FIRES
The Experts On Fire Safety

# TEST REPORT FIRES-FR-256-08-AUNE

## Cable bearing system BAKS with cables


FIRES 004/S-11/04/2006-E

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FIRES
The Experts on Fire Safety

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SNAS
Reg. No. 041/S-159

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

# TEST REPORT

| | |
|---|---|
| Test report number: | **FIRES-FR-256-08-AUNE** |
| Tested property: | Function in fire |
| Test method: | DIN 4102 – 12:1998-11 |
| Date of issue: | **19. 12. 2008** |

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|---|---|
| Name of the product: | Cable bearing system BAKS with cables |
| Manufacturer: | **BAKS Kazimierz Sielski,** ul. Jagodne 5, 05-480 Karczew, Poland - producer of construction |
| | **Zaklady Kablowe Bitner Celina Bitner,** Friedleina 3/3, 30-009 Kraków, Poland – producer of cables |
| Sponsor: | **BAKS Kazimierz Sielski,** ul. Jagodne 5, 05-480 Karczew, Poland |

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| | |
|---|---|
| Task No.: | PR-08-0476 |
| Specimen received: | 14. 11. 2008 |
| Date of the fire test: | 20. 11. 2008 |

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

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|---|---|---|---|
| Number of pages: | 7 | Number of appendices: | 50 |
| Test reports: | 5 | Copy No.: | 4 |

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| Copy No.5: | **Zaklady Kablowe Bitner Celina Bitner,** Friedleina 3/3, 30-009 Kraków, Poland |

## 1. INTRODUCTION

This test report contains the results of the test carried out at the testing laboratory of FIRES s.r.o. in Batizovce. The purpose of the test was product classification. The test specimen was cable bearing system BAKS with power and communication non-halogen cables with circuit integrity maintenance. Persons witnessing the test:

Representatives of the sponsor: Mr. Kliczek (BAKS)
Mr. Lewandowski (BAKS)
Mr. Krajewski (Zaklady Kablowe Bitner)
Mr. Tokaj (Zaklady Kablowe Bitner)
Mr. Latacz (Zaklady Kablowe Bitner)

Test directed by: Mr. Marek Gorlický
Test carried out by: Mr. Miroslav Hudák
Operator: Mr. Ján Hurajt

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**Fires s.r.o. Batizovce is full member of EGOLF also, more information www.egolf.org.uk.**

## 2. MEASURING EQUIPMENT

| Identification number | Measuring equipment | Note |
|---|---|---|
| F 90 002 | Horizontal test furnace for fire testing | - |
| F 69 005 | PLC system for data acquisition and control TECOMAT NS 950 | - |
| F 40 008 | Software Control Web 2000 | |
| F 40 009 | Control and communication software to PLC TECOMAT NS 950 | |
| F 40 010 | Visual and calculating software to PLC TECOMAT NS 950 | - |
| F 40 011 | Driver Tecomat – CW 2000 (software) | - |
| F 71 008, F 71 009 | Transducer of differential pressure (from -50 to -150) Pa | pressure inside the test furnace |
| F 08 521, F 08 522, F 08 523, F 08 524 F 08 525, F 08 526, F 08 527, F 08 528 | Plate thermometers | temperature inside the test furnace, according to EN 1363-1 a DIN 4102-2 |
| F 08 701 | Sheathed thermocouple type K $\phi$ 3 mm | ambient temperature |
| F 69 009 | PLC system for data acquisition and climate control TECOMAT TC 604 | climatic conditions |
| F 60 001 – F 60 009 | Temperature and relative air humidity sensors | climatic conditions |
| F 54 057 | Racking meter | - |
| F 57 007 | Digital stop-watch | - |
| F 96 015 | Test signal panel | - |

## 3. PREPARATION OF THE SPECIMEN

Testing laboratory didn't take off individual components of the specimen. Components take-off and its delivering to the testing laboratory were carried out by the test sponsor. Assembling of the supporting system into the test furnace was carried out by workers of the test sponsor. Mounting of cables and weights into the supporting system was carried out by workers businesses BAKS and Zaklady Kablowe Bitner.

