

## **TEST REPORT FIRES-FR-223-18-AUNE**

**Cable supporting system Molek Lapidot with power and communication  
halogen-free cables Tele-Fonika Kable**

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## TEST REPORT

### FIRES-FR-223-18-AUNE

**Tested property:** Functional resistance in fire  
STN 92 0205: 2014

**Test method:** (ČSN 73 0895: 2016, DIN 4102-12: 1998-11) acc. to cl. 1 of this test report

**Test type:** Accredited

**Date of issue:** 08. 11. 2018

**Name of the product:** Cable supporting system Molek Lapidot with power and communication halogen-free cables Tele-Fonika Kable

**Manufacturer:** Molek Lapidot Ltd., 30 Modiin St., Segula Industrial Zone, 4927176 Petach Tikva, Israel (producer of cable supporting system)  
  
Tele-Fonika Kable S.A., Ul. Hipolita Cegielskiego 1, 32 – 400 Myślenice, Poland (producer of cables)

**Sponsor:** Molek Lapidot Ltd., 30 Modiin St., Segula Industrial Zone, 4927176 Petach Tikva, Israel

**Test carried out by:** FIRES, s.r.o., Testing laboratory

**Task No.:** PR-18-0448

**Specimens received:** 01. 10. 2018

**Date of the test:** 18. 10. 2018

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

Number of pages: 41

Test reports: 5

Copy No.: 2

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## 1. INTRODUCTION

This test report contains the results of a test carried out by FIRES, s.r.o., Testing laboratory in Batizovce, accredited for testing by SNAS. Certificate of accreditation No.: S-159. The purpose of the test was to gain information for product classification.

Test of function in fire was carried out according to standard STN 92 0205. Similar standards and regulations for tests of function in fire are ČSN 73 0895: 2016 and DIN 4102-12: 1998-11.

Deviations from standard at the test according to ČSN 73 0895: 2016: This test was carried out according to standard STN 92 0205 and meets also all requirements of ČSN 73 0895: 2016 and test results can be directly used for classification of tested cables according to ČSN 73 0895: 2016. There are no deviations identified in process and carrying out of test.

Deviations from standard at the test according to DIN 4102-12: 1998-11: This test was carried out according to standard STN 92 0205 and meets requirements of DIN 4102-12: 1998-11. Basic deviation in process and carrying out of test between these standards is in measuring and in control of temperature in the test furnace. According to STN 92 0205, plate thermometers according to EN 1363-1 are used. According to DIN 4102-12: 1998-11, common thermocouples of construction which was used for this measurement till issue of EN 1363-1 are used. Measurement by plate thermometers acc. to EN 1363-1 can be considered as stricter method of temperature control in test furnace in compare with thermocouples used till issue of EN 1363-1. Therefore, it is possible to use results of test according to STN 92 0205 for classification of tested cables according to DIN 4102-12: 1998-11, but not conversely. Identified deviation results in stricter course of test and it can lead to reduced classification of tested cables what is accepted as enhanced security in practice.

Sponsor's representatives witnessing the test:

|                     |                        |
|---------------------|------------------------|
| Mr. Efraim Molek    | Molek Lapidot Ltd.     |
| Mr. Avner Pliner    | Molek Lapidot Ltd.     |
| Mr. Lukasz Daniel   | Tele-Fonika Kable S.A. |
| Mr. Tomasz Zdechlik | Tele-Fonika Kable S.A. |

|                              |                                |
|------------------------------|--------------------------------|
| test carried out by operator | Dávid Šubert<br>Miroslav Hudák |
|------------------------------|--------------------------------|

## 2. MEASURING EQUIPMENT

| Identification number | Measuring equipment                                                   | Note                                               |
|-----------------------|-----------------------------------------------------------------------|----------------------------------------------------|
| F 90 004              | Horizontal test furnace for fire resistance testing                   | -                                                  |
| F 69 010              | PLC system for data acquisition and control<br>TECOMAT TC 700         | -                                                  |
| F 40 019              | Visual and calculating software to PLC<br>TECOMAT TC 700              | -                                                  |
| F 40 017              | Control and communication software to PLC<br>TECOMAT TC 700           | -                                                  |
| F 40 018              | SW Reliance                                                           | -                                                  |
| F 40 020              | Driver Tecomat - Reliance (SW)                                        | -                                                  |
| F 71 041, F 71 042    | Transducer of differential pressure<br>(-50 to + 150) Pa              | measurement of pressure<br>inside the test furnace |
| F 54 020              | Digital calliper (0 to 200) mm                                        | -                                                  |
| F 54 056              | Racking meter                                                         | -                                                  |
| F 69 009              | PLC system for data acquisition and climate<br>control TECOMAT TC 604 | -                                                  |
| F 60 001 - F 60 009   | Sensors of temperature and relative air humidity                      | measurement of climatic<br>conditions              |



| Identification number | Measuring equipment                 | Note                                                                      |
|-----------------------|-------------------------------------|---------------------------------------------------------------------------|
| F 15 521 - F 15 528   | Plate thermometers                  | measurement of temperature inside the test furnace according to EN 1363-1 |
| F 13 701              | Sheathed thermocouple type K Ø 3 mm | measurement of ambient temperature                                        |
| F 57 005              | Digital stop-watch                  | -                                                                         |
| F 96 015              | Test signal panel                   | -                                                                         |

### 3. PREPARATION OF THE SPECIMENS

Testing laboratory noted down production data of the specimens from a certified production. Test specimen data are listed in following table:

|                                                |                                                                                         |
|------------------------------------------------|-----------------------------------------------------------------------------------------|
| Place of production of cable supporting system | Molek Lapidot Ltd., 30 Modiin St., Segula Industrial Zone, 4927176 Petach Tikva, Israel |
| Number of certificate ISO 9001                 | CH07/0979                                                                               |
| Issuing Body                                   | SGS Swiss                                                                               |
| Date of issuing                                | 10. 11. 2017                                                                            |
| Place of production of cables                  | Tele-Fonika Kable S.A., Ul. Hipolita Cegielskiego 1, 32 – 400 Myślenice, Poland         |
| Number of certificate ISO 9001                 | 1400000/QM/UM/12.14                                                                     |
| Issuing Body                                   | VDE Institut                                                                            |
| Date of issuing                                | 31. 03. 2016                                                                            |

Individual components of specimens (consoles, brackets, threaded rods, cables, etc.) were delivered to the testing laboratory by the test sponsor. Assembling of the specimens (assembling of cable supporting systems and mounting of cables and additional weights into the supporting systems) and its installation to supporting construction in test furnace was carried out by representatives of test sponsor under supervision.

### 4. PREPARATION OF THE TEST

#### 4.1 DESCRIPTION OF THE SPECIMENS STRUCTURE

Test specimens comprised of cable supporting system Molek Lapidot (cable trays, mesh trays, ladders with accessories) with power and communication halogen-free cables Tele-Fonika Kable.

#### Cables used by test:

##### Power cables:

Flame-X 950 (N)HXH FE180/E90 0,6/1 kV

##### Communication cables:

Flame-X 950 JE-H(St)H Bd FE180/E90

The length of cables was 5,2 m and 4,0 m from that was exposed to fire.

**Cable supporting systems comprised of following constructions:****Wall tracks No. 1, 2 and 12 (Non-Standard supporting construction):**

Tracks are made of brackets (301 300) fixed to wall in spacing of 1200 mm. Threaded rod grips (340 003) are fixed to opposite end of brackets by two nut bolts (M6x30). Threaded rod (M10) passing through rod grip and is fixed to wall under slope (approx. 45°) by threaded rod hanger (340 006). Threaded rod is fixed to rod hangers by washers and nuts (M10) from above and below.

**Track No. 1:**

Cable trays (214 300, height 60 mm, width 300 mm, steel thickness 1,5 mm) are fixed together by nut bolts (M6x30, 6pcs). Trays are fixed to brackets by two nut bolts (M6x30) and loaded with 10kg.m<sup>-1</sup>. Cables are fixed to cable trays at place of bending by cable clamps.

