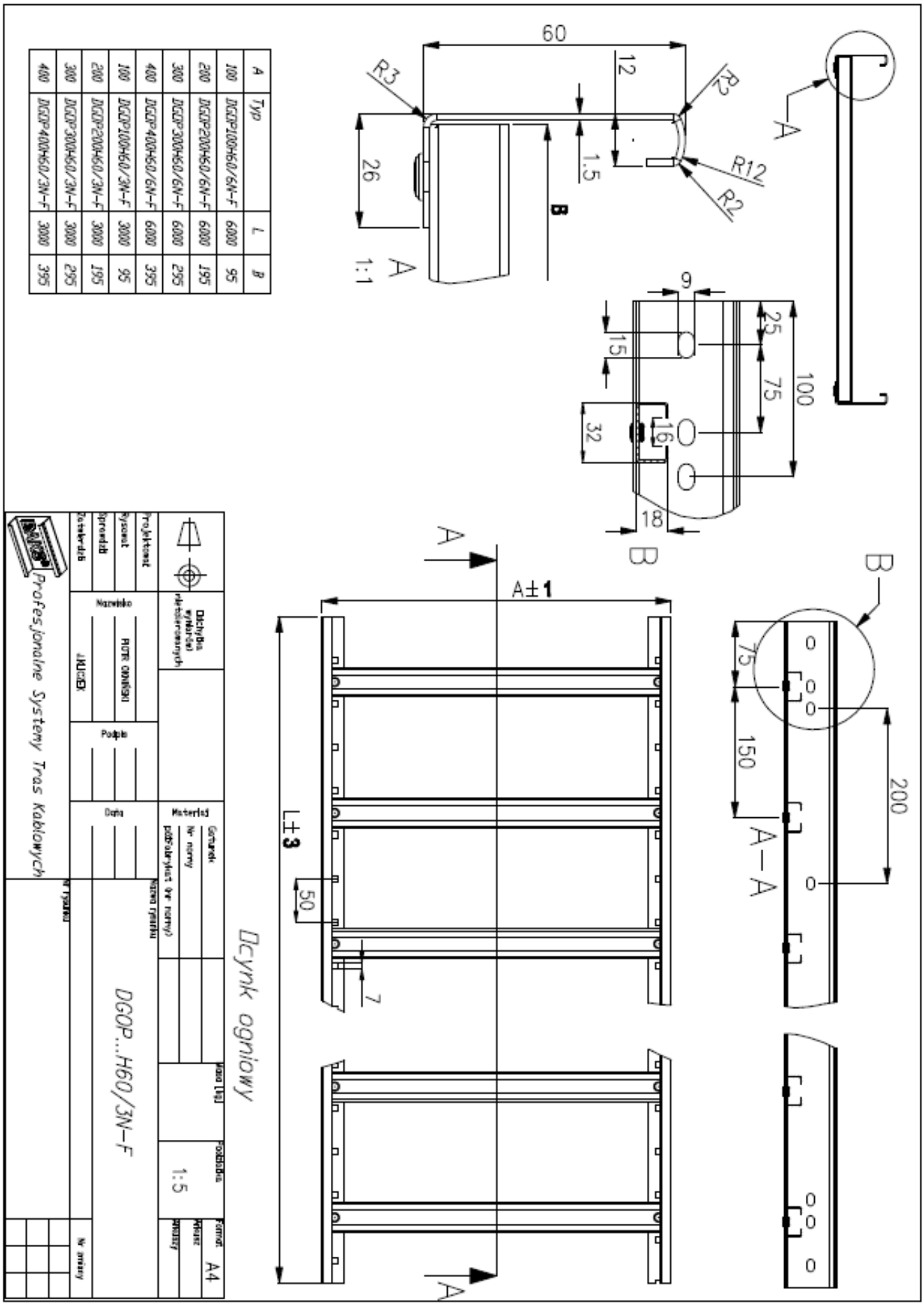
	Odchyłka wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka 1:5	Format A4
			Nr normy				Arkusz
			półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku: KCOP400H60/3N-F			
Rysował	M.SOBOLEWSKI						
Sprawdził	T.WŁODARCZYK						
Zatwierdził	J.KLOCZEK						Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku			

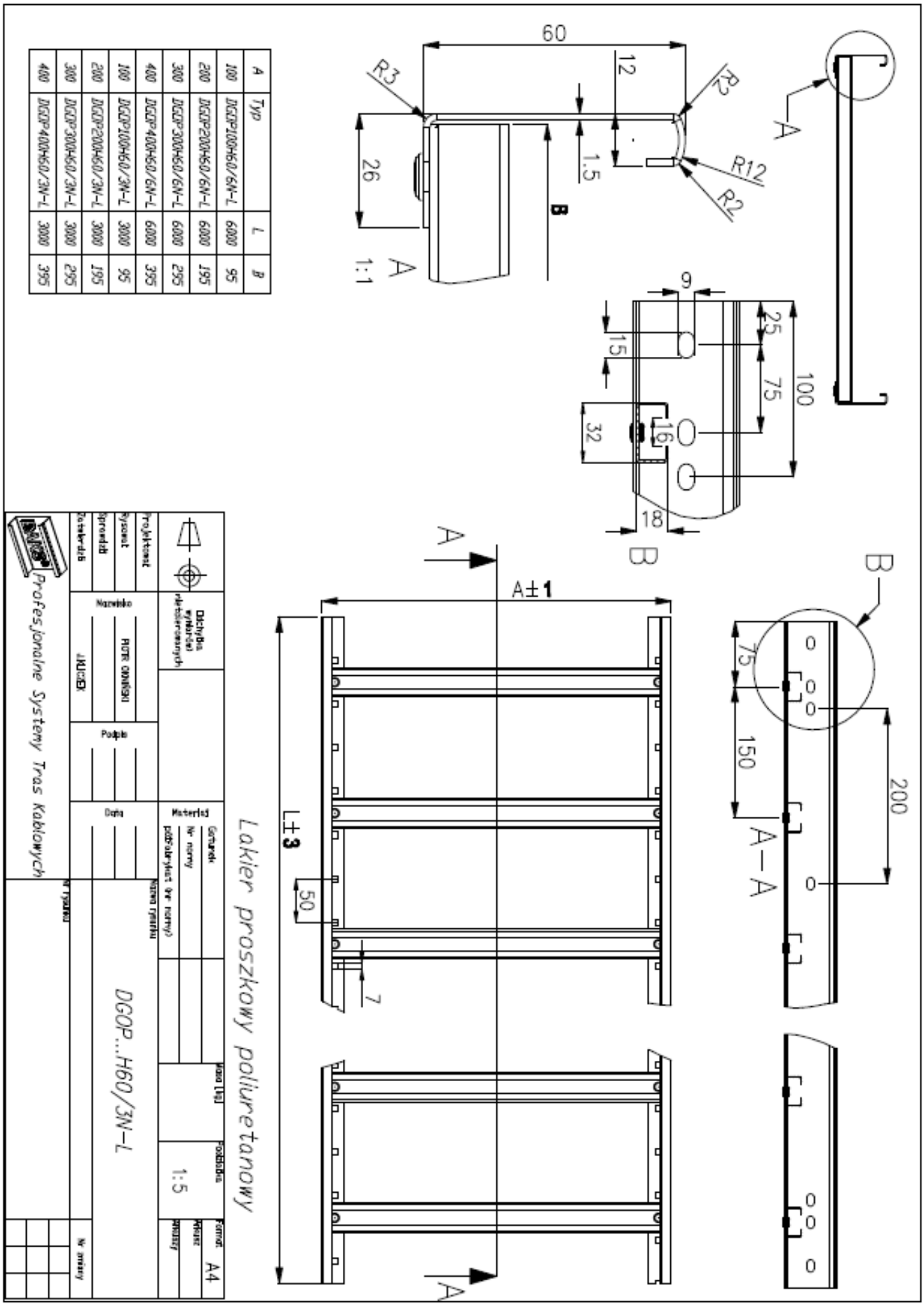
A	Typ
100	KCOP100H60/3N-L
200	KCOP200H60/3N-L
300	KCOP300H60/3N-L
400	KCOP400H60/3N-L