## 4. PREPARATION OF THE TEST

### 4.1 DESCRIPTION OF THE SPECIMEN STRUCTURE

Test specimen comprised from cable bearing systems BAKS with accessories – trays, ladders, clips UDF, UEF, UKO and sleeves – OZO and power and communication non-halogen cables business Zaklady Kablowe Bitner.

| | | |
|---|---|---|
| Cables: | NHXH 4x1,5 RE FE180 E90 MICA | ( 18 x ) |
| | NHXH 4x1,5 RE FE180 MICA 01 | ( 2 x ) |
| | NHXH 4x1,5 RE FE180 MICA 02 | ( 2 x ) |
| | NHXH 4x1,5 RE FE180 MICA 03 | ( 2 x ) |
| | NHXH 4x10 RE FE180 E90 MICA | ( 6 x ) |
| | NHXH 4x50 RM FE180 E90 MICA | ( 16 x ) |
| | (N)HXH 4x1,5 RE FE180 CERAMIC 0508 | ( 2 x ) |
| | (N)HXH 4x1,5 RE FE180 CERAMIC 0957 | ( 2 x ) |
| | (N)HXH 4x1,5 RE FE180 CERAMIC 1384 | ( 2 x ) |
| | (N)HXH 4x10 RE FE180 E90 CERAMIC | ( 4 x ) |
| | NHXCH 4x1,5/1,5 RE FE180 E90 MICA | ( 18 x ) |
| | NHXCH 4x1,5/1,5 RE FE180 MICA 01 | ( 2 x ) |
| | NHXCH 4x1,5/1,5 RE FE180 MICA 02 | ( 2 x ) |
| | NHXCH 4x1,5/1,5 RE FE180 MICA 03 | ( 2 x ) |
| | NHXCH 4x10/10 RE FE180 E90 MICA | ( 2 x ) |
| | NHXCH 4x50/25 RM FE180 E90 MICA | ( 16 x ) |
| | (N)HXCH 4x1,5/1,5 RE FE180 CERAMIC 0508 | ( 2 x ) |
| | (N)HXCH 4x1,5/1,5 RE FE180 CERAMIC 0957 | ( 2 x ) |
| | (N)HXCH 4x1,5/1,5 RE FE180 CERAMIC 1384 | ( 2 x ) |

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

Ceiling installation: was made by cable clips (type UDFE rustless), sleeves (type OZOE rustless) and ceiling ledges (type SDOC 400E rustless) which were fixed to ceiling by dowels (type SRO M6x30E) in spacing of 600 mm. Cables were fixed to ledges by clips (type UKO1E rustless) in spacing of 600 mm. Cable clips (type UDF and UEF) were fixed to ceiling by dowels (type SRO M6x30) in spacing of 300 mm. Cable clips were depending on the diameter of cables.

Suspension track No. 1: was made by three hangers (type WPCO 900) which were fixed to ceiling by two dowels (type PSRO M10x80) in spacing of 1500 mm. Three booms (type WWSO 400) were fixed by screws (type SM M10x20) at each hanger. Holders (type UPWO) were fixed at the end of booms. Booms were fixed through these holders by threaded bar (type PGM10/1x600) with washers and nuts M10 to ceiling holder (type USOV) which was fixed to ceiling by dowel (type PSRO M10x80).

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

Ladders (type DGOD 400H60/3N, steel sheet thickness 1,2 mm) were fixed at central booms and jointed together by junction (type LDOCH60N) with screws M8 (type SGN M8x14). Ladders were fixed to booms by clips (type ZMO) with screws M8 (type SGN M8x14).

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

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

Suspension track No. 2: was made of three consoles combined of three horizontal supports (type CWOP40H40/05E rustless) and two threaded bar (type PGM10/1x600E rustless) with washers and nuts M10 and two hangers (type WPPOVE rustless) which were fixed to ceiling by dowels (type PSRO M10x80E rustless) in spacing of 1500 mm.

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

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

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

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

Suspension track No. 3: was made by three hangers (type WPCO 900E rustless) which were fixed to ceiling by two dowels (type PSRO M10x80E rustless) in spacing of 1500 mm. Three booms (type WMCO 400E rustless) were fixed by screws (type SM M10x20/E) at each hanger. Holders (type UPWOE) were fixed at the end of booms. Booms were fixed through these holders by threaded bar (type PGM10/1x600E rustless) with washers and nuts M10 to ceiling holder (type USOVE) which was fixed to ceiling by dowel (type PSRO M10x80E).

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

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

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

Types of individual components are from catalogue BAKS.

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

More detailed information about specimen construction is shown in the drawings which form the appendix of this test report. Drawings were delivered by the sponsor of the test.