**Track No. 2:**

Cable mesh trays (180 300, height 85 mm, width 300 mm, steel wires ø 4,0 mm) are fixed together by two connectors (128 003) on sides and connectors (128 002 – 1pc, 128 001 – 2pcs) from below. Mesh trays are fixed to brackets by two connectors (128 001) and loaded with 10kg.m<sup>-1</sup>. Cables are fixed to mesh trays at place of bending by cable clamps and steel plate placed from below.

**Track No. 12:**

Cable ladders (350 400, height 60 mm, width 400 mm, steel sheet thickness 1,5 mm, spacing of transoms 300 mm) are fixed together by two connectors (355 000) and nut bolts (M8x30, 12pcs) on sides. Trays are fixed to brackets by two clamps (398 000) and nut bolts (M8x30) and loaded with 20kg.m<sup>-1</sup>. Cables are fixed to mesh trays at place of bending by cable clamps and steel plate placed from below.

**Suspended tracks No. 3 – 5:**

Tracks are made of consoles combined of ceiling head plate (301 001) and support (301 010) fixed together by nut bolts (M8x60). Consoles are fixed to ceiling in spacing of 1200 mm. Brackets (301 301 – tracks no. 3 and 4; 301 401 – track no. 5) are fixed to supports by integrated fixing system. Threaded rod grips (340 002) are fixed to opposite end of brackets by two nut bolts (M6x30). Threaded rod (M10) passing through rod grips and is fixed to ceiling by fixing hanger (340 001). Threaded rod is fixed to rod grips by washers and nuts (M10) from below and above.

**Track No. 3 (Standard supporting construction):**

Cable trays (214 300, height 60 mm, width 300 mm, steel thickness 1,5 mm) are fixed together by nut bolts (M6x30, 6pcs). Trays are fixed to brackets by two nut bolts (M6x30) and loaded with 10kg.m<sup>-1</sup>. Cables are fixed to cable trays at place of bending by cable clamps.

**Track No. 4 (Non-Standard supporting construction):**

Cable mesh trays (180 300, height 85 mm, width 300 mm, steel wires ø 4,0 mm) are fixed together by two connectors (128 003) on sides and connectors (128 002 – 1pc, 128 001 – 2pcs) from below. Mesh trays are fixed to brackets by two connectors (128 001) and loaded with 10kg.m<sup>-1</sup>. Cables are fixed to mesh trays at place of bending by cable clamps and steel plate placed from below.

**Track No. 5 (Standard supporting construction):**

Cable ladders (350 400, height 60 mm, width 400 mm, steel sheet thickness 1,5 mm, spacing of transoms 300 mm) are fixed together by two connectors (355 000) and nut bolts (M8x30, 12pcs) on sides. Trays are fixed to brackets by two clamps (398 000) and nut bolts (M8x30) and loaded with 20kg.m<sup>-1</sup>. Cables are fixed to mesh trays at place of bending by cable clamps and steel plate placed from below.

**Suspended tracks No. 6 – 8 (Non-standard supporting construction):**

Tracks are made of consoles combined of ceiling head plate (397 002) and support (397 000) fixed together by nut bolts (M12x90). Consoles are fixed to ceiling in spacing of 1200 mm. Brackets (397 400 – track no. 6 and 397 300 – tracks no. 7 and 8) are fixed to supports by two nut bolts (M12x100). Consoles are reinforced by spacers (397 004) at place of fixation of brackets to console.

**Track No. 6:**

Cable ladders (350 400, height 60 mm, width 400 mm, steel sheet thickness 1,5 mm, spacing of transoms 300 mm) are fixed together by two connectors (355 000) and nut bolts (M8x30, 12pcs) on sides. Trays are to brackets by two clamps (398 000) and nut bolts (M8x30) and loaded with  $20\text{kg.m}^{-1}$ . Cables are fixed to mesh trays at place of bending by cable clamps and steel plate placed from below.

**Track No. 7:**

Cable trays (214 300, height 60 mm, width 300 mm, steel thickness 1,5 mm) are fixed together by nut bolts (M6x30, 6pcs). Trays are fixed to brackets by two nut bolts (M6x30) and loaded with  $10\text{kg.m}^{-1}$ . Cables are fixed to cable trays at place of bending by cable clamps.

**Track No. 8:**

Cable mesh trays (180 300, height 85 mm, width 300 mm, steel wires  $\varnothing$  4,0 mm) are fixed together by two connectors (128 003) on sides and connectors (128 002 – 1pc, 128 001 – 2pcs) from below. Mesh trays are fixed to brackets by two connectors (128 001) and loaded with  $10\text{kg.m}^{-1}$ . Cables are fixed to mesh trays at place of bending by cable clamps and steel plate placed from below.

**Suspended tracks No. 9 – 11:**

Tracks are made of consoles combined of ceiling head plate (397 002) and support (397 000) fixed together by nut bolts (M12x90). Consoles are fixed to ceiling in spacing of 1200 mm. Brackets (397 300 – track no. 9 and 397 400 – tracks no. 10 and 11) are fixed to supports by two nut bolts (M12x100). Consoles are reinforced by spacers (397 004) at place of fixation of brackets to console. Threaded rod grips (340 002) are fixed to opposite end of brackets by two nut bolts (M6x30). Threaded rod (M10) passing through rod grips and is fixed to ceiling by fixing hanger (340 001). Threaded rod is fixed to rod grips by washers and nuts (M10) from below and above.

**Track No. 9 (Standard supporting construction):**

Cable trays (214 300, height 60 mm, width 300 mm, steel thickness 1,5 mm) are fixed together by nut bolts (M6x30, 6pcs). Trays are fixed to brackets by two nut bolts (M6x30) and loaded with  $10\text{kg.m}^{-1}$ . Cables are fixed to cable trays at place of bending by cable clamps.

**Track No. 10 (Standard supporting construction):**

Cable ladders (360 400, height 68 mm, width 400 mm, steel sheet thickness 2,5 mm, spacing of transoms 300 mm) are fixed together by two connectors (364 070) and nut bolts (M8x30, 12pcs) on sides. Trays are to brackets by two clamps (398 000) and nut bolts (M8x30) and loaded with  $20\text{kg.m}^{-1}$ . Cables are fixed to mesh trays at place of bending by cable clamps and steel plate placed from below.

**Track No. 11 (Standard supporting construction):**

Cable ladders (350 400, height 60 mm, width 400 mm, steel sheet thickness 1,5 mm, spacing of transoms 300 mm) are fixed together by two connectors (355 000) and nut bolts (M8x30, 12pcs) on sides. Trays are to brackets by two clamps (398 000) and nut bolts (M8x30) and loaded with  $20\text{kg.m}^{-1}$ . Cables are fixed to mesh trays at place of bending by cable clamps and steel plate placed from below.

**Wall track No. 13 (Non-Standard supporting construction):**

Track is made of brackets (397 400) fixed to wall in spacing of 1200 mm. Threaded rod grips (340 003) are fixed to opposite end of brackets by two nut bolts (M6x30). Threaded rod (M10) passing through rod grip and is fixed to wall under slope (approx.  $45^\circ$ ) by threaded rod hanger (340 006). Threaded rod is fixed to rod hangers by washers and nuts (M10) from above and below.

Cable ladders (370 400, height 68 mm, width 400 mm, steel sheet thickness 2,5 mm, spacing of transoms 300 mm) are fixed together by two connectors (364 070) and nut bolts (M8x30, 12pcs) on sides. Trays are to brackets by two clamps (398 000) and nut bolts (M8x30) and loaded with  $20\text{kg.m}^{-1}$ . Cables are fixed to mesh trays at place of bending by cable clamps and steel plate placed from below.

All parts of cable supporting systems are made of galvanized steel.

Steel chains were used for additional loading of tracks.