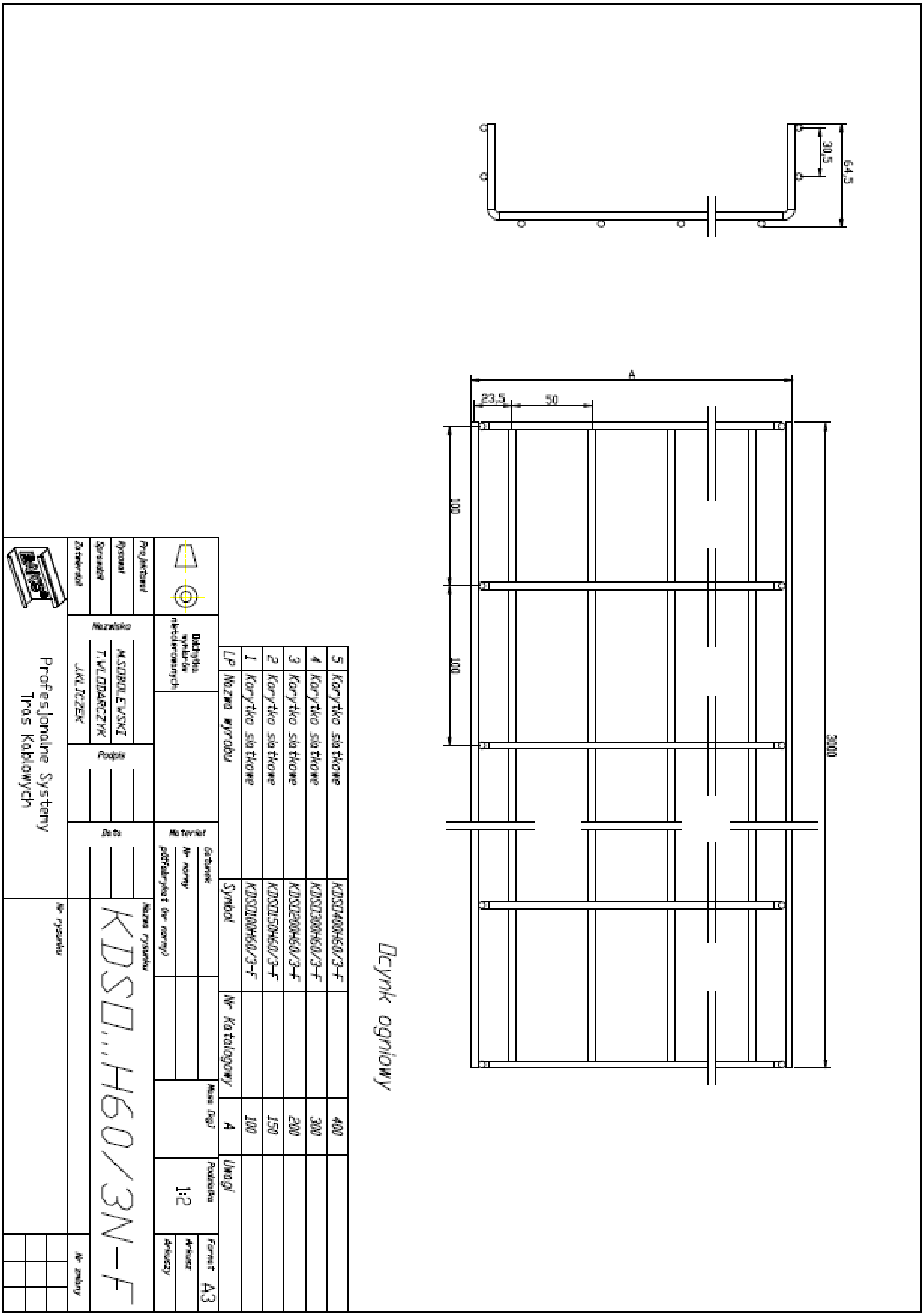
Lakier proszkowy poliuretanowy

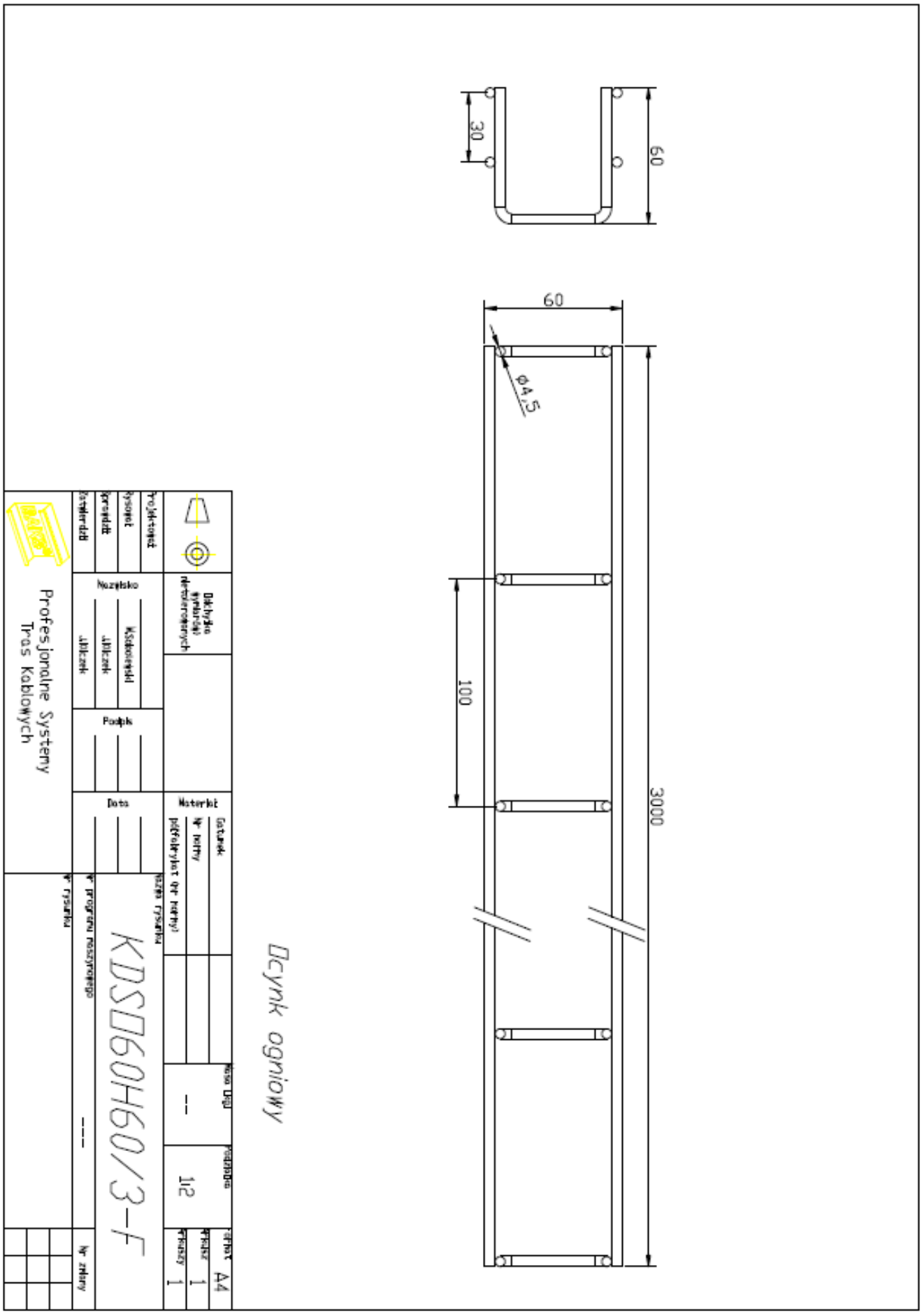
Odchyłka wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka 1:5	Format A4
		Nr normy				Arkusz
		półfabrykat (nr normy)				Arkuszy
Projektował		Nazwisko	Podpis	Data	Nazwa rysunku: KCOP400H60/3N-L	
Rysował		M.SOBOLEWSKI				
Sprawdził		T.WŁODARCZYK				
Zatwierdził		J.KŁOCZEK				Nr zmiany
Profesjonalne Systemy Tras Kablowych					Nr rysunku	

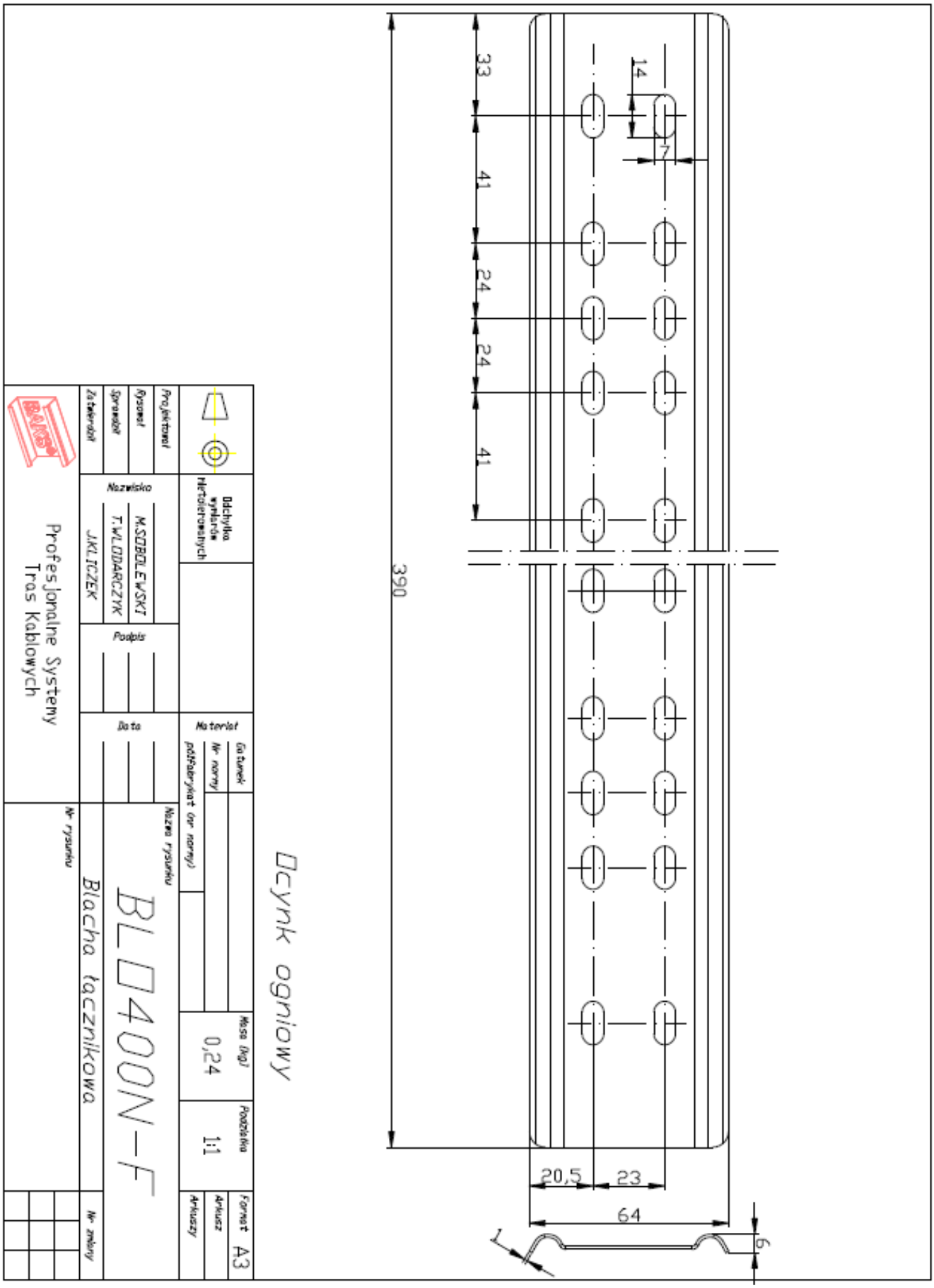

A
Typ
L
B
100
DGOP100H60/6N-F
6000
95
200
DGOP200H60/6N-F
6000
195
300
DGOP300H60/6N-F
6000
295
400
DGOP400H60/6N-F
6000
395
100
DGOP100H60/3N-F
3000
95
200
DGOP200H60/3N-F
3000
195
300
DGOP300H60/3N-F
3000
295
400
DGOP400H60/3N-F
3000
395
60
12
R3
R2
R12
R2
1.5
26
B
A
1:1
9
25
75
100
15
32
16
18
B
A
A±1
L±3
50
7
A
B
75
150
200
A–A
0
Ocynk ogniowy
Profesjonalne Systemy Tras Kablowych
DGOP...H60/3N-F
1:5
A4