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

4.2 DESCRIPTION OF THE SPECIMEN FIXATION

The test specimen was fixed on the ceiling of the test furnace which was created from concrete panels made of common shocked concrete of class B 20, 150 mm thick.
The type of specimen fixation into the test furnace is visible in drawing documentation and it was selected by the sponsor.

4.3 SPECIMEN INSPECTION

Before and after the fire testing, conformity of the test specimen with drawing was checked. The specimen corresponded to the drawing which create appendix of this report.
Specimen inspection consisted of visual review of the test specimen as well as size verification (number and cross sections of conductors, thickness, measurements of cables and trays).

4.4 CLIMATIC CONDITIONING

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

| **Relative air humidity [%]** | | **Ambient air temperature [°C]** | |
|---|---|---|---|
| mean | standard deviation | mean | standard deviation |
| 49,6 | 4,9 | 23,0 | 0,5 |

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

## 5. CARRYING OUT THE TEST

5.1 TEST CONDITIONS

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

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

| **Date of fire test** | **Relative air humidity [%]** | **Ambient air temperature [°C]** |
|---|---|---|
| 20. 11. 2008 | 61,1 | 15,4 |

5.2 TEST RESULTS

The measured values are shown in tables that form an integral part of this test report.

5.3 EVALUATION OF THE TEST

| SPECIMENS | Time to first failure/interruption of conductor |
|---|---|
| Specimen 1: cables NHXCH 4x50/25 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 2: cables (N)HXH 4x1,5 RE FE180 CERAMIC 0508 | 70 minutes |
| Specimen 2: cables (N)HXCH 4x1,5/1,5 RE FE180 CERAMIC 0508 | 70 minutes |
| Specimen 3: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 4: cables NHXCH 4x50/25 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 5: cables NHXH 4x50 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 6: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 7: cables NHXH 4x1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 8: cables NHXH 4x50 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 9: cables (N)HXCH 4x1,5/1,5 RE FE180 CERAMIC 1384 | 90 minutes no failure/interruption |
| Specimen 10: cables (N)HXH 4x1,5 RE FE180 CERAMIC 1384 | 90 minutes no failure/interruption |
| Specimen 11: cables NHXH 4x1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 12: cables NHXH 4x10 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 13: cables (N)HXH 4x10 RE FE180 E90 CERAMIC | 90 minutes no failure/interruption |
| Specimen 14: cables NHXCH 4x50/25 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 15: cables (N)HXCH 4x1,5/1,5 RE FE180 CERAMIC 0957 | 36 minutes |
| Specimen 16: cables (N)HXH 4x1,5 RE FE180 CERAMIC 0957 | 38 minutes |
| Specimen 17: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 18: cables NHXCH 4x50/25 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 19: cables NHXH 4x50 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 20: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 21: cables NHXH 4x1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 22: cables NHXH 4x50 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 23: cables NHXCH 4x1,5/1,5 RE FE180 MICA 02 | 76 minutes |
| Specimen 24: cables NHXH 4x1,5 RE FE180 MICA 02 | 89 minutes |
| Specimen 25: cables NHXH 4x1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 26: cables NHXH 4x10 RE FE180 E90 MICA | 76 minutes |
| Specimen 27: cables (N)HXH 4x10 RE FE180 E90 CERAMIC | 90 minutes no failure/interruption |
| Specimen 28: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 29: cables NHXH 4x1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 30: cables NHXCH 4x50/25 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 31: cables NHXH 4x50 RM FE180 E90 MICA | 51 minutes |
| Specimen 32: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 33: cables NHXH 4x1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 34: cables NHXCH 4x50/25 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 35: cables NHXH 4x50 RM FE180 E90 MICA | 41 minutes |
| Specimen 36: cables NHXCH 4x10/10 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 37: cables NHXH 4x10 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 38: cables NHXCH 4x50/25 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 39: cables NHXCH 4x1,5/1,5 RE FE180 MICA 03 | 90 minutes no failure/interruption |
| Specimen 40: cables NHXH 4x1,5 RE FE180 MICA 03 | 90 minutes no failure/interruption |
| Specimen 41: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 42: cables NHXCH 4x50/25 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 43: cables NHXH 4x50 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 44: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 45: cables NHXH 4x1,5 RE FE180 E90 MICA | 48 minutes |
| Specimen 46: cables NHXH 4x50 RM FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 47: cables NHXCH 4x1,5/1,5 RE FE180 MICA 01 | 90 minutes no failure/interruption |
| Specimen 48: cables NHXH 4x1,5 RE FE180 MICA 01 | 90 minutes no failure/interruption |
| Specimen 49: cables NHXH 4x1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 50: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |
| Specimen 51: cables NHXH 4x1,5 RE FE180 E90 MICA | 90 minutes no failure/interruption |

The fire test was discontinued in 92nd minute at the request of sponsor.