More detailed information about the construction of the specimens is shown in the drawings which are a part of this test report. Drawings were delivered by the 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 to the specimen verification. Parameters which were verified are quoted in paragraph 4.3.

## 4.2 DESCRIPTION OF THE SPECIMENS FIXATION

The test specimens are fixed to the ceiling of the test furnace created of aerated concrete panels (YTONG) with cross-section dimensions (600 x 250) mm (width x thickness) – 7 pieces. Side walls of test furnace are made of aerated concrete blocks YTONG, 250 mm thick.

Inner dimensions of test furnace are (4000 x 3000 x 3000) mm (length x width x height).

Cable penetration through the wall of test furnace was sealed by mineral wool and sprayed insulation material Tecwool.

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

## 4.3 VERIFICATION OF THE SPECIMENS

The conformity of the drawings and the test specimens was verified before and after the fire resistance test. It was possible to carry out this verification on the test specimen. The specimens corresponded to the drawings which are a part of this test report. The visual review of the test specimens, the used materials as well as the size verification of basic dimensions and the specimens' attachment to the supporting construction were subject to this verification.

## 4.4 CLIMATIC CONDITIONING OF THE SPECIMENS

Test specimens were stored in the hall of the testing laboratory under the following climatic conditions:

Ambient air temperature [°C]

|                    |      |
|--------------------|------|
| mean               | 23,1 |
| standard deviation | 1,0  |

Relative air humidity [%]

|                    |      |
|--------------------|------|
| mean               | 45,0 |
| standard deviation | 3,1  |

## 5. CARRYING OUT OF THE TEST

### 5.1 CONDITIONS OF THE TEST

Conditions during the test in the test furnace (temperature – standard temperature/time curve, pressure, O<sub>2</sub> content) as well as in the testing room (ambient temperature) corresponded to EN 1363-1. Detailed information is a part of this test report, or can be found in the test record.

Values characterizing the testing room environment directly before the test:

|                                     |
|-------------------------------------|
| <b>Ambient air temperature [°C]</b> |
| 24,1                                |



## 5.2 RESULTS OF THE TEST

Measured values are stated in this test report. Description of the specimens' behaviour during the tests:

| Time<br>[min:s] | Observation                                   |
|-----------------|-----------------------------------------------|
| 30:00           | gradual deflection of the supporting systems; |
| 60:00           | gradual deflection of the supporting systems; |
| 90:00           | gradual deflection of the supporting systems; |
| 93:20           | termination of the test.                      |

Deflection of cable support system was not measured.

## 6. CLOSING

Evaluation of the test:

| Specime<br>n No. | Cables                                              | Track<br>No. | Time to first failure / interruption of<br>conductor |
|------------------|-----------------------------------------------------|--------------|------------------------------------------------------|
| 1                | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 13           | 52 minutes                                           |
| 2                | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 3                | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 12           | 66 minutes                                           |
| 4                | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 5                | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 11           | 50 minutes                                           |
| 6                | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 7                | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 10           | 51 minutes                                           |
| 8                | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 9                | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 9            | 61 minutes                                           |
| 10               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 11               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 8            | 50 minutes                                           |
| 12               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 13               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 7            | 73 minutes                                           |
| 14               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 15               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 6            | 59 minutes                                           |
| 16               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 17               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 5            | 49 minutes                                           |
| 18               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 19               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 4            | 69 minutes                                           |
| 20               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 21               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 3            | 84 minutes                                           |
| 22               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 23               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 2            | 87 minutes                                           |
| 24               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 25               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x1,5RE 1kV | 1            | 84 minutes                                           |
| 26               | 2 cables Flame-X 950 (N)HXH-O FE180/E90 4x50RM 1kV  |              | 90 minutes no failure / interruption                 |
| 52               | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8              | 13           | 90 minutes no failure / interruption                 |
| 53               | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8              | 12           | 90 minutes no failure / interruption                 |
| 54               | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8              | 11           | 90 minutes no failure / interruption                 |
| 55               | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8              | 10           | 90 minutes no failure / interruption                 |



| Specimen No. | Cables                                 | Track No. | Time to first failure / interruption of conductor |
|--------------|----------------------------------------|-----------|---------------------------------------------------|
| 56           | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8 | 9         | 90 minutes no failure / interruption              |
| 57           | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8 | 8         | 90 minutes no failure / interruption              |
| 58           | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8 | 7         | 90 minutes no failure / interruption              |
| 59           | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8 | 6         | 77 minutes                                        |
| 60           | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8 | 5         | 90 minutes no failure / interruption              |
| 61           | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8 | 4         | 90 minutes no failure / interruption              |
| 62           | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8 | 3         | 90 minutes no failure / interruption              |
| 63           | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8 | 2         | 90 minutes no failure / interruption              |
| 64           | 2 cables Flame-X 950 JE-H(St)H 1x2x0,8 | 1         | 90 minutes no failure / interruption              |

The fire test was terminated in the 93<sup>rd</sup> minute upon request of test sponsor.

Specimens S1 – S26 were tested by three-phase voltage supply 3 x 230/400V with bulbs 240V / 60 W.  
Specimens S52 – S64 were tested by one-phase voltage supply 1 x 110V with LED diodes 3V /0,03W.

Circuit breakers with rating 3 A were used.

## 7. DIRECT APPLICATION OF TEST RESULTS

Direct field of application is valid in accordance with STN 92 0205: 2014 (cl. 7), ČSN 73 0895: 2016 (cl. 8) and DIN 4102-12: 1998-11 (clause 8). Validity of individual items of field of direct application shall be determined in classification process.