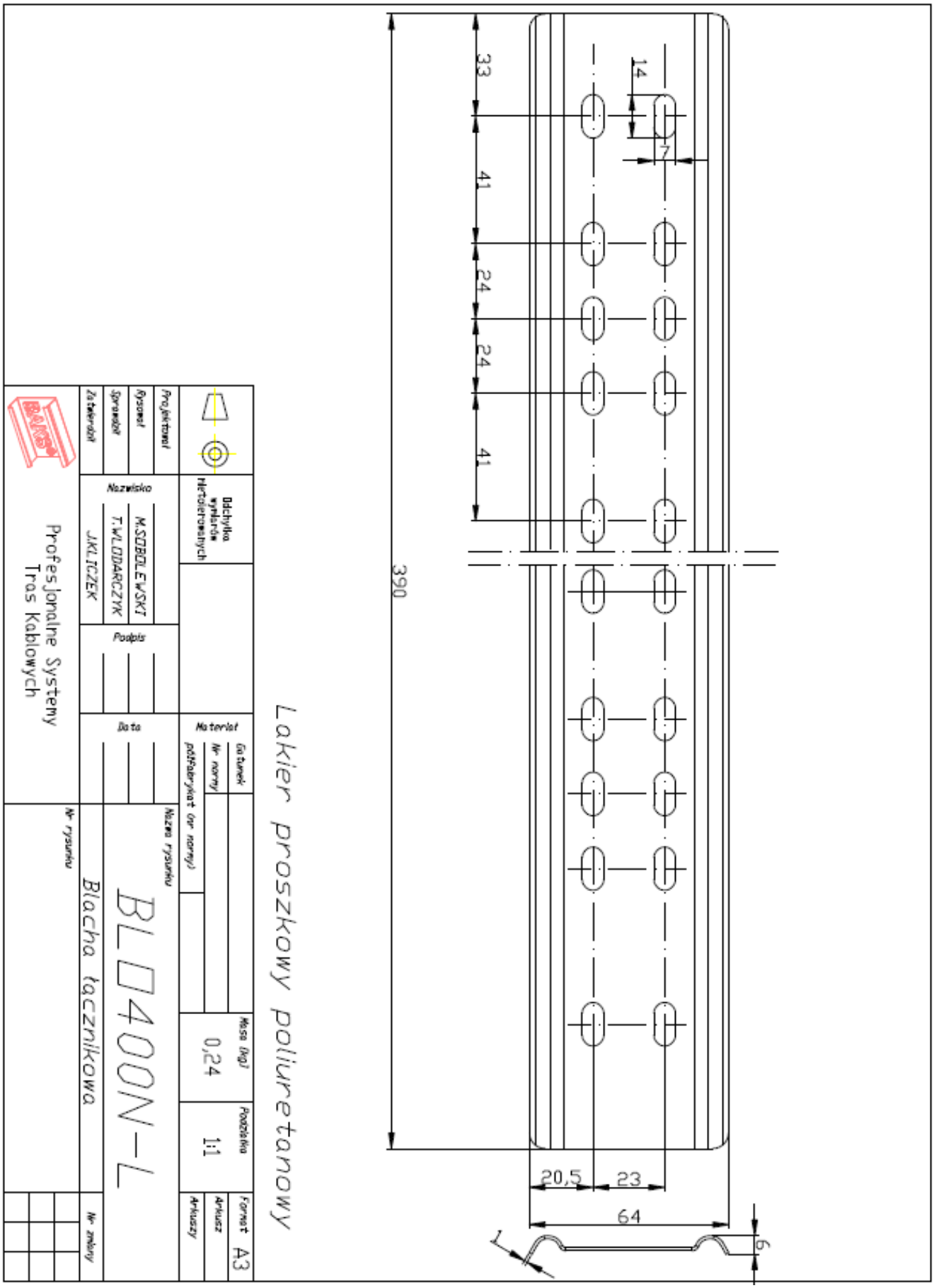


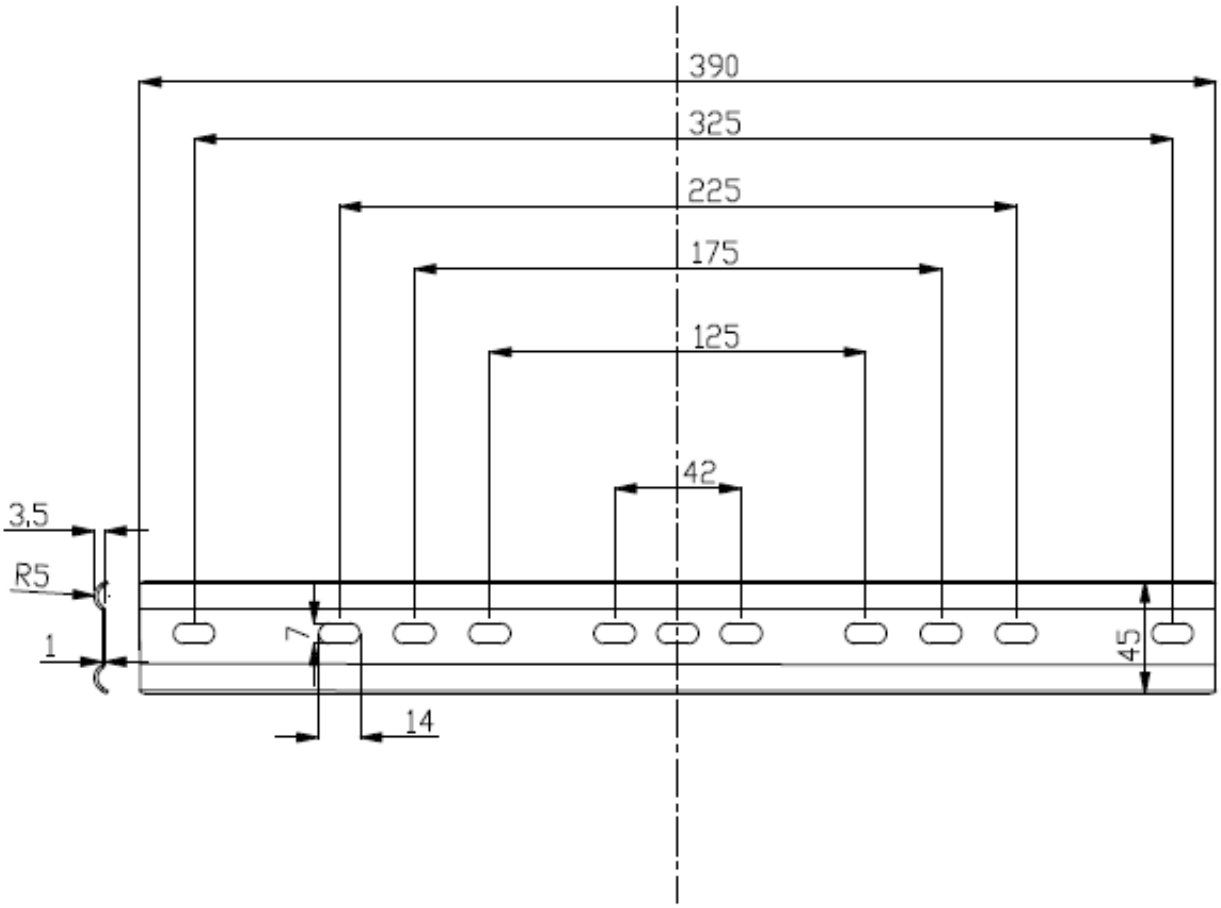
A	Typ	L	B
100	DGOP100H60/6N-L	6000	95
200	DGOP200H60/6N-L	6000	195
300	DGOP300H60/6N-L	6000	295
400	DGOP400H60/6N-L	6000	395
100	DGOP100H60/3N-L	3000	95
200	DGOP200H60/3N-L	3000	195
300	DGOP300H60/3N-L	3000	295
400	DGOP400H60/3N-L	3000	395


64,5
30,5
3000
A
23,5
50
100
100
Ocynk ogniowy
5 Korytko siatkowe KDSO400H60/3-F 400
4 Korytko siatkowe KDSO300H60/3-F 300
3 Korytko siatkowe KDSO200H60/3-F 200
2 Korytko siatkowe KDSO150H60/3-F 150
1 Korytko siatkowe KDSO100H60/3-F 100
LP Nazwa wyrobu Symbol Nr Katalogowy A Uwagi
Odchyłka wymiarów nietolerowanych
Materiał Gatunek
Nr normy
półfabrykat (nr normy)
Masa [kg]
Podziałka 1:2
Format A3
Arkusz
Arkuszy
Projektował
Rysował
Sprawdził
Zatwierdził
Nazwisko
M.SOBOLEWSKI
T.WLODARCZYK
J.KLICZEK
Podpis
Data
Nazwa rysunku
KDSO..H60/3N-F
Nr zmiany
Nr rysunku
Profesjonalne Systemy Tras Kablowych


30
60
60
ø4,5
100
3000
Ocynk ogniowy
Profesjonalne Systemy
Tras Kablowych
KDSO60H60/3-F
A4
1
1
12
--


Profesjonalne Systemy
Tras Kablowych
Odchyłka wymiarów nietolerowanych
Projektował
Rysował
Sprawdził
Zatwierdził
Nazwisko
M.SOBOLEWSKI
T.WŁODARCZYK
J.KLICZEK
Podpis
Data
Materiał
Gatunek
Nr normy
półfabrykat (nr normy)
Masa (kg)
0,24
Podziałka
1:1
Format
A3
Arkusz
Arkuszy
Nr zmiany
Nazwa rysunku
BL 400N-F
Blacha łączникowa
Nr rysunku
Dcynk ogniowy
390
33
41
24
24
41
14
7
20,5
23
64
6

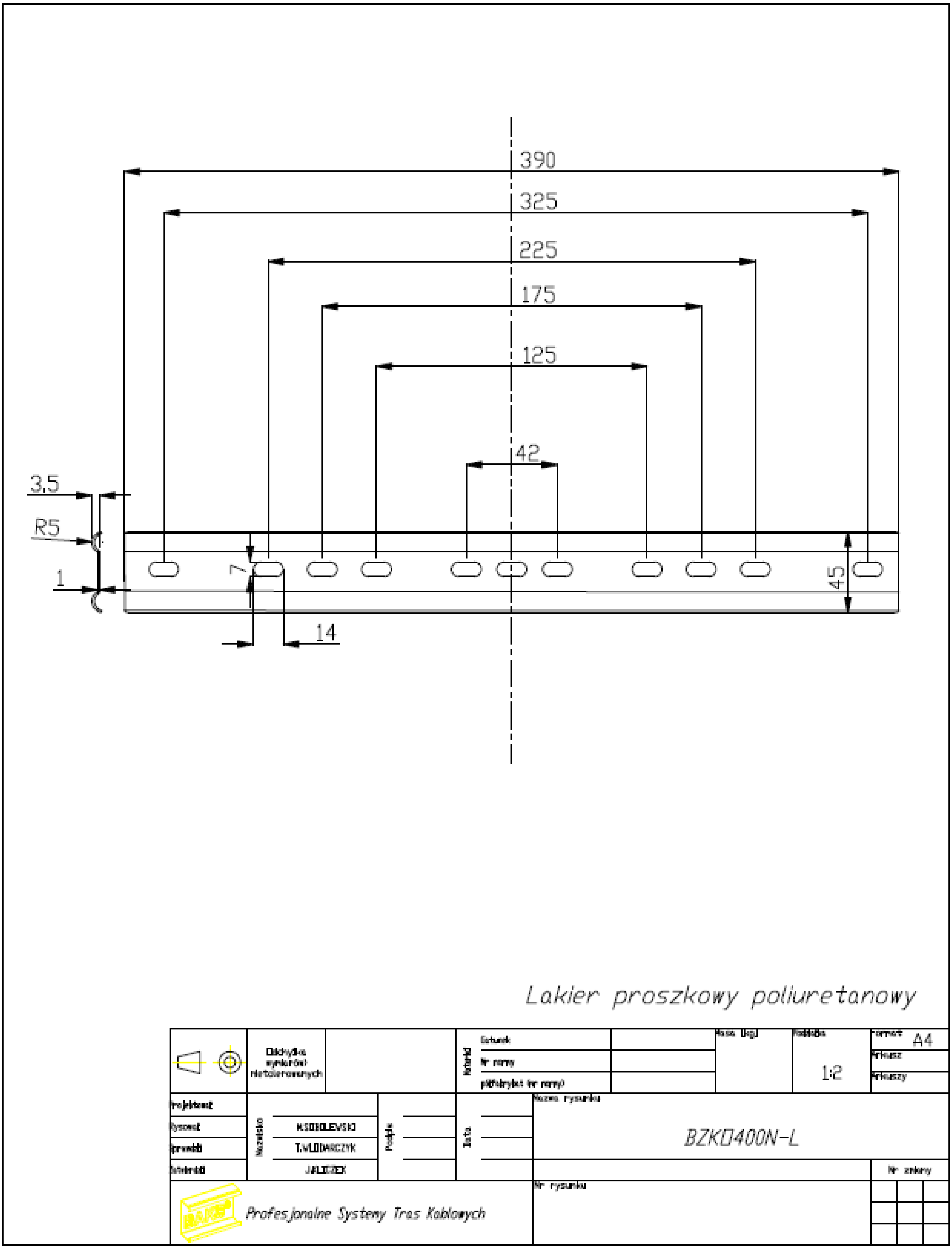

33
14
7
41
24
24
41
390
20,5
23
64
6
Lakier proszkowy poliuretanowy
Profesjonalne Systemy Tras Kablowych
Projektował
Rysował
Sprawdził
Zatwierdził
Nazwisko
M.SOBOLEWSKI
T.WLODARCZYK
J.KLICZEK
Podpis
Data
Odchyłka wymiarów nietolerowanych
Materiał
Gatunek
Nr normy
półfabrykat (nr normy)
Masa (kg)
0,24
Podziałka
1:1
Format
A3
Arkusz
Arkuszy
Nazwa rysunku
BL□400N-L
Blacha łącznikowa
Nr rysunku
Nr zmiany