Specimens S1 – S51 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.

## 6. CLOSING

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

**Report checked by:** Ing. Štefan Rástocký

**Issued by:**

Ing. Štefan Rástocký
leader of the testing laboratory

**Responsible for the technical side of this report:**

Miroslav Hudák
technician of the testing laboratory

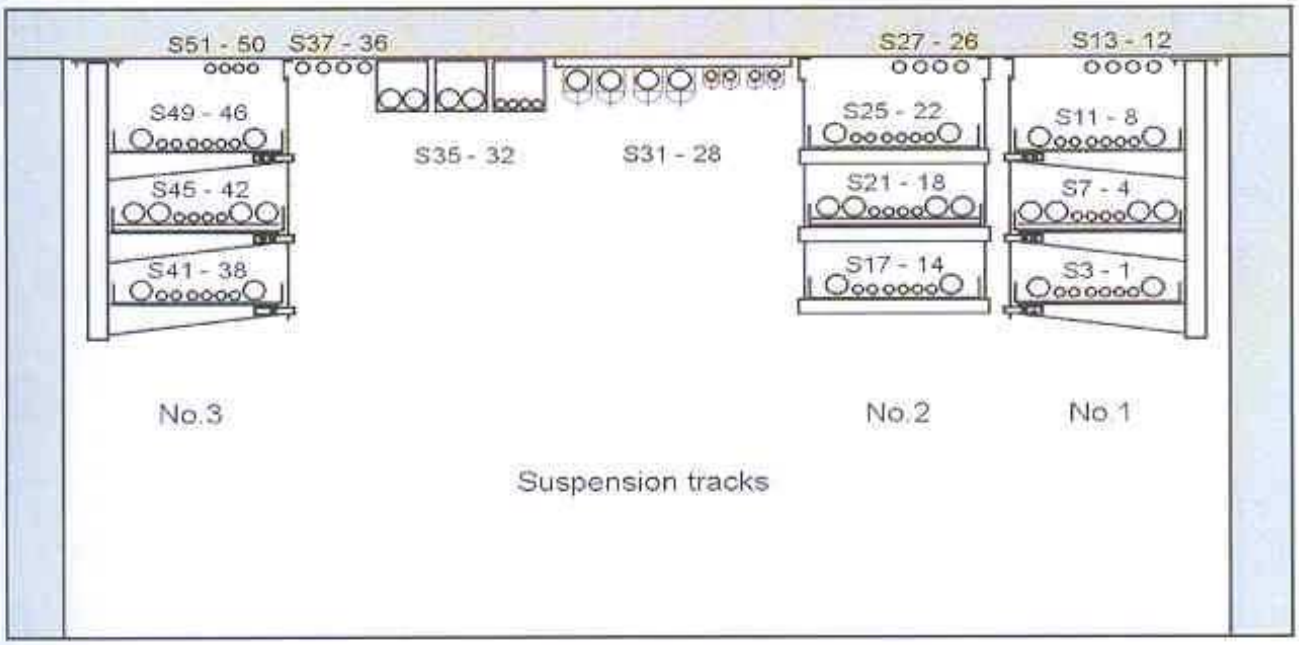
## 7. NORMATIVE REFERENCES

| | |
|---|---|
| DIN 4102 – 2:1977-09 | Fire behaviour of building materials and elements - requirements and testing |
| DIN 4102 – 12:1998-11 | Fire resistance of electric cable systems required to maintain circuit integrity |
| STN EN 1363-1:2001 | Fire resistance tests – Part 1: General requirements |