## Measured values inside the test furnace

| Time<br>t [min] | Temperature [°C] |        |        |        |        |        |        |        |        |        |      | Deviation          | Pressure [Pa] |
|-----------------|------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|--------------------|---------------|
|                 | Td1              | Td2    | Td3    | Td4    | Td5    | Td6    | Td7    | Td8    | Tave   | Tn     | To   | d <sub>e</sub> [%] | p             |
| 0               | 25,2             | 26,2   | 25,2   | 27,4   | 27,8   | 28,5   | 27,5   | 26,1   | 26,7   | 20,0   | 24,1 | 0,0                | -0,1          |
| 5               | 523,3            | 546,1  | 589,2  | 547,1  | 515,3  | 525,5  | 569,8  | 579,3  | 549,5  | 576,0  | 24,2 | -4,8               | 18,0          |
| 10              | 734,8            | 714,1  | 650,6  | 696,3  | 753,1  | 732,7  | 642,1  | 712,8  | 704,6  | 678,0  | 24,2 | -1,1               | 19,0          |
| 15              | 786,1            | 783,4  | 721,2  | 771,1  | 805,3  | 822,2  | 707,8  | 770,9  | 771,0  | 739,0  | 24,3 | 0,8                | 18,5          |
| 20              | 797,1            | 808,9  | 788,1  | 802,9  | 813,8  | 838,9  | 760,9  | 799,7  | 801,3  | 781,0  | 24,3 | 1,6                | 19,6          |
| 25              | 798,1            | 835,7  | 864,3  | 835,1  | 809,6  | 839,6  | 830,0  | 824,0  | 829,6  | 815,0  | 24,4 | 1,8                | 18,6          |
| 30              | 833,7            | 876,6  | 902,2  | 868,8  | 832,1  | 860,6  | 869,2  | 856,0  | 862,4  | 842,0  | 24,4 | 1,7                | 18,9          |
| 35              | 867,5            | 913,9  | 919,7  | 900,2  | 864,3  | 902,0  | 884,6  | 883,8  | 892,0  | 865,0  | 24,5 | 1,9                | 19,4          |
| 40              | 887,9            | 921,7  | 930,8  | 917,4  | 887,8  | 923,0  | 907,6  | 902,2  | 909,8  | 885,0  | 24,5 | 2,1                | 17,7          |
| 45              | 862,9            | 901,8  | 947,6  | 907,1  | 868,8  | 890,9  | 928,5  | 893,1  | 900,1  | 902,0  | 24,6 | 1,9                | 19,4          |
| 50              | 886,6            | 917,1  | 955,1  | 922,1  | 887,8  | 903,9  | 945,3  | 909,8  | 916,0  | 918,0  | 24,6 | 1,7                | 19,4          |
| 55              | 910,9            | 922,6  | 923,0  | 926,8  | 914,2  | 931,7  | 926,2  | 916,0  | 921,4  | 932,0  | 24,7 | 1,4                | 17,3          |
| 60              | 933,2            | 942,6  | 931,8  | 936,6  | 929,2  | 942,0  | 925,2  | 931,4  | 934,0  | 945,0  | 24,7 | 1,2                | 19,4          |
| 65              | 959,7            | 968,6  | 965,1  | 958,9  | 948,2  | 958,7  | 949,4  | 957,7  | 958,3  | 957,0  | 24,8 | 1,0                | 18,4          |
| 70              | 962,2            | 977,9  | 979,0  | 971,8  | 955,4  | 968,2  | 969,3  | 965,5  | 968,7  | 968,0  | 24,8 | 1,0                | 18,4          |
| 75              | 978,5            | 994,8  | 992,6  | 986,8  | 970,7  | 985,8  | 979,9  | 980,6  | 983,7  | 979,0  | 24,9 | 0,9                | 18,3          |
| 80              | 996,4            | 1015,7 | 1006,6 | 1005,4 | 989,5  | 1005,7 | 994,9  | 997,5  | 1001,5 | 988,0  | 24,9 | 0,9                | 19,8          |
| 85              | 1001,4           | 1021,0 | 1018,0 | 1013,6 | 997,3  | 1011,3 | 1008,5 | 1005,6 | 1009,6 | 997,0  | 25,0 | 0,9                | 17,0          |
| 90              | 1008,0           | 1019,8 | 1020,0 | 1014,2 | 1003,1 | 1011,7 | 1011,1 | 1010,4 | 1012,3 | 1006,0 | 25,1 | 0,9                | 18,6          |
| 91              | 1005,5           | 1021,8 | 1023,5 | 1016,4 | 1004,0 | 1013,2 | 1014,1 | 1011,0 | 1013,7 | 1008,0 | 25,1 | 0,9                | 18,3          |
| 92              | 1007,5           | 1013,2 | 1009,1 | 1009,8 | 999,8  | 1008,8 | 1007,5 | 1005,5 | 1007,7 | 1009,0 | 25,1 | 0,9                | 18,9          |

**Tave** Average temperature in the test furnace calculated from individual thermometers

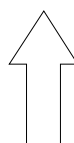
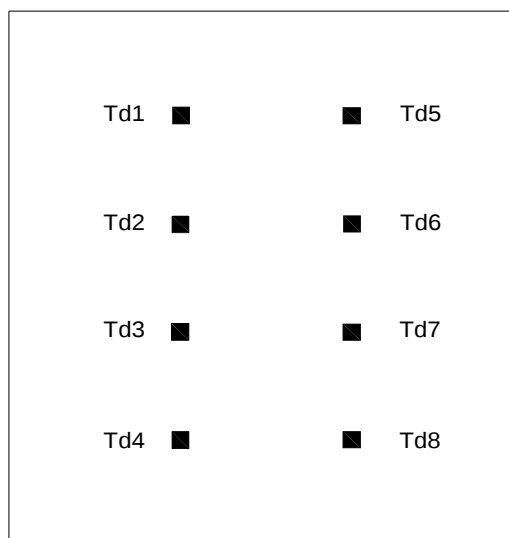
**Tn** Standard temperature in the test furnace laid down according to test guideline

**d<sub>e</sub>** Deviation of the average temperature from the standard temperature calc. acc. to test guideline

**To** Ambient temperature

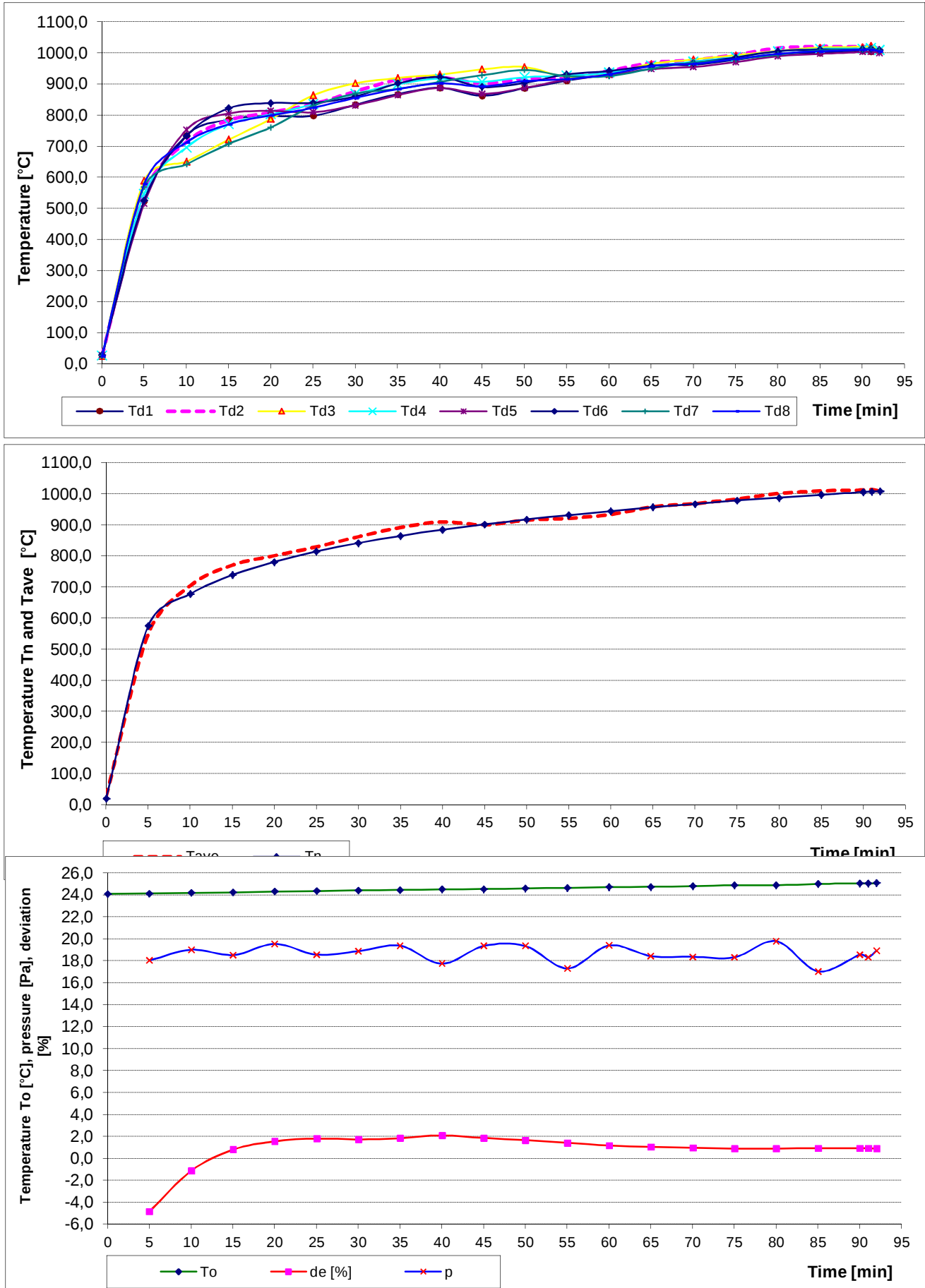
**p1** Pressure inside the test furnace measured under the ceiling of test furnace

Layout of measuring points in the test furnace:



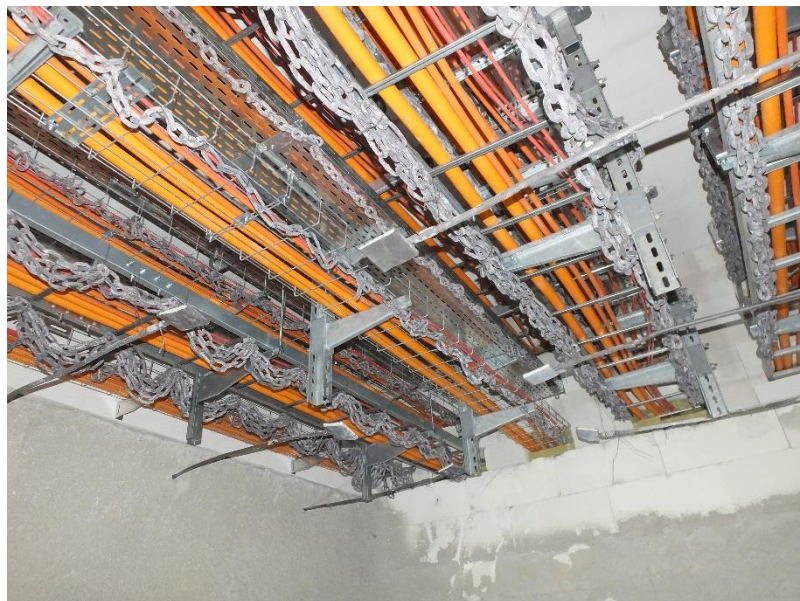


Measured values inside the test furnace /graph





**PHOTOS TAKEN BEFORE THE TEST**



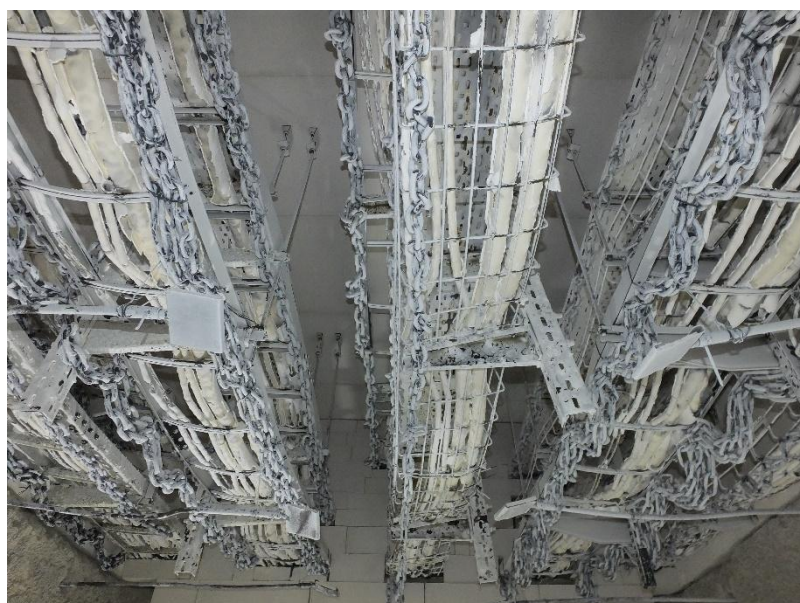
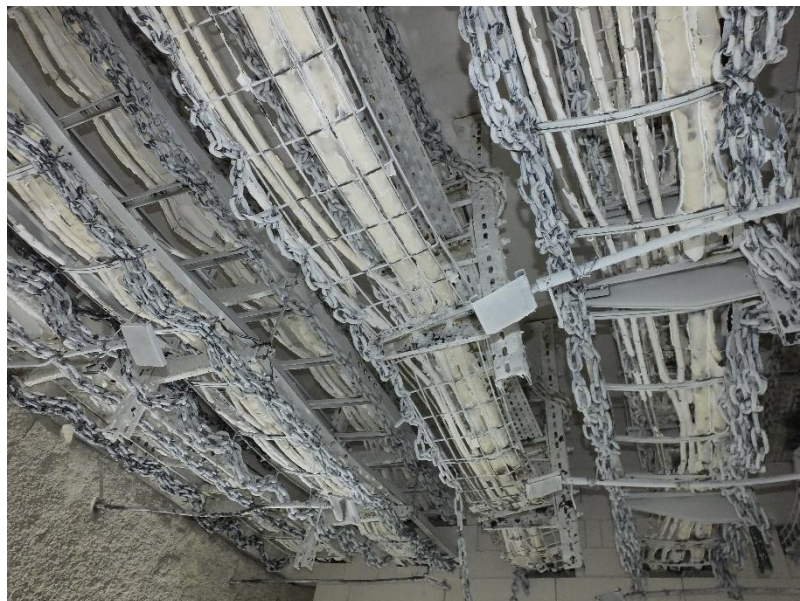


**PHOTOS TAKEN BEFORE THE TEST**





**PHOTOS TAKEN AFTER THE TEST**





**PHOTOS TAKEN AFTER THE TEST**





## USED CABLES BY TEST

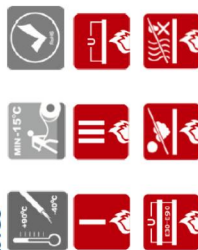
## FLAME-X 950

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

DIN VDE 0266, DIN 4102-12,  
CNBOP-PIB AT-603-0287/2010/2015  
Admission Certificate 1314/2012



## Halogen- free low smoke fire resistant security power cables



| CONSTRUCTION                                    |                                                                                                                                  |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Conductors:                                     | bare copper conductor, circular solid class 1 (RE) or stranded circular or circular compacted class 2 (RM) according to EN 60228 |
| Insulation:                                     | special cross-linked halogen-free fire resistant silicone compound                                                               |
| Inner covering:                                 | special flame-retardant and halogen-free compound                                                                                |
| Sheath:                                         | thermoplastic halogen-free compound type HM4 according to DIN VDE 0276-604                                                       |
| Colour of sheath:                               | orange                                                                                                                           |
| Core identification:                            | according to DIN VDE 0293-308, HD 308 S2 or EN 50334                                                                             |
| (N)HXH-O FE180/E90 without protective conductor |                                                                                                                                  |
| 1-core:                                         | black                                                                                                                            |
| 2-core:                                         | blue, brown                                                                                                                      |
| 3-core:                                         | brown, black, grey                                                                                                               |
| 3-core-*                                        | blue, brown, black                                                                                                               |
| 4-core:                                         | blue, brown, black, grey                                                                                                         |
| 4-core-*                                        | blue, brown, black, grey                                                                                                         |
| 5-core:                                         | blue, brown, black, grey, black                                                                                                  |
| more 5-core:                                    | black with numbering                                                                                                             |
| *For certain applications only.                 |                                                                                                                                  |
| (N)HXH-J FE180/E90 with protective conductor    |                                                                                                                                  |
| 1-core:                                         | green-yellow                                                                                                                     |
| 2-core:                                         | green-yellow, blue, brown                                                                                                        |
| 3-core:                                         | green-yellow, brown, black, grey                                                                                                 |
| 4-core:                                         | green-yellow, blue, brown, black                                                                                                 |
| 5-core:                                         | green-yellow, blue, brown, black, grey                                                                                           |
| more 5-core:                                    | green-yellow, others cores black with numbering                                                                                  |

| CHARACTERISTIC                                             |                                                                                        |
|------------------------------------------------------------|----------------------------------------------------------------------------------------|
| Maximum conductor operating temperature                    | +90°C                                                                                  |
| Lowest ambient temperature for fixed installation:         | -40°C                                                                                  |
| Lowest installation temperature:                           | -15°C                                                                                  |
| Maximum short-circuit conductor temperature:               | +250°C                                                                                 |
| Minimum bending radius:                                    | 15D - for single core cable;<br>12D - for multicore cable (D - overall cable diameter) |
| Maximum permissible tensile stress with cable grip for Cu: | 50 N/mm <sup>2</sup>                                                                   |