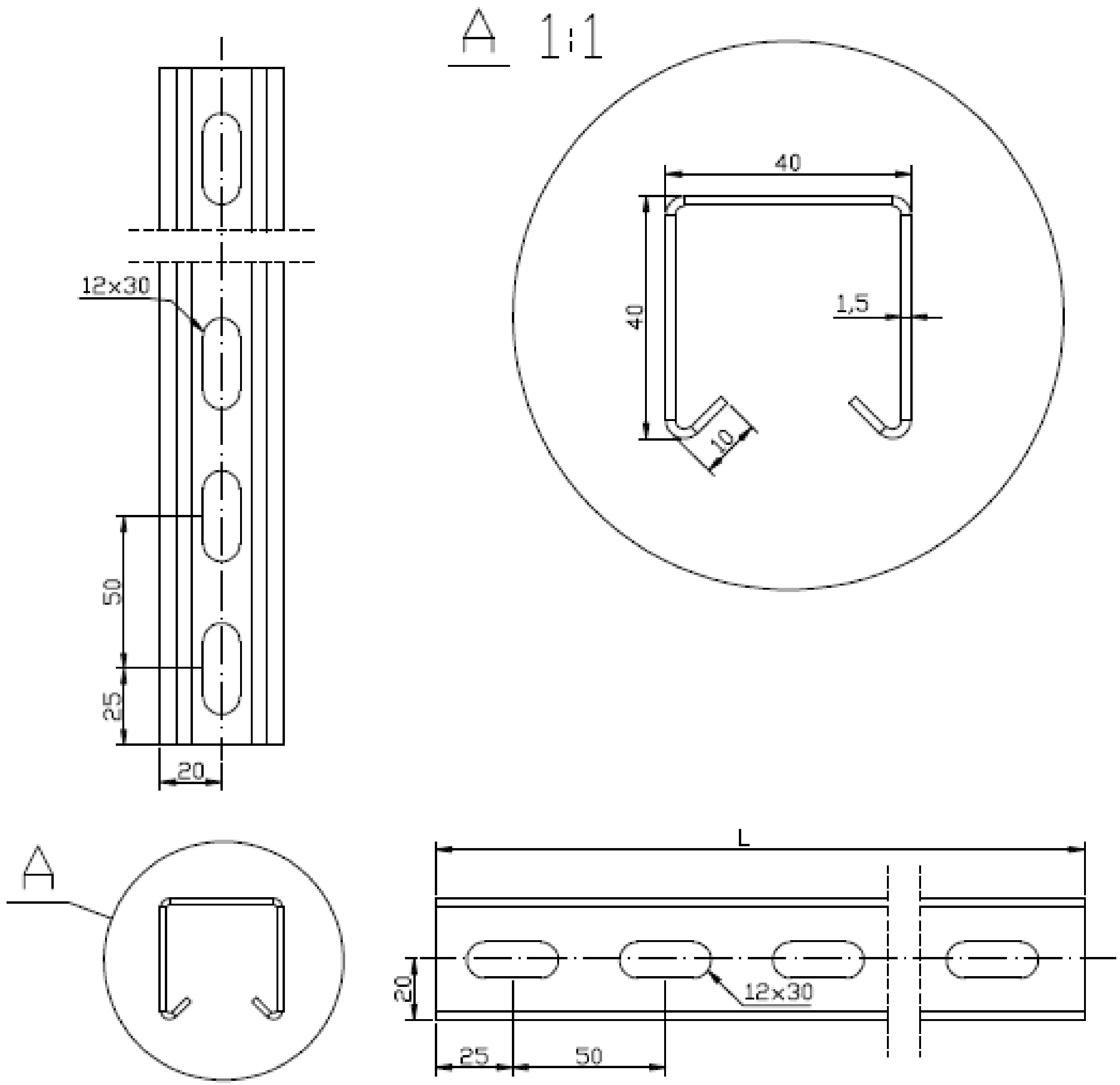


Ocynk ogniowy

	Elektryka wymiarów nietolerowanych		Materiał: Gatunek / Nr normy / półfabrykat (nr normy)		Masa [kg]	Podziałka 1:2	Format A4 / Arkusz / Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku			
Rysował	M.SOBOLEWSKI			BZKO400N-F			
Sprawdził	T.WŁODARCZYK						Nr zmiany
Zatwierdził	JA[illegible]EK			Nr rysunku			

Profesjonalne Systemy Tras Kablowych


390
325
225
175
125
42
3,5
R5
1
7
14
45
Lakier proszkowy poliuretanowy
Nr normy
Masa [kg]
A4
1:2
Arkusz
Arkuszy
Nazwa rysunku
M.SOBOLEWSKI
T.WLODARCZYK
BZKO400N-L
Nr zmiany
Nr rysunku
Profesjonalne Systemy Tras Kablowych



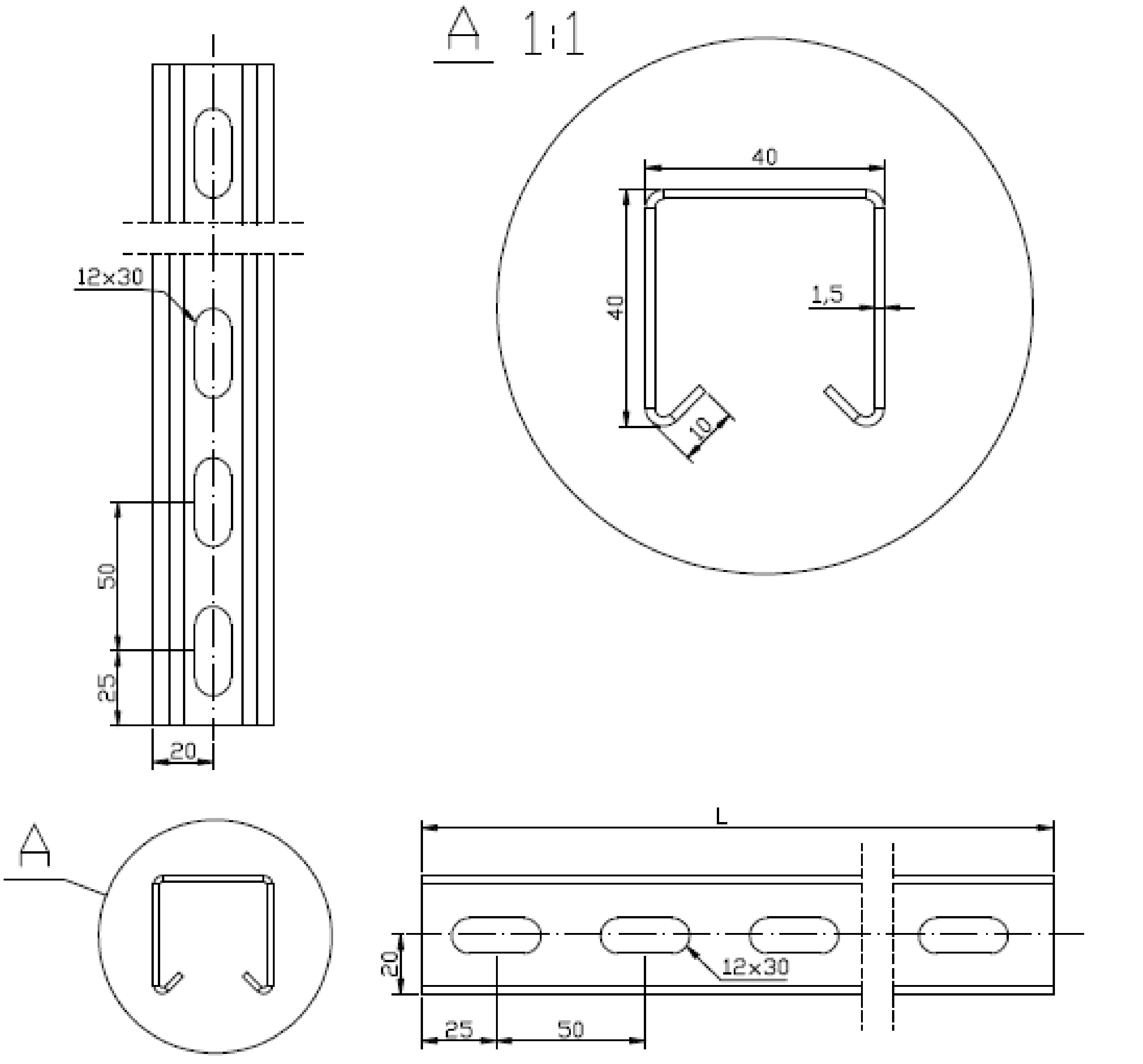
Ocynk ogniowy

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

Odchyłki wymiarów nietolerowanych	Materiał: Gatunek / Nr normy / półfabrykat (nr normy) —	Masa [kg] ---	Podziałka 1:2	Format A4; Arkusz —; Arkuszy —
Projektował				
Rysował	Nazwisko: M.Sobolewski	Podpis	Data	Nazwa rysunku: CW□P40H40/...N-F
Sprawdził	J.Kilczek			
Zatwierdził	J.Kilczek			Nr zmiany