## 8. LIST OF APPENDICES

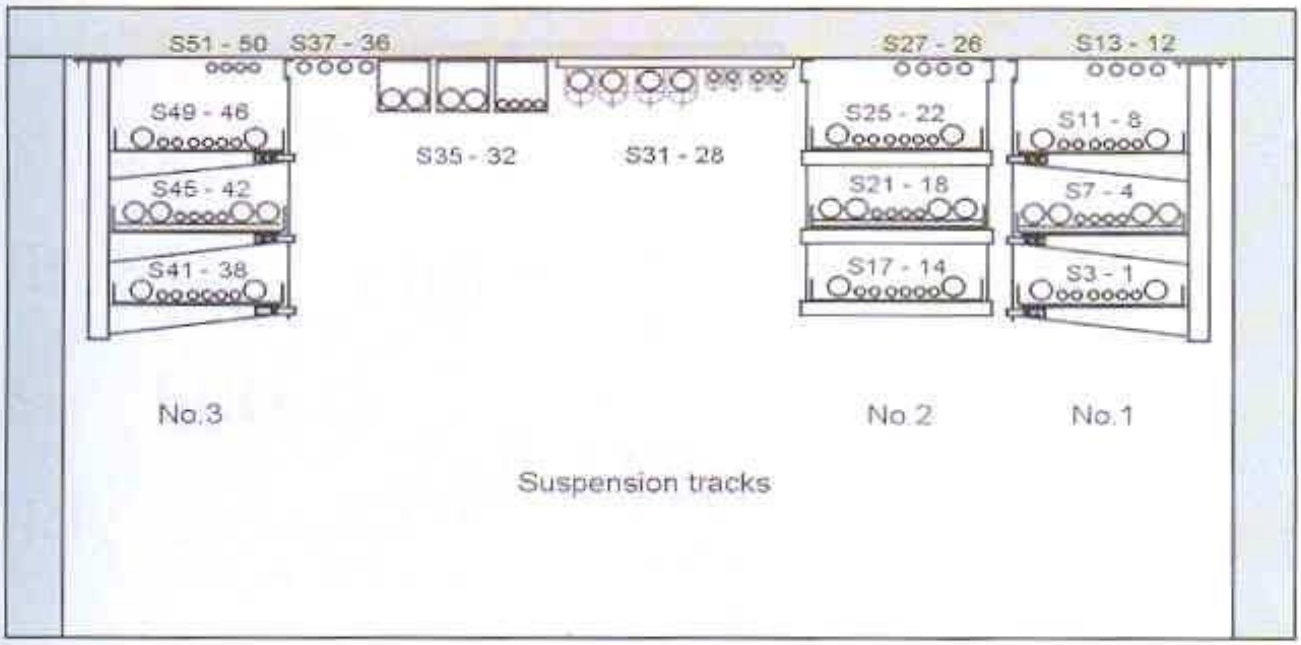
| | |
|---|---|
| Appendix 1 | Measured values inside the test furnace |
| Appendix 2 | Measured values inside the test furnace / graph |
| Appendix 3 | Measured times of tested specimens from S1 to S8 |
| Appendix 4 | Measured times of tested specimens from S9 to S16 |
| Appendix 5 | Measured times of tested specimens from S17 to S24 |
| Appendix 6 | Measured times of tested specimens from S25 to S33 |
| Appendix 7 | Measured times of tested specimens from S34 to S42 |
| Appendix 8 | Measured times of tested specimens from S43 to S51 |
| Appendix 9 - 10 | Layout of cables in the test furnace |
| Appendix 11 - 12 | Photos taken before and after the fire test |
| Appendix 13 - 50 | Drawings |