FLAME-X 950 (N)HXH FE180-E90 MK-21-01-2016

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## FLAME-X 950

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DIN VDE 0266, DIN 4102-12,  
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Admission Certificate 1314/2012



| FIRE PERFORMANCE                 |                                                                                                    |
|----------------------------------|----------------------------------------------------------------------------------------------------|
| Insulation integrity FE 180:     | DIN VDE 0472-814 (800 °C, 180 min.), IEC 60331-21                                                  |
| System integrity E90:            | DIN 4102-12 (90 min.)                                                                              |
| Flame propagation:               | DIN EN 50266-2-2, VDE 0482-266-2-2, IEC 60332-3-22                                                 |
| Smoke density:                   | DIN EN 61034-2, VDE 0482-1034-2, IEC 61034-2                                                       |
| Gases evolved during combustion: | DIN EN 50267-2-2, VDE 0482-267-2-2, IEC 60754-2:<br>pH ≥ 4,3; conductivity ≤ 10 µSmm <sup>-1</sup> |

## APPLICATIONS

Fire resistant security cables for installation everywhere where high safety requirements have a special significance e.g., in industrial complexes, power stations, public buildings, hotels, underground railway systems, hospitals etc.

|                               |                                                              |
|-------------------------------|--------------------------------------------------------------|
| Standard length cable packing | 500 or 1000m on drums.                                       |
|                               | Other forms of packing and delivery are available on request |

## APPROVALS

SIQ, GOST, VDE, CNBOP

| Number and cross-sectional area of conductor | Approximate overall diameter | Approximate net weight of cables | Maximum conductor resistance at temperature 20°C |
|----------------------------------------------|------------------------------|----------------------------------|--------------------------------------------------|
| n x mm <sup>2</sup>                          | mm                           | kg/km                            | Ω/km                                             |
| 1x1,5RE                                      | 6,4                          | 58                               | 12,1                                             |
| 1x2,5RE                                      | 6,7                          | 70                               | 7,41                                             |
| 1x4RE                                        | 7,2                          | 88                               | 4,61                                             |
| 1x6RE                                        | 7,7                          | 110                              | 3,08                                             |
| 1x10RE                                       | 8,5                          | 153                              | 1,83                                             |
| 1x16RE                                       | 9,6                          | 217                              | 1,15                                             |
| 1x16RM                                       | 10                           | 226                              | 1,15                                             |
| 1x25RM                                       | 11,7                         | 332                              | 0,727                                            |
| 1x35RM                                       | 12,8                         | 430                              | 0,524                                            |
| 1x50RM                                       | 14,5                         | 568                              | 0,387                                            |
| 1x70RM                                       | 15,8                         | 769                              | 0,268                                            |
| 1x95RM                                       | 18,6                         | 1058                             | 0,193                                            |
| 1x120RM                                      | 20                           | 1295                             | 0,153                                            |
| 1x150RM                                      | 22,2                         | 1592                             | 0,124                                            |
| 1x185RM                                      | 24,3                         | 1972                             | 0,0991                                           |
| 1x240RM                                      | 27,4                         | 2543                             | 0,0754                                           |
| 1x300RM                                      | 29,8                         | 3154                             | 0,0601                                           |
| 2x1,5RE                                      | 11,5                         | 186                              | 12,1                                             |
| 2x2,5RE                                      | 12,3                         | 223                              | 7,41                                             |
| 2x2,5RM                                      | 12,8                         | 239                              | 7,41                                             |
| 2x4RE                                        | 13,2                         | 274                              | 4,61                                             |

FLAME-X 950 (N)HXH FE180-E90 MK-21-01-2016

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## USED CABLES BY TEST

## FLAME-X 950

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

DIN VDE 0266, DIN 4102-12,  
CNBOP-PIB AT-603-0287/2010/2015  
Admission Certificate 1314/2012



| Number and cross-sectional area of conductor | Approximate overall diameter | Approximate net weight of cables | Maximum conductor resistance at temperature 20°C |
|----------------------------------------------|------------------------------|----------------------------------|--------------------------------------------------|
| n x mm <sup>2</sup>                          | mm                           | kg/km                            | Ω/km                                             |
| 2x6RE                                        | 14,2                         | 336                              | 3,08                                             |
| 2x10RE                                       | 15,8                         | 454                              | 1,83                                             |
| 2x16RE                                       | 18,6                         | 662                              | 1,15                                             |
| 2x16RM                                       | 19,4                         | 702                              | 1,15                                             |
| 2x25RM                                       | 22,8                         | 1012                             | 0,727                                            |
| 3x1,5RE                                      | 12,1                         | 210                              | 12,1                                             |
| 3x2,5RE                                      | 12,9                         | 255                              | 7,41                                             |
| 3x4RE                                        | 13,9                         | 319                              | 4,61                                             |
| 3x6RE                                        | 14,9                         | 397                              | 3,08                                             |
| 3x10RE                                       | 16,6                         | 549                              | 1,83                                             |
| 3x16RE                                       | 19,6                         | 810                              | 1,15                                             |
| 3x16RM                                       | 20,5                         | 854                              | 1,15                                             |
| 3x25RM                                       | 24,1                         | 1244                             | 0,727                                            |
| 3x35RM                                       | 26,4                         | 1594                             | 0,524                                            |
| 3x50RM                                       | 30,1                         | 2105                             | 0,387                                            |
| 3x70RM                                       | 33,8                         | 2867                             | 0,268                                            |
| 3x95RM                                       | 39,5                         | 3929                             | 0,193                                            |
| 3x120RM                                      | 42,7                         | 4781                             | 0,153                                            |
| 3x150RM                                      | 47,5                         | 5890                             | 0,124                                            |
| 3x185RM                                      | 52                           | 7248                             | 0,0991                                           |
| 3x240RM                                      | 61,4                         | 9622                             | 0,0754                                           |
| 3x25RM+16RM                                  | 25,4                         | 1424                             | 0,727 / 1,15                                     |
| 3x35RM+16RM                                  | 27,3                         | 1785                             | 0,524 / 1,15                                     |
| 3x50RM+25RM                                  | 31,6                         | 2413                             | 0,387 / 0,727                                    |
| 3x70RM+35RM                                  | 35,3                         | 3260                             | 0,268 / 0,524                                    |
| 3x95RM+50RM                                  | 41,3                         | 4481                             | 0,193 / 0,387                                    |
| 3x120RM+70RM                                 | 45,1                         | 5564                             | 0,153 / 0,268                                    |
| 3x150RM+70RM                                 | 49                           | 6648                             | 0,124 / 0,268                                    |
| 3x185RM+95RM                                 | 54,3                         | 8297                             | 0,0991 / 0,193                                   |
| 3x240RM+120RM                                | 61,2                         | 10684                            | 0,0754 / 0,153                                   |
| 4x1,5RE                                      | 13                           | 243                              | 12,1                                             |
| 4x2,5RE                                      | 13,9                         | 299                              | 7,41                                             |
| 4x4RE                                        | 15                           | 379                              | 4,61                                             |
| 4x6RE                                        | 16,2                         | 478                              | 3,08                                             |
| 4x10RE                                       | 18,1                         | 670                              | 1,83                                             |
| 4x16RE                                       | 21,3                         | 991                              | 1,15                                             |
| 4x16RM                                       | 22,3                         | 1042                             | 1,15                                             |
| 4x25RM                                       | 26,4                         | 1530                             | 0,727                                            |