Profesjonalne Systemy Tras Kablowych

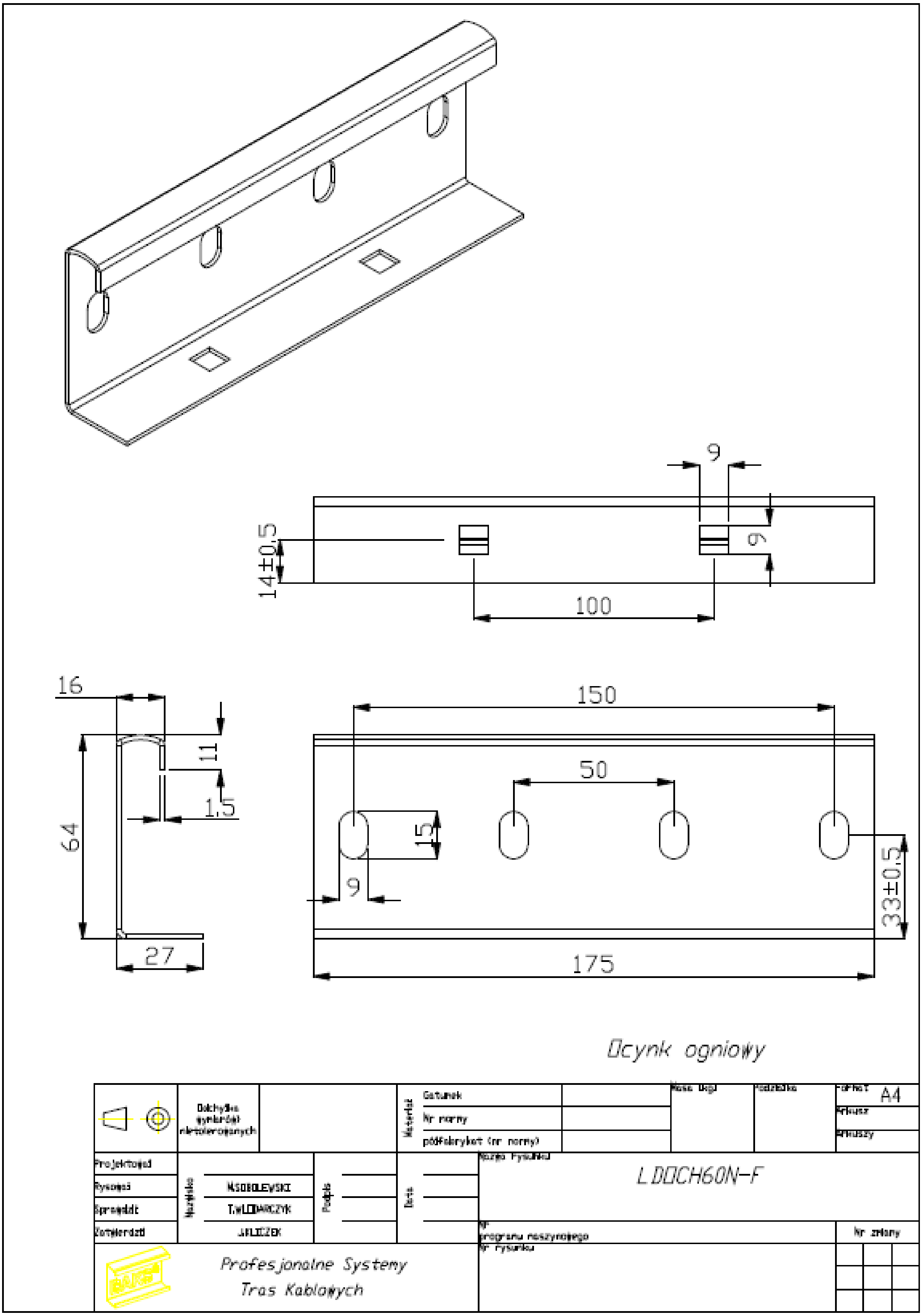
Nr rysunku

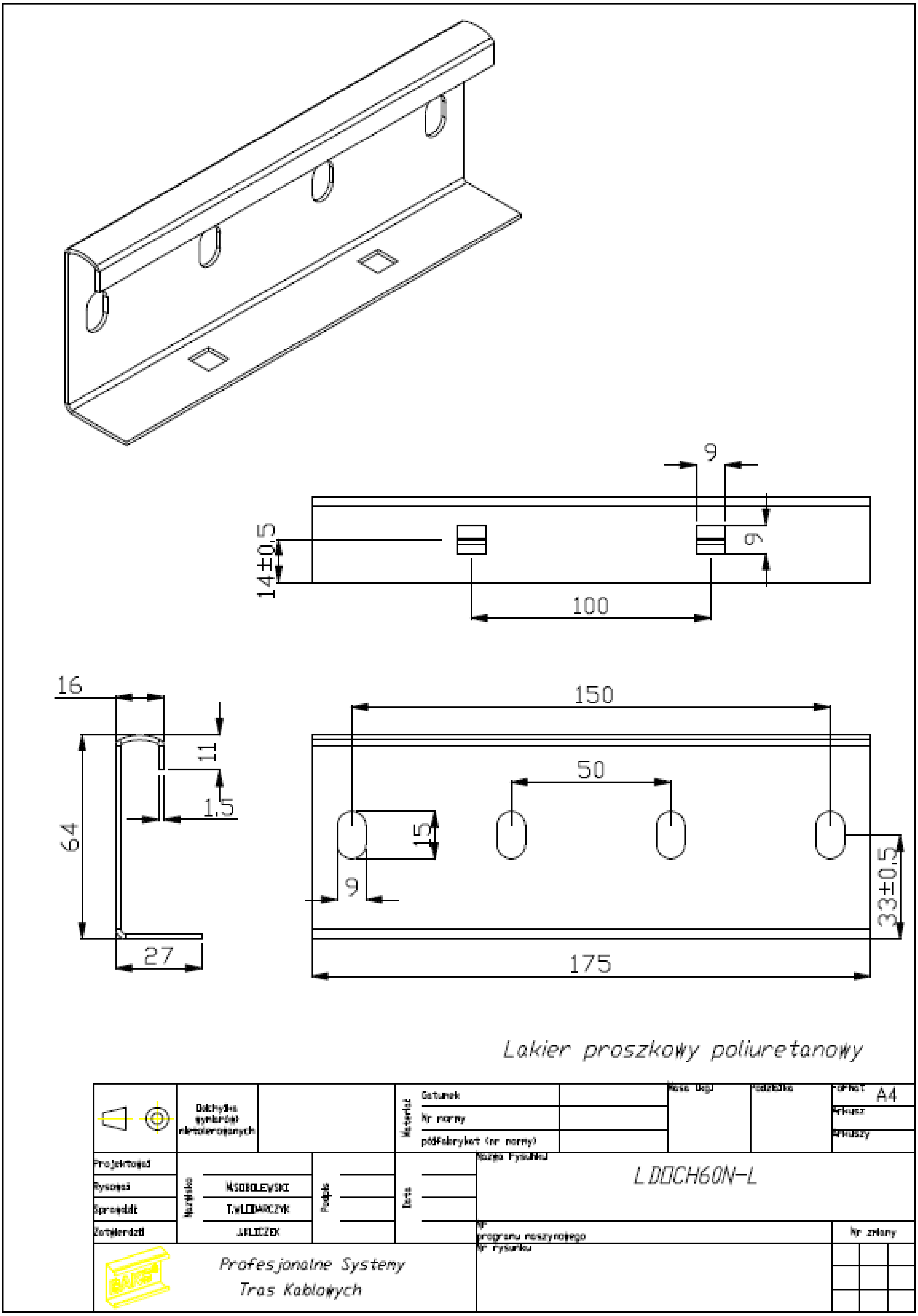


Lakier proszkowy poliuretanowy

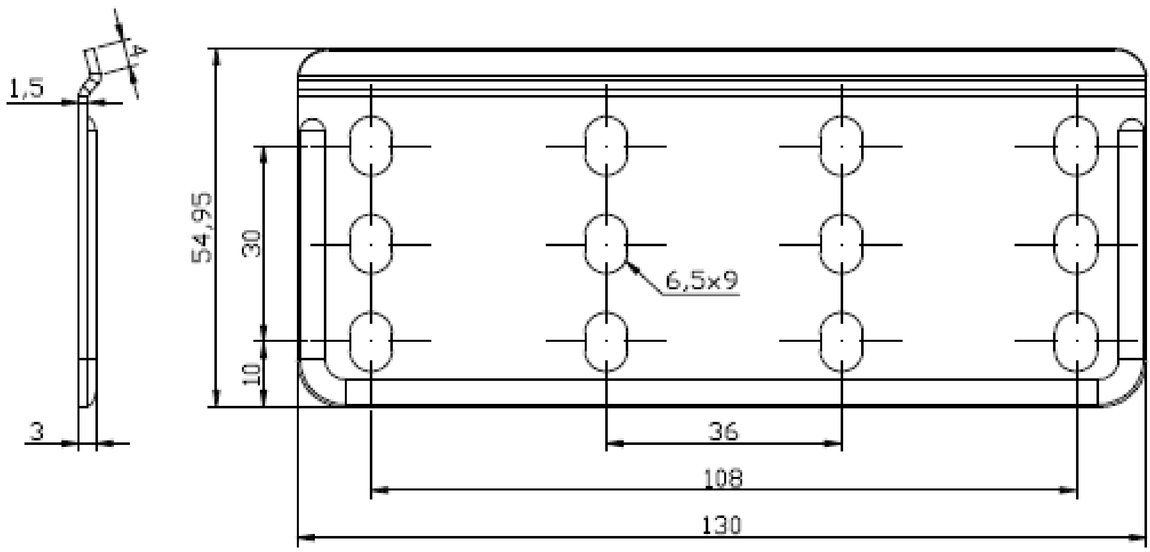
LP	Nazwa wyrobu	Symbol	Nr Katalogowy	L [mm]	Masa [kg]
5	Ceownik wzmocniony	CW□P40H40/ 2-L		2000	3,50
4	Ceownik wzmocniony	CW□P40H40/05-L		500	0,88
3	Ceownik wzmocniony	CW□P40H40/04-L		400	0,70
2	Ceownik wzmocniony	CW□P40H40/03-L		300	0,53
1	Ceownik wzmocniony	CW□P40H40/02-L		200	0,35

Odchyłki wymiarów nietolerowanych	Materiał: Gatunek / Nr normy / półfabrykat (nr normy) —	Masa [kg] ---	Podziałka 1:2
Format A4	Arkusz —	Arkuszy —	
Projektował			
Rysował	Nazwisko M.Sobolewski	Podpis	Data
Sprawdził	J.Kilczek		
Zatwierdził	J.Kilczek		
Nazwa rysunku	CW□P40H40/...N-L	Nr zmiany	
Profesjonalne Systemy Tras Kablowych	Nr rysunku		


9
14±0,5
9
100
16
150
11
1,5
50
64
15
9
33±0,5
27
175
Ocynk ogniowy
Gatunek
Nr normy
półfabrykat (nr normy)
Masa (kg)
Podziałka
Format A4
Arkusz
Arkuszy
Projektował
Rysował
Sprawdził
Zatwierdził
M.SOBOLEWSKI
T.WLODARCZYK
J.FLICZEK
Podpis
Data
Nazwa rysunku
LDOCH60N-F
Nr programu maszynowego
Nr rysunku
Nr zmiany
Profesjonalne Systemy
Tras Kablowych

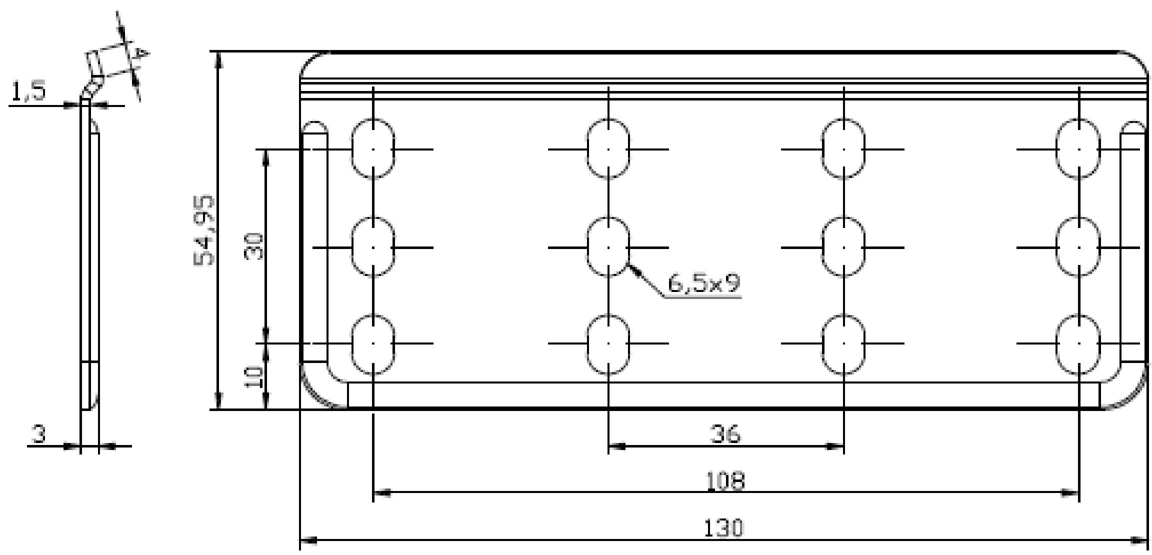


9
14±0,5
9
100
16
11
1,5
64
27
150
50
15
9
33±0,5
175
Lakier proszkowy poliuretanowy
A4
LDOCH60N-L
Profesjonalne Systemy
Tras Kablowych



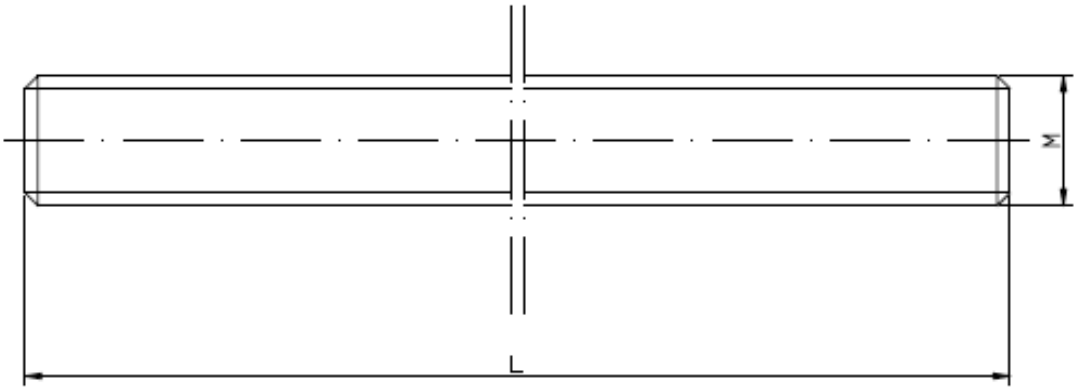
Ocynk ogniowy

	Dokładność wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka	Format A4
				Nr normy			1:1	Arkusz
				półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko		Podpis		Data	Nazwa rysunku		
Rysował		M.SOBOLEWSKI				LPOPH60N-F		
Sprawdził		T.WLODARCZYK						
Zatwierdził		J.KLICZEK						Nr zmiany
Profesjonalne Systemy Tras Kablowych						Nr rysunku		



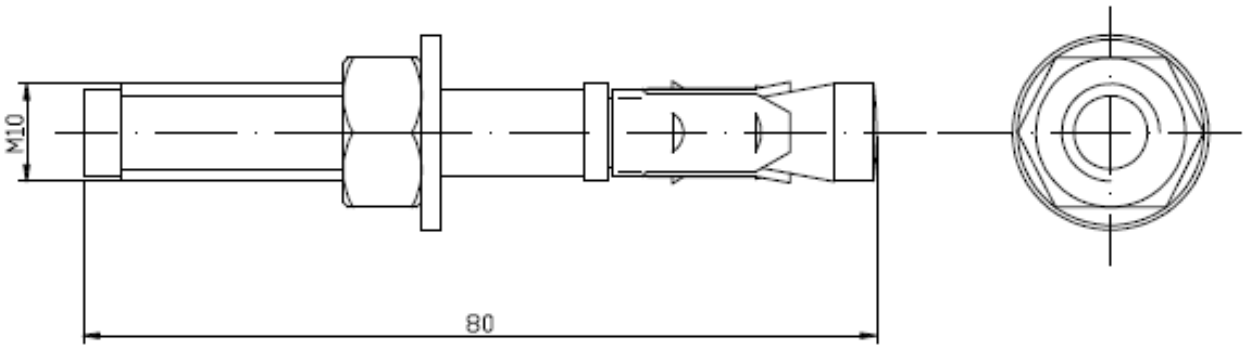
Lakier proszkowy poliuretanowy

Dokładność wymiarów nietolerowanych		Materiał: Gatunek / Nr normy / półfabrykat (nr normy)	Masa [kg]	Podziałka 1:1	Format A4 / Arkusz / Arkuszy
Projektował			Nazwa rysunku		
Rysował	Nazwisko: M.SOBOLEWSKI	Podpis	Data	LPOPH60N-L	
Sprawdził	T.WLODARCZYK				
Zatwierdził	J.KLICZEK				Nr zmiany
BAKS	Profesjonalne Systemy Tras Kablowych		Nr rysunku		