## Layout of cables in the test furnace




| | |
|---|---|
| Specimen 1: cables NHXCH 4x50/25 RM FE180 E90 MICA | Specimens placed in the trays KCOD 400H60/3N (BAKS) Suspension track No.1 |
| Specimen 2: cables (N)HXH 4x1,5 RE FE180 CERAMIC 0508 | |
| Specimen 2: cables (N)HXCH 4x1,5/1,5 RE FE180 CERAMIC 0508 | |
| Specimen 3: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | |
| Specimen 4: cables NHXCH 4x50/25 RM FE180 E90 MICA | Specimens placed on the ladders DGOD 400H60/3N (BAKS) Suspension track No.1 |
| Specimen 5: cables NHXH 4x50 RM FE180 E90 MICA | |
| Specimen 6: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | |
| Specimen 7: cables NHXH 4x1,5 RE FE180 E90 MICA | |
| Specimen 8: cables NHXH 4x50 RM FE180 E90 MICA | Specimens placed in the trays KCOD 400H60/3N (BAKS) Suspension track No.1 |
| Specimen 9: cables (N)HXCH 4x1,5/1,5 RE FE180 CERAMIC 1384 | |
| Specimen 10: cables (N)HXH 4x1,5 RE FE180 CERAMIC 1384 | |
| Specimen 11: cables NHXH 4x1,5 RE FE180 E90 MICA | |
| Specimen 12: cables NHXH 4x10 RE FE180 E90 MICA | Specimens placed in ceiling clips UEF (BAKS) in spacing of 300 mm |
| Specimen 13: cables (N)HXH 4x10 RE FE180 E90 CERAMIC | |
| Specimen 14: cables NHXCH 4x50/25 RM FE180 E90 MICA | Specimens placed in the trays KCOJ 400H60/3E (BAKS) Suspension track No.2 |
| Specimen 15: cables (N)HXCH 4x1,5/1,5 RE FE180 CERAMIC 0957 | |
| Specimen 16: cables (N)HXH 4x1,5 RE FE180 CERAMIC 0957 | |
| Specimen 17: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | |
| Specimen 18: cables NHXCH 4x50/25 RM FE180 E90 MICA | Specimens placed on the ladders DGOD 400H60/3E (BAKS) Suspension track No.2 |
| Specimen 19: cables NHXH 4x50 RM FE180 E90 MICA | |
| Specimen 20: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | |
| Specimen 21: cables NHXH 4x1,5 RE FE180 E90 MICA | |
| Specimen 22: cables NHXH 4x50 RM FE180 E90 MICA | Specimens placed in the trays KCOJ 400H60/3E (BAKS) Suspension track No.2 |
| Specimen 23: cables NHXCH 4x1,5/1,5 RE FE180 MICA 02 | |
| Specimen 24: cables NHXH 4x1,5 RE FE180 MICA 02 | |
| Specimen 25: cables NHXH 4x1,5 RE FE180 E90 MICA | |
| Specimen 26: cables NHXH 4x10 RE FE180 E90 MICA | Specimens placed in ceiling clips UDF (BAKS) in spacing of 300 mm |
| Specimen 27: cables (N)HXH 4x10 RE FE180 E90 CERAMIC | |
| Specimen 28: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | Specimens placed in ceiling profile ledges SDOC 400E with clips UKO1E (BAKS) in spacing of 600 mm |
| Specimen 29: cables NHXH 4x1,5 RE FE180 E90 MICA | |
| Specimen 30: cables NHXCH 4x50/25 RM FE180 E90 MICA | |
| Specimen 31: cables NHXH 4x50 RM FE180 E90 MICA | |
| Specimen 32: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | Specimens placed in ceiling clips OZOE (BAKS) in spacing of 600 mm |
| Specimen 33: cables NHXH 4x1,5 RE FE180 E90 MICA | |
| Specimen 34: cables NHXCH 4x50/25 RM FE180 E90 MICA | |
| Specimen 35: cables NHXH 4x50 RM FE180 E90 MICA | |
| Specimen 36: cables NHXCH 4x10/10 RE FE180 E90 MICA | Specimens placed in ceiling clips UDFE (BAKS) in spacing of 600 mm |
| Specimen 37: cables NHXH 4x10 RE FE180 E90 MICA | |

## Layout of cables in the test furnace




| | |
|---|---|
| Specimen 38: cables NHXCH 4x50/25 RM FE180 E90 MICA | Specimens placed in the trays KCOJ 400H60/3E (BAKS) Suspension track No.3 |
| Specimen 39: cables NHXCH 4x1,5/1,5 RE FE180 MICA 03 | |
| Specimen 40: cables NHXH 4x1,5 RE FE180 MICA 03 | |
| Specimen 41: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | |
| Specimen 42: cables NHXCH 4x50/25 RM FE180 E90 MICA | Specimens placed on the ladders DGOD 400H60/3E (BAKS) Suspension track No.3 |
| Specimen 43: cables NHXH 4x50 RM FE180 E90 MICA | |
| Specimen 44: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | |
| Specimen 45: cables NHXH 4x1,5 RE FE180 E90 MICA | |
| Specimen 46: cables NHXH 4x50 RM FE180 E90 MICA | Specimens placed in the trays KCOJ 400H60/3E (BAKS) Suspension track No.3 |
| Specimen 47: cables NHXCH 4x1,5/1,5 RE FE180 MICA 01 | |
| Specimen 48: cables NHXH 4x1,5 RE FE180 MICA 01 | |
| Specimen 49: cables NHXH 4x1,5 RE FE180 E90 MICA | |
| Specimen 50: cables NHXCH 4x1,5/1,5 RE FE180 E90 MICA | Specimens placed in ceiling clips UDFE (BAKS) in spacing of 600 mm |
| Specimen 51: cables NHXH 4x1,5 RE FE180 E90 MICA | |

Badanie torów kablowych w FIRES na Słowacji w dniu 20.11.2008.