FLAME-X 950 (N)HXH FE180-E90 MK-21-01-2016

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## FLAME-X 950

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

DIN VDE 0266, DIN 4102-12,  
CNBOP-PIB AT-603-0287/2010/2015  
Admission Certificate 1314/2012



| Number and cross-sectional area of conductor | Approximate overall diameter | Approximate net weight of cables | Maximum conductor resistance at temperature 20°C |
|----------------------------------------------|------------------------------|----------------------------------|--------------------------------------------------|
| n x mm <sup>2</sup>                          | mm                           | kg/km                            | Ω/km                                             |
| 4x35RM                                       | 28,9                         | 1989                             | 0,524                                            |
| 4x50RM                                       | 33,6                         | 2689                             | 0,387                                            |
| 4x70RM                                       | 37,3                         | 3623                             | 0,268                                            |
| 4x95RM                                       | 43,7                         | 4973                             | 0,193                                            |
| 4x120RM                                      | 47,6                         | 6116                             | 0,153                                            |
| 4x150RM                                      | 52,8                         | 7498                             | 0,124                                            |
| 4x185RM                                      | 58,2                         | 9303                             | 0,0991                                           |
| 4x240RM                                      | 65,6                         | 11960                            | 0,0754                                           |
| 4x300RM                                      | 71,3                         | 14725                            | 0,0601                                           |
| 4x25RM+16RM                                  | 28                           | 1769                             | 0,727 / 1,15                                     |
| 4x35RM+16RM                                  | 30,2                         | 2218                             | 0,524 / 1,15                                     |
| 4x50RM+25RM                                  | 35,6                         | 3054                             | 0,387 / 0,727                                    |
| 4x70RM+16RM                                  | 37,8                         | 3877                             | 0,268/1,15                                       |
| 4x70RM+35RM                                  | 39,3                         | 4084                             | 0,268 / 0,524                                    |
| 4x120RM+70RM                                 | 50,5                         | 6987                             | 0,153 / 0,268                                    |
| 4x150RM+70RM                                 | 55,1                         | 8399                             | 0,124 / 0,268                                    |
| 4x185RM+95RM                                 | 61,4                         | 10527                            | 0,0991 / 0,193                                   |
| 4x240RM+120RM                                | 68,8                         | 13476                            | 0,0754 / 0,153                                   |
| 5x1,5RE                                      | 14                           | 286                              | 12,1                                             |
| 5x2,5RE                                      | 15                           | 356                              | 7,41                                             |
| 5x4RE                                        | 16,3                         | 455                              | 4,61                                             |
| 5x6RE                                        | 17,6                         | 577                              | 3,08                                             |
| 5x10RE                                       | 19,7                         | 815                              | 1,83                                             |
| 5x16RE                                       | 23,2                         | 1205                             | 1,15                                             |
| 5x16RM                                       | 24,3                         | 1267                             | 1,15                                             |
| 5x25RM                                       | 28,9                         | 1874                             | 0,727                                            |
| 5x35RM                                       | 31,9                         | 2437                             | 0,524                                            |
| 5x50RM                                       | 37,3                         | 3311                             | 0,387                                            |
| 5x70RM                                       | 41,2                         | 4448                             | 0,268                                            |
| 5x95RM                                       | 48,6                         | 6157                             | 0,193                                            |
| 5x120RM                                      | 52,6                         | 7515                             | 0,153                                            |
| 5x150RM                                      | 59                           | 9317                             | 0,124                                            |
| 5x185RM                                      | 64,5                         | 11470                            | 0,0991                                           |
| 5x240RM                                      | 72,7                         | 14750                            | 0,0754                                           |
| 7x1,5RE                                      | 15,1                         | 341                              | 12,1                                             |
| 7x2,5RE                                      | 16,2                         | 430                              | 7,41                                             |
| 7x4RE                                        | 17,6                         | 558                              | 4,61                                             |
| 7x4RM                                        | 18,5                         | 595                              | 4,61                                             |

FLAME-X 950 (N)HXH FE180-E90 MK-21-01-2016

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## USED CABLES BY TEST

## FLAME-X 950

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

DIN VDE 0266, DIN 4102-12,

CNBOP-PIB AT-603-0287/2010/2015

Admission Certificate 1314/2012



| Number and cross-sectional area of conductor | Approximate overall diameter | Approximate net weight of cables | Maximum conductor resistance at temperature 20°C |
|----------------------------------------------|------------------------------|----------------------------------|--------------------------------------------------|
| n x mm <sup>2</sup>                          | mm                           | kg/km                            | Ω/km                                             |
| 19                                           |                              |                                  | 0,45                                             |
| 24                                           |                              |                                  | 0,40                                             |
| 40                                           |                              |                                  | 0,35                                             |
| 61                                           |                              |                                  | 0,30                                             |

## FLAME-X 950

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

DIN VDE 0266, DIN 4102-12,

CNBOP-PIB AT-603-0287/2010/2015

Admission Certificate 1314/2012



|    |      |
|----|------|
| 19 | 0,45 |
| 24 | 0,40 |
| 40 | 0,35 |
| 61 | 0,30 |

## Current ratings as defined in DIN VDE 0276-604, HD 604 S1-5G and DIN VDE 0276-627, HD 627 S1-7H

Operating temperature at conductor 90°C

Ambient air temperature 30°C

Installation: single multicore cable and three single core cables

| Installation                   | 1)   | 1   | 3   | 3   |
|--------------------------------|------|-----|-----|-----|
| Number of loaded cores         |      |     |     |     |
| Cross-section, mm <sup>2</sup> |      |     |     |     |
| 1.5                            | 33   | 24  | 24  | 26  |
| 2.5                            | 43   | 32  | 32  | 34  |
| 4                              | 57   | 42  | 42  | 44  |
| 6                              | 72   | 53  | 53  | 56  |
| 10                             | 99   | 74  | 74  | 77  |
| 16                             | 131  | 98  | 98  | 102 |
| 25                             | 177  | 133 | 133 | 138 |
| 35                             | 217  | 162 | 162 | 170 |
| 50                             | 265  | 197 | 197 | 207 |
| 70                             | 336  | 250 | 250 | 263 |
| 95                             | 415  | 308 | 308 | 325 |
| 120                            | 485  | 359 | 359 | 380 |
| 150                            | 557  | 412 | 412 | 437 |
| 185                            | 646  | 475 | 475 | 507 |
| 240                            | 774  | 564 | 564 | 604 |
| 300                            | 901  | 649 | 649 | 697 |
| 400                            | 1060 | -   | -   | 811 |
| 500                            | 1252 | -   | -   | 940 |

1) Rated current for direct current systems with a far-distanced return conductor.

## Current ratings for control cables – DIN VDE 0276-627, HD 627 S1-7H:

Conversion factors for multicore cable (≥ 5 cores)

The conversion factors are to be used for laying the cables in air (col. 3), to the values given in above tables

| Number of loaded cores | Laying in air |
|------------------------|---------------|
| 5                      | 0,75          |
| 7                      | 0,65          |
| 10                     | 0,55          |
| 14                     | 0,50          |

FLAME-X 950 (N)HXH FE180-E90 MK-21-01-2016

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## Current ratings - DIN VDE 0298-4 and IEC 60364-5-523

Ambient temperature: 30°C

Conductor operating temperature: 90°C

Installation: in free air for fixed installation within buildings: in walls, on wall, ladder or cable trays

| Installation method <sup>1</sup> | A2                                                                 | B2                                                               | C                                                                 | E                                                                 |
|----------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|
|                                  |                                                                    |                                                                  |                                                                   |                                                                   |
|                                  | Multicore cables in insulating tubes, in thermally insulated walls | Multicore cables in insulating tubes on a wall                   | Single- or multicore cables on a wall                             | Multicore cables with a space of minimum 0,3 x diameter d to wall |
| Number of loaded cores           | 2 3                                                                | 2 3                                                              | 2 3                                                               | 2 3                                                               |
| Cross-section mm <sup>2</sup>    | 18,5 16,5 22 30 30 40 42 51 57 68 89 109 121 145 164 183 220 253   | 22 30 40 51 69 80 91 119 146 175 221 265 305 352 410 440 480 540 | 24 33 45 58 71 86 107 138 171 209 269 328 382 440 490 540 600 660 | 26 36 49 63 75 86 115 149 185 225 289 352 410 460 510 560 620     |