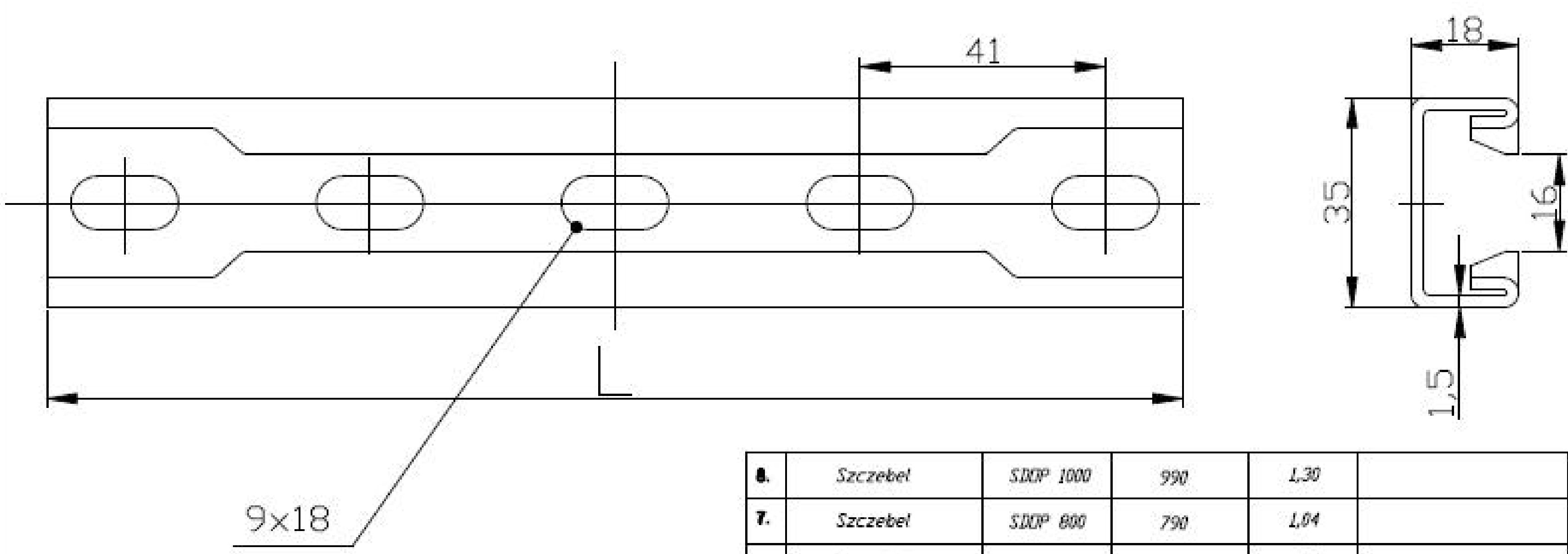


Symbol	Gwint M (mm)	Długość L (mm)	Masa (kg)	Nr katalogowy
PGM12/1	12	1000	0,72	651201
PGM10/1	10	1000	0,49	651001
PGM6/1	6	1000	0,16	650301

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



	Odchylka wymiarów nietolerowanych		Materiał: Gatunek	Stal cynkowana galwanicznie	Masa (kg)	Podziałka 1:1	Format A4
			Nr normy				Arkusz
			półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko: J.GRODHOWSKI	Podpis	Data: 20.10.05	Nazwa rysunku: PSRO M10x80			
Rysował	J.Grochowski		20.10.05				
Sprawdził	T.WLODARCZYK		20.10.05				
Zatwierdził	J.KLICZEK		20.10.05				Nr zmiany
	Profesjonalne Systemy Tras Kablowych			Nr rysunku: 804100			



L.p.	Nazwa wyrobu	Symbol	Długość L (mm)	Masa (kg)/szt.	Materiał	Nr katalogowy
8.	Szczebel	SDOP 1000	990	1,30		
7.	Szczebel	SDOP 800	790	1,04		
6.	Szczebel	SDOP 600	590	0,78		
5.	Szczebel	SDOP 500	490	0,65		
4.	Szczebel	SDOP 400	390	0,52		
3.	Szczebel	SDOP 300	290	0,39		
2.	Szczebel	SDOP 200	190	0,26		
1.	Szczebel	SDOP 100	90	0,13		

Odchyłka wymiarów nietolerowanych

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

Masa (kg) -----

Podziałka 1:1

Format A2

Arkusz

Arkuszy

Projektował

Rysował — Nazwisko: P.Okniński

Sprawdził

Zatwierdził

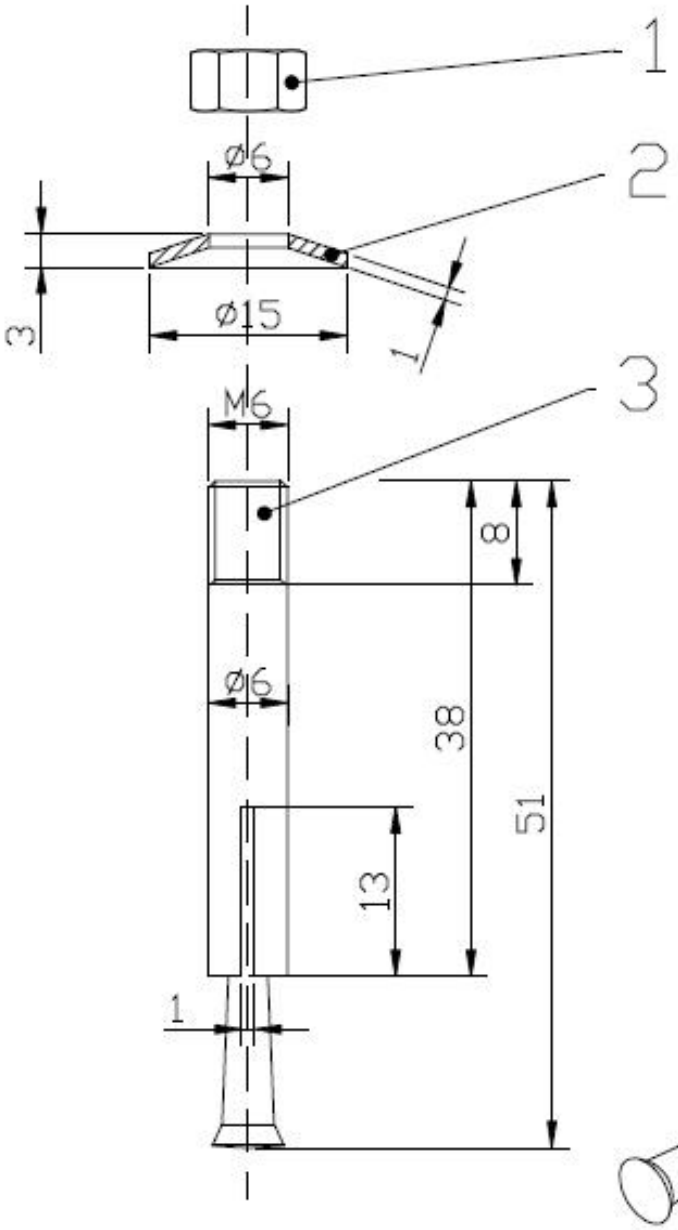
Podpis

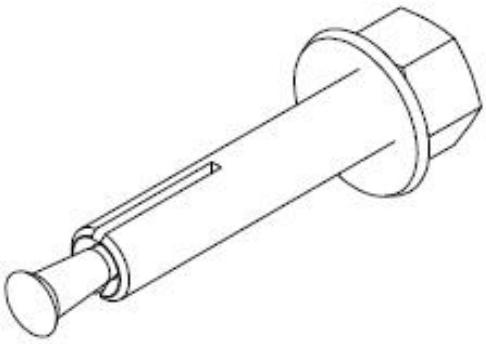
Data

Nazwa rysunku: SZCZEBEL SDOP

Profesjonalne Systemy Tras Kablowych

Nr katalogu: 8008....





03	ŚRUBA			L	
02	PODKŁADKA			L	
01	NAKRĘTKA M6			L	
L.P.	NAZWA (OPIS)	NR RYSUNKU	FORMAT	SZTUK	UWAGI

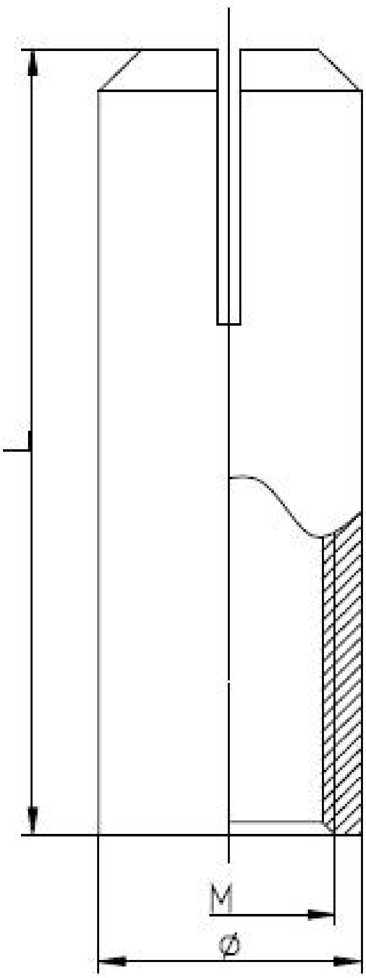
Odchyłka wymiarów nietolerowanych		Materiał: Gatunek		Masa (kg)	Podziałka 2:1	Format A4
		Nr normy		---		Arkusz
		półfabrykat (nr normy)				Arkuszy

Projektował	Nazwisko G.Matuszewski	Podpis	Data	Nazwa rysunku SRØM6x30
Rysował				
Sprawdził				
Zatwierdził				Śruba rozporowa

Profesjonalne Systemy Tras Kablowych

Nr rysunku — — —

Nr zmiany



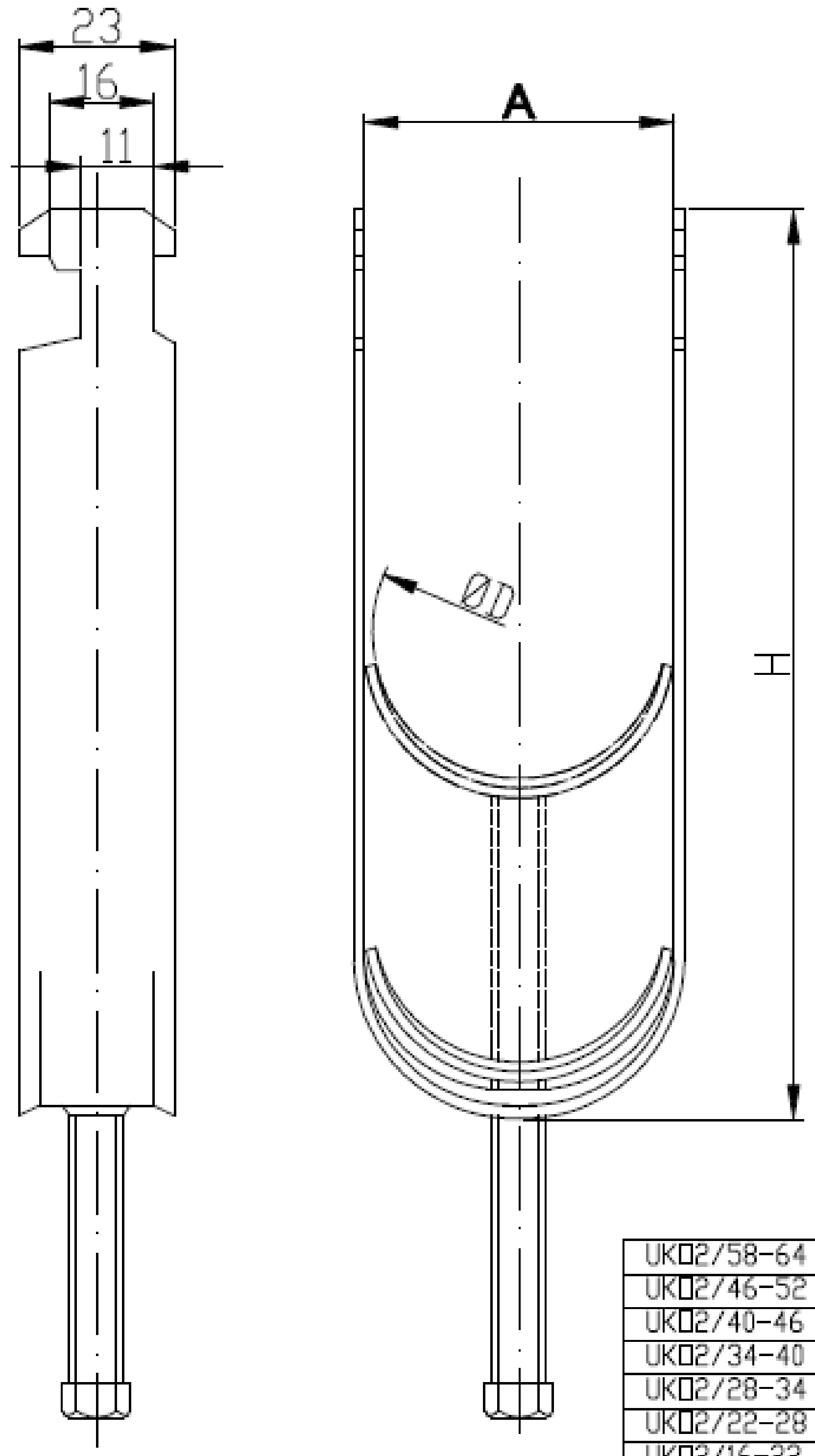
TRSOM10	12	M10	40
TRSOM6	8	M6	30
NAZWA	Ø	M	L