Zestawienie: osprzęt BAKS + kable Bitner



| p | vzorka | Symbol kabla | Pozycja w piecu | Konstrukcja mocowania, odległość, obciążenie | Uwagi |
|---|---|---|---|---|---|
| | 38 | NHXCH FE 180 E90 4x 50/25 | 1 | Korytko kablowe KCOJ400H60E.... B-400/1,5m /10 kg/m, grubość blachy 1,0 mm. Mocowanie: wspornik WPCOE....., wysięgnik WMCO 400E, pręt gwintowany PGM10/E..., uchwyt USOVE do betonu za pomocą kołków rozporowych PSRO M10x80E, Materiał: stal kwosoodporna. | |
| | | NHXCH FE 180 E90 4x 50/25 | | | |
| | 41 | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | 40 | NHXH FE 180 4x 1,5 mica 03 | | | test mica 03 |
| | | NHXH FE 180 4x 1,5 mica 03 | | | test mica 03 |
| | 39 | NHXCH FE 180 4x 1,5/1,5 mica 03 | | | test mica 03 |
| | | NHXCH FE 180 4x 1,5/1,5 mica 03 | | | test mica 03 |
| | 43 | NHXH FE 180 E90 4x 50 | 2 | Drabinka kablowa DGOD400H60/E... B-400/1,5m /20 kg/m, grubość blachy 1,2 mm. Mocowanie: wspornik WPCOE....., wysięgnik WMCO 400E, pręt gwintowany PGM10/E..., uchwyt USOVE do betonu za pomocą kołków rozporowych PSRO M10x80E, Materiał: stal kwosoodporna. | |
| | | NHXH FE 180 E90 4x 50 | | | |
| | 42 | NHXCH FE 180 E90 4x 50/25 | | | |
| | | NHXCH FE 180 E90 4x 50/25 | | | |
| | 45 | NHXH FE 180 E90 4x 1,5 | | | |
| | | NHXH FE 180 E90 4x 1,5 | | | |
| | 44 | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | 46 | NHXH FE 180 E90 4x 50 | 3 | Korytko kablowe KCOJ400H60E.... B-400/1,5m /10 kg/m, grubość blachy 1,0 mm. Mocowanie: wspornik WPCOE....., wysięgnik WMCO 400E, pręt gwintowany PGM10/E..., uchwyt USOVE do betonu za pomocą kołków rozporowych PSRO M10x80E, Materiał: stal kwosoodporna. | |
| | | NHXH FE 180 E90 4x 50 | | | |
| | 49 | NHXH FE 180 E90 4x 1,5 | | | |
| | | NHXH FE 180 E90 4x 1,5 | | | |
| | 48 | NHXH FE 180 4x 1,5 mica 01 | | | test mica 01 |
| | | NHXH FE 180 4x 1,5 mica 01 | | | test mica 01 |
| | 47 | NHXCH FE 180 4x 1,5/1,5 mica 01 | | | test mica 01 |
| | | NHXCH FE 180 4x 1,5/1,5 mica 01 | | | test mica 01 |
| | 51 | NHXH FE 180 E90 4x 1,5 | 4 | Uchyt kablowy UDFE ...; mocowanie do betonu co 0,6 m za pomocą kołków rozporowych SRO M6x30E. Materiał: stal kwosoodporna. | |
| | | NHXH FE 180 E90 4x 1,5 | | | |
| | 50 | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | 37 | NHXH FE 180 E90 4x 10 | | | |
| | | NHXH FE 180 E90 4x 10 | | | |
| | 36 | NHXCH FE 180 E90 4x 10/10 | | | |
| | | NHXCH FE 180 E90 4x 10/10 | | | |
| | 35 | NHXH FE 180 E90 4x 50 | 5 | Obejma kablowa OZOE: mocowanie do betonu co 0,6 m za pomocą kołków rozporowych SRO M6x30E. Materiał: stal kwosoodporna. | |
| | | NHXH FE 180 E90 4x 50 | | | |
| | 34 | NHXCH FE 180 E90 4x 50/25 | | | |
| | | NHXCH FE 180 E90 4x 50/25 | | | |
| | 33 | NHXH FE 180 E90 4x 1,5 | | | |
| | | NHXH FE 180 E90 4x 1,5 | | | |
| | 32 | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | | NHXCH FE 180 E90 4x 1,5/1,5 | | | |

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Dátum/Date 20.11.2008

Podpis/Signature

Dokument č./Document No. FIRES-FR-256-08-ANNEX

Príloha č./Appendix No. 22

Badanie torów kablowych w FIRES na Słowacji w dniu 20.11.2008.

Zestawienie: osprzęt BAKS + kable Bitner



| | wzorka | Symbol kabla | Pozycja w piecu | Konstrukcja mocowania, odległość, obciążenie | Uwagi |
|---|---|---|---|---|---|
| | 5 | NHXH FE 180 E90 4x 50 | 12 | Drabinka kablowa DGOD400H60... B-400/1,5m /20 kg/m, grubość blachy 1,2 mm, Mocowanie: wspornik WPCO..... wysięgnik WWS 400, pręt gwintowany PGM10..., uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x80, Materiał: stal kostrukcyjna cynkowana metodą Sendzimira. | |
| | | NHXH FE 180 E90 4x 50 | | | |
| | 4 | NHXCH FE 180 E90 4x 50/25 | | | |
| | | NHXCH FE 180 E90 4x 50/25 | | | |
| | 7 | NHXH FE 180 E90 4x 1,5 | | | |
| | | NHXH FE 180 E90 4x 1,5 | | | |
| | 6 | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | 14 | NHXCH FE 180 E90 4x 50/25 | 13 | Korytko kablowe KCOJ400H60E.... B-400/1,5m /10 kg/m, grubość blachy 1,0 mm, Mocowanie: pręt gwintowany PGM10/E...., Ceownik CWOP 40H40/0,5E ; uchwyt przegubowy WPPOVE do betonu za pomocą kołków rozporowych PSRO M10x80E, Materiał: stal kwosoodporna. | |
| | | NHXCH FE 180 E90 4x 50/25 | | | |
| | 17 | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | 16 | (N)HXH FE 180 4x 1,5 ceram 0957 | | | test ceram 0957 |
| | | (N)HXH FE 180 4x 1,5 ceram 0957 | | | test ceram 0957 |
| | 15 | (N)HXCH FE 180 4x 1,5/1,5 ceram 0957 | | | test ceram 0957 |
| | | (N)HXCH FE 180 4x 1,5/1,5 ceram 0957 | | | test ceram 0957 |
| | 1 | NHXCH FE 180 E90 4x 50/25 | 14 | Korytko kablowe KCOD400H60.... B-400/1,5m /10 kg/m, grubość blachy 1,2 mm, Mocowanie: wspornik WPCOE..... wysięgnik WWS400, pręt gwintowany PGM10..., uchwyt USOV do betonu za pomocą kołków rozporowych PSRO M10x80, Materiał: stal kostrukcyjna cynkowana metodą Sendzimira. | |
| | | NHXCH FE 180 E90 4x 50/25 | | | |
| | 3 | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | | NHXCH FE 180 E90 4x 1,5/1,5 | | | |
| | 2 | (N)HXH FE 180 4x 1,5 ceram 0508 | | | test ceram 0508 |
| | | (N)HXH FE 180 4x 1,5 ceram 0508 | | | test ceram 0508 |
| | | (N)HXCH FE 180 4x 1,5/1,5 ceram 0508 | | | test ceram 0508 |
| | | (N)HXCH FE 180 4x 1,5/1,5 ceram 0508 | | | test ceram 0508 |

Wymiary kabli

| Lp | Symbol kabla | Średnica kabla | Ciężar kabla | |
|---|---|---|---|---|
| 1 | NHXH FE 180 E90 4x 50 | 38,8 mm | 3,5 kg/km | |
| 2 | NHXCH FE 180 E90 4x 50/25 | 40,2 mm | 3,8 kg/km | |
| 4 | NHXH FE 180 E90 4x 10 | 22 mm | 0,85 kg/m | |
| 5 | NHXCH FE 180 E90 4x 10/10 | 23 mm | 0,95 kg/m | |
| 6 | (N)HXH FE 180 E90 4x 10 | 22 mm | 0,85 kg/m | |
| 7 | NHXH FE 180 E90 4x 1,5 | 15mm | 0,34 kg/m | |
| 8 | NHXCH FE 180 E90 4x 1,5/1,5 | 16mm | 0,36 kg/m | |
| 10 | (N)HXH FE 180 E90 4x 1,5 | 15mm | 0,34 kg/m | |
| 11 | (N)HXCH FE 180 E90 4x 1,5/1,5 | 16mm | 0,36 kg/m | |

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Príloha č./Appendix No. 23