Odchyłka wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka	Format A4
		Nr normy		---	4:1	Arkusz
		półfabrykat (nr normy)				Arkuszy

	Nazwisko	Podpis	Data	
Projektował	G.Matuszewski			Nazwa rysunku: TRSOM...
Rysował	G.Matuszewski			
Sprawdził	--			
Zatwierdził	--			Nr zmiany

Profesjonalne Systemy Tras Kablowych

Nr rysunku: — — —



UK□2/58-64	66	163	64
UK□2/46-52	54	149	52
UK□2/40-46	48	132	46
UK□2/34-40	42	118	40
UK□2/28-34	36	105	34
UK□2/22-28	30	90	28
UK□2/16-22	24	80	22
SYMBOL	A	H	ØD

Odchyłki wymiarów nietolerowanych

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

Masa [kg]: ------

Podziałka: 1:1

Format: A4 — Arkusz: 1 — Arkuszy: 1

	Nazwisko	Podpis	Data
Projektował			
Rysował	G.Matuszewski		
Sprawdził			
Zatwierdził			

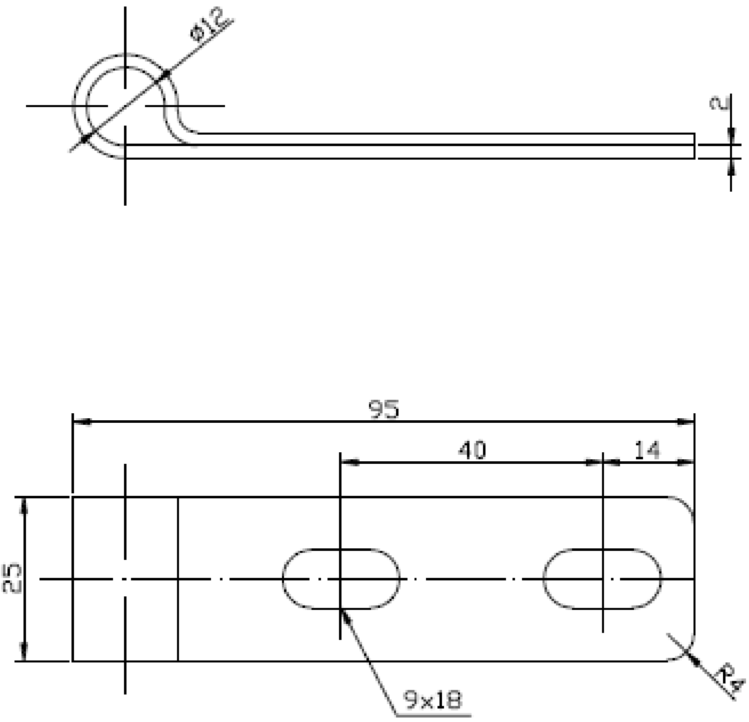
Nazwa rysunku: UK□2/...-...

Nr programu maszynowego: ---

Nr zmiany

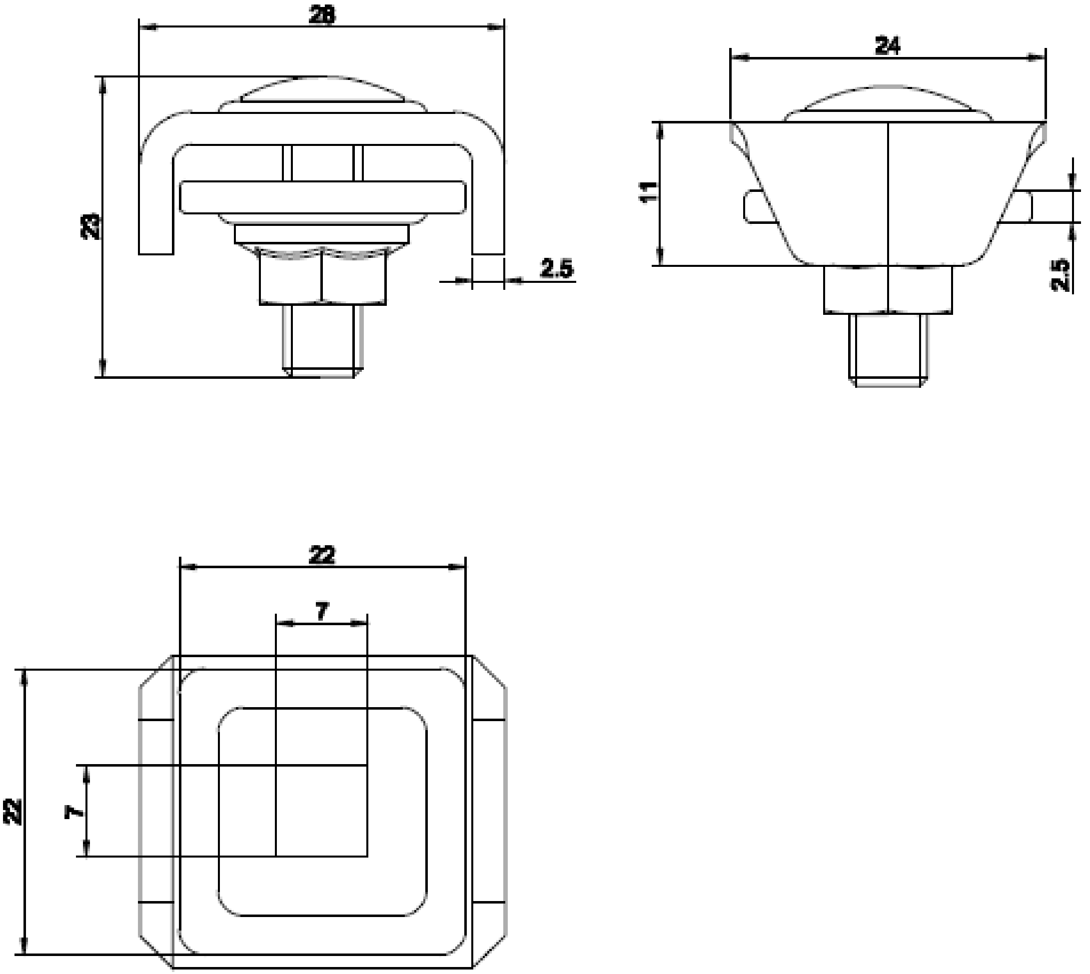
Nr rysunku

Profesjonalne Systemy Tras Kablowych

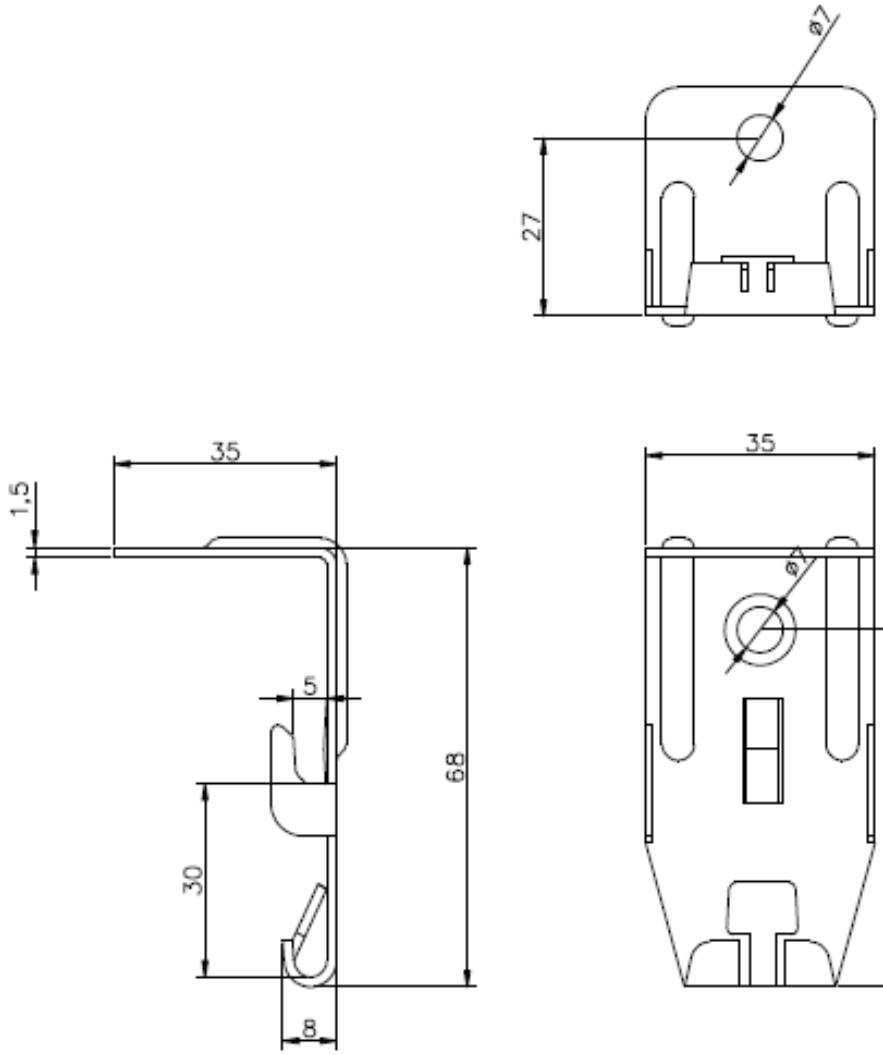


□cynk ogniowy

Odchyłka wymiarów nietolerowanych	±0,5	Materiał	Gatunek	——	Masa [kg] –––	Podziałka 1:1	Format A4
			Nr normy				Arkusz ——
			półfabrykat (nr normy)	——			Arkuszy ——
Projektował	Jacek Grochowski	Data	12.02.04	Nazwa rysunku	UPW□-F		
Rysował	Jakub Rudak		20.02.08				
Sprawdził	Jacek Kliczek		20.02.08				
Zatwierdził	Jacek Kliczek		20.02.08				Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku			

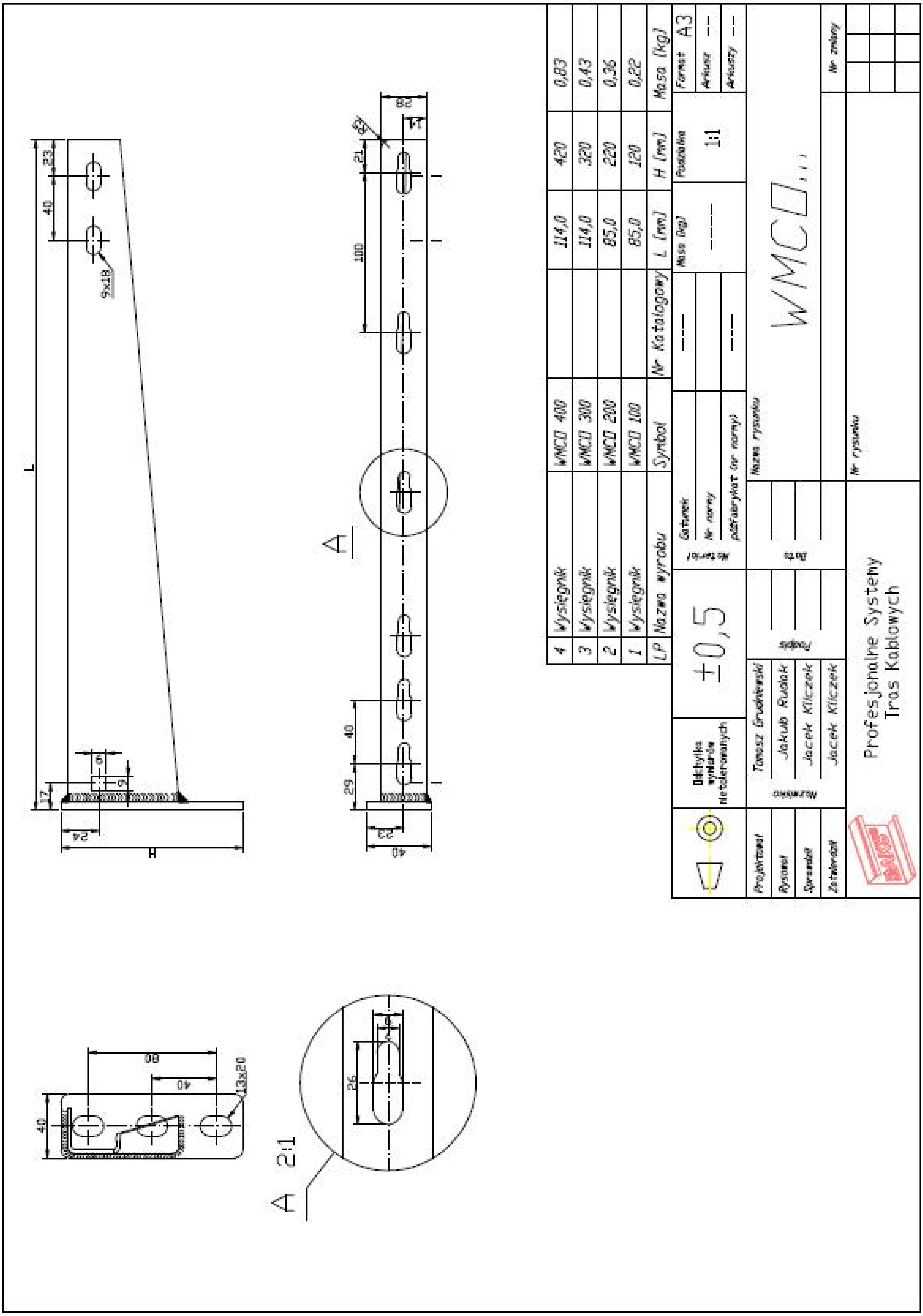


Odchyłki wymiarów nietolerowanych		Materiał: Gatunek / Nr normy / półfabrykat (nr normy)		Masa [kg] -------	Podziałka 2:1	Format A4; Arkusz 1; Arkuszy 1
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku: USS□ N		
Rysował	M.Sobolewski					
Sprawdził	J.Kilczek					
Zatwierdził	J.Kilczek			Nr programu koszykowego: —		Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku		

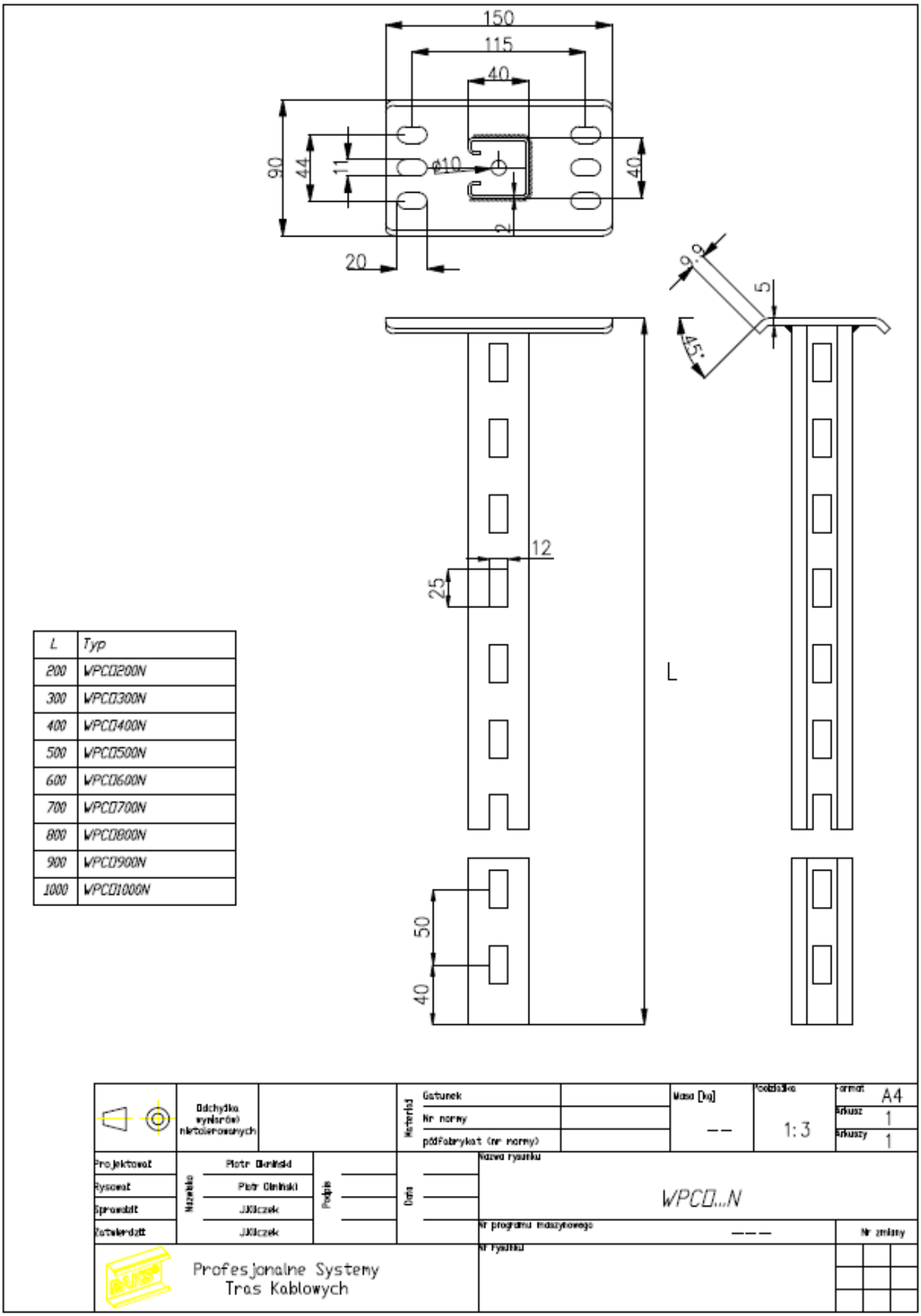


Ocynk ogniowy

	Odchyłka wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg]	Podziałka 1:1	Format A4	
			Nr normy				Arkusz 1	
			półfabrykat (nr normy)				Arkuszy 1	
Projektował	Nazwisko		Podpis	Data	Nazwa rysunku			
Rysował	P. DKNIŃSKI				WKS060-F			
Sprawdził					Nr programu maszynowego	---	Nr zmiany	
Zatwierdził	J.KLUCZEK				Nr rysunku	---		
	Profesjonalne Systemy Tras Kablowych							

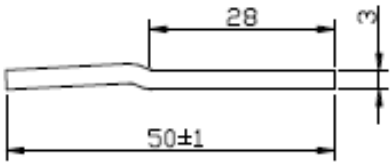


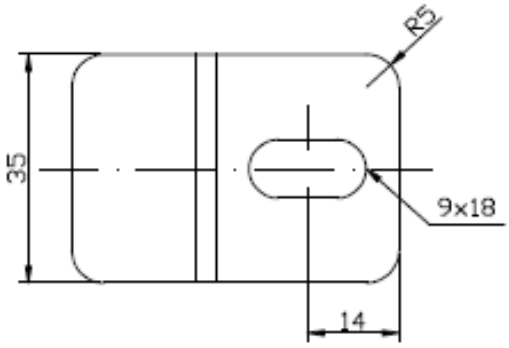
LP	Nazwa wyrobu	Symbol	Nr Katalogowy	L [mm]	H [mm]	Masa [kg]
4	Wysięgnik	WMC□ 400		114,0	420	0,83
3	Wysięgnik	WMC□ 300		114,0	320	0,43
2	Wysięgnik	WMC□ 200		85,0	220	0,36
1	Wysięgnik	WMC□ 100		85,0	120	0,22



L	Typ
200	WPCO200N
300	WPCO300N
400	WPCO400N
500	WPCO500N
600	WPCO600N
700	WPCO700N
800	WPCO800N
900	WPCO900N
1000	WPCO1000N

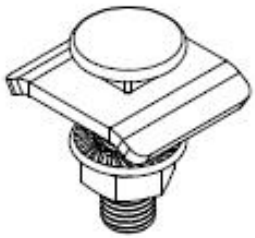
	Odchylka wymiarów nietolerowanych		Materiał	Gatunek		Masa [kg]	Podziałka 1:3	Format A4
				Nr normy		--		Arkusz 1
				półfabrykat (nr normy)				Arkuszy 1
Projektował	Nazwisko	Piotr Okniński	Podpis		Data	Nazwa rysunku WPCO...N		
Rysował		Piotr Okniński						
Sprawdził		J.Kliczek						
Zatwierdził		J.Kliczek				Nr programu maszynowego ---		Nr zmiany
	Profesjonalne Systemy Tras Kablowych					Nr rysunku		

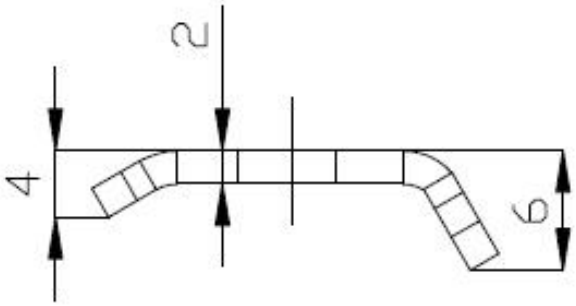


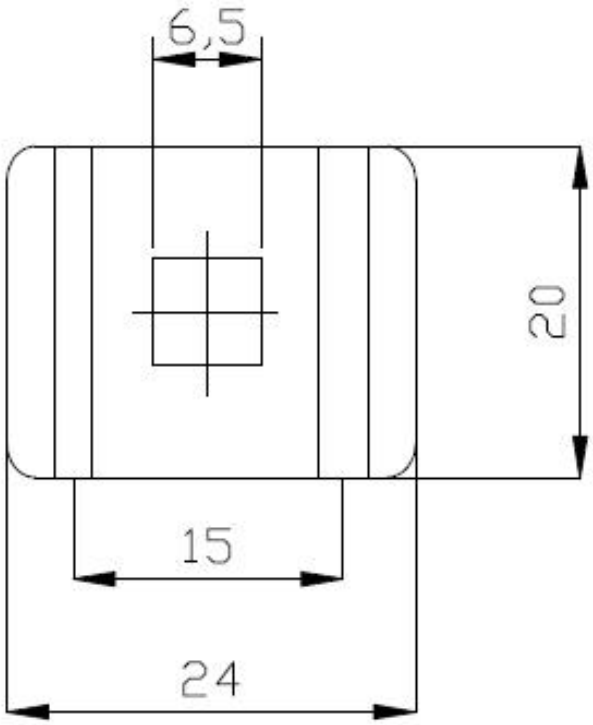


□cynk ogniowy

	Dokładność wykonania nieoznaczonych	±0,5	Materiał: Gatunek	---	Masa (kg) 0,025	Podziałka 1:1	Format A4	
			Nr normy				Arkusz ---	
			półfabrykat (nr normy)	---			Arkuszy ---	
Projektował	Nazwisko		Podpis	Data	Nazwa rysunku			
Rysował	M.Sobolewski				ZMO-F			
Sprawdził	J.Kliczek							
Zatwierdził	J.Kliczek						Nr zmiany	
Profesjonalne Systemy Tras Kablowych					Nr rysunku			







Ocynk ogniowy

	Odchylka wymiarów nietolerowanych		Materiał: Gatunek		Masa [kg] 0,07	Podziałka 1:1	Format A4
			Nr normy				Arkusz
			półfabrykat (nr normy)				Arkuszy
Projektował	Nazwisko	Podpis	Data	Nazwa rysunku: Zacisk śrubowy ZSO-F			
Rysował	M.Sobolewski						
Sprawdził							
Zatwierdził							Nr zmiany
Profesjonalne Systemy Tras Kablowych				Nr rysunku			

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 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

SKÚŠOBNÉ LABORATÓRIUM • PRÜFLABORATORIUM • TESTING LABORATORY • FIRES The Experts on Fire Safety -1-

Prepared by:

Miroslav Hudák
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