FLAME-X 950 (N)HXH FE180-E90 MK-21-01-2016

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USED CABLES BY TEST

FLAME-X 950

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

DIN VDE 0266, DIN 4102-12,  
CNBOP-PIB AT-603-0287/2010/2015  
Admission Certificate 1314/2012

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FLAME-X 950

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

DIN VDE 0266, DIN 4102-12,  
CNBOP-PIB AT-603-0287/2010/2015  
Admission Certificate 1314/2012

|       |       |       |       |       |       |       |        |        |
|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| 150   | 290   | 259   | —     | —     | 441   | 371   | 473    | 399    |
| 185   | 329   | 295   | —     | —     | 506   | 424   | 542    | 456    |
| 240   | 386   | 346   | —     | —     | 599   | 500   | 641    | 538    |
| Table | 52-C2 | 52-C4 | 52-C2 | 52-C4 | 52-C2 | 52-C4 | 52-C11 | 52-C11 |

Current ratings for single core sheathed cables in free air.  
Ambient temperature 30°C, conductor operating temperature 90°C  
Single core sheathed cables with a space of minimum 1 x diameter (D) to wall.

| Installation method            | F                             |        |        | G      |        |        |
|--------------------------------|-------------------------------|--------|--------|--------|--------|--------|
|                                | Touching                      |        |        | Spaced |        |        |
|                                |                               |        |        |        |        |        |
| Number of loaded cores         | 2                             | 3      | 3      | 3      | 3      | 3      |
| Cross-section /mm <sup>2</sup> | Current ratings in Ampere (A) |        |        |        |        |        |
| 25                             | 161                           | 141    | 135    | 182    | 161    | 161    |
| 35                             | 200                           | 176    | 169    | 226    | 201    | 201    |
| 50                             | 242                           | 216    | 207    | 275    | 246    | 246    |
| 70                             | 310                           | 279    | 268    | 353    | 318    | 318    |
| 95                             | 377                           | 342    | 328    | 430    | 389    | 389    |
| 120                            | 437                           | 400    | 383    | 500    | 454    | 454    |
| 150                            | 504                           | 464    | 444    | 577    | 527    | 527    |
| 185                            | 575                           | 533    | 510    | 661    | 605    | 605    |
| 240                            | 679                           | 634    | 607    | 781    | 719    | 719    |
| 300                            | 783                           | 736    | 703    | 902    | 833    | 833    |
| Table                          | 52-C11                        | 52-C11 | 52-C11 | 52-C11 | 52-C11 | 52-C11 |

FLAME-X 950 (N)HXH FE180-E90 MK-21-01-2016  
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FLAME-X 950 (N)HXH FE180-E90 MK-21-01-2016  
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Adapted to DIN VDE 0815  
TT1-6644 v.3 11.01.2016

|                                 |                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Insulation integrity FE 180     | DIN VDE 0472-814 (800°C, 180 minutes), IEC 60331                                                                   |
| System integrity E90            | DIN VDE 4102-12 (90 min.)                                                                                          |
| Flame retardant                 | VDE 0482-266-2-4, DIN EN 60332-3-24<br>( IEC 60332-3 Category C)                                                   |
| Smoke density                   | VDE 0482-1034-2, DIN EN 61034-2<br>(IEC 61034-2: light transmittance values > 60%)                                 |
| Gases evolved during combustion | VDE 0482-267-2-2, DIN EN 50267-2-2<br>(IEC 60754-2: pH > 3.5; conductivity <100 $\mu\text{S}\cdot\text{cm}^{-1}$ ) |

| Number pairs and diameter of conductor | Nominal thickness of insulation | Minimum thickness of sheath | Approximate overall diameter | Approximate net weight of cable |
|----------------------------------------|---------------------------------|-----------------------------|------------------------------|---------------------------------|
| n x 2 x mm                             | mm                              | mm                          | mm                           | kg/km                           |
| 1 x 2 x 0.8                            | 0.7                             | 1.2                         | 7.6                          | 66.4                            |
| 2 x 2 x 0.8                            | 0.7                             | 1.2                         | 8.5                          | 90.4                            |
| 4 x 2 x 0.8                            | 0.7                             | 1.2                         | 12.6                         | 154.8                           |

Fire resistant, halogen-free static screened installation cables for telecommunication purpose. The static screen prevents strong interference impulse. Suitable for fixed installation everywhere, where in case of fire human life and material assets are to be protected, e.g. in industrial complexes, public buildings, hotels, airports, underground railway networks, hospitals. Not for purposes of high current and power installation.

500 m on drums. Other forms of packing and delivery are available on request.



| Conductors                              | Bare solid copper conductor 0,8mm                                                                                                                                                                                                                                                      |          |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|--------|---|------|-----|---|------|--------|---|-------|-------|---|-------|-------|
| Insulation:                             | Halogen-free cross-linked compound type E18(90°C) acc. EN 50363-5                                                                                                                                                                                                                      |          |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| Colours of insulation for 4 pairs units | <table border="1"> <tr> <th>Pair no.</th><th>wire A</th><th>wire B</th></tr> <tr> <td>1</td><td>blue</td><td>red</td></tr> <tr> <td>2</td><td>grey</td><td>yellow</td></tr> <tr> <td>3</td><td>green</td><td>brown</td></tr> <tr> <td>4</td><td>white</td><td>black</td></tr> </table> | Pair no. | wire A | wire B | 1 | blue | red | 2 | grey | yellow | 3 | green | brown | 4 | white | black |
| Pair no.                                | wire A                                                                                                                                                                                                                                                                                 | wire B   |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| 1                                       | blue                                                                                                                                                                                                                                                                                   | red      |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| 2                                       | grey                                                                                                                                                                                                                                                                                   | yellow   |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| 3                                       | green                                                                                                                                                                                                                                                                                  | brown    |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| 4                                       | white                                                                                                                                                                                                                                                                                  | black    |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
|                                         | Two-pair cables shall be cabled in quad formation and colour coded: blue, red, grey, yellow                                                                                                                                                                                            |          |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| Biding tapes of cable core              | Colourless                                                                                                                                                                                                                                                                             |          |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| Cable core wrapping                     | Polyester tape                                                                                                                                                                                                                                                                         |          |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| Screen                                  | AL/PET tape                                                                                                                                                                                                                                                                            |          |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| Drain wire                              | Solid tinned annealed copper wire 0,8mm                                                                                                                                                                                                                                                |          |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| Sheath                                  | thermoplastic halogen-free, flame retardant compound acc. to EN 50290-2-27 (70°C)                                                                                                                                                                                                      |          |        |        |   |      |     |   |      |        |   |       |       |   |       |       |
| Colour of sheath                        | Grey, orange or red.                                                                                                                                                                                                                                                                   |          |        |        |   |      |     |   |      |        |   |       |       |   |       |       |

| Electrical parameters at 20°C   |  | Unit    | Value                                                              |
|---------------------------------|--|---------|--------------------------------------------------------------------|
| Loop resistance of 1km(max)     |  | Ω/km    | 73.2                                                               |
| Resistance of insulation (min)  |  | MΩ*km   | 100                                                                |
| Mutual capacitance (min)        |  | nF/km   | 120                                                                |
|                                 |  |         | ( this values may be extended at 20% with a make-up up to 4 pairs) |
| Capacitance unbalance (k) (max) |  | pF/100m | 200                                                                |
| Test voltage                    |  |         | (20% of the values, but one value up to 400 pF is allowed)         |
|                                 |  | V       | Core-core: 500V<br>Core-screen: 2000V                              |
| Operating voltage               |  | V       | max. 225V                                                          |
|                                 |  |         | (not for purposes of high current and power installation)          |
| Temperature range               |  |         | Flexing: -5°C to 50°C                                              |
|                                 |  | °C      | Flexing: -30°C to 70°C                                             |
| Maximum bending radius          |  | mm      | 7.5xD: D - overall diameter of the cable                           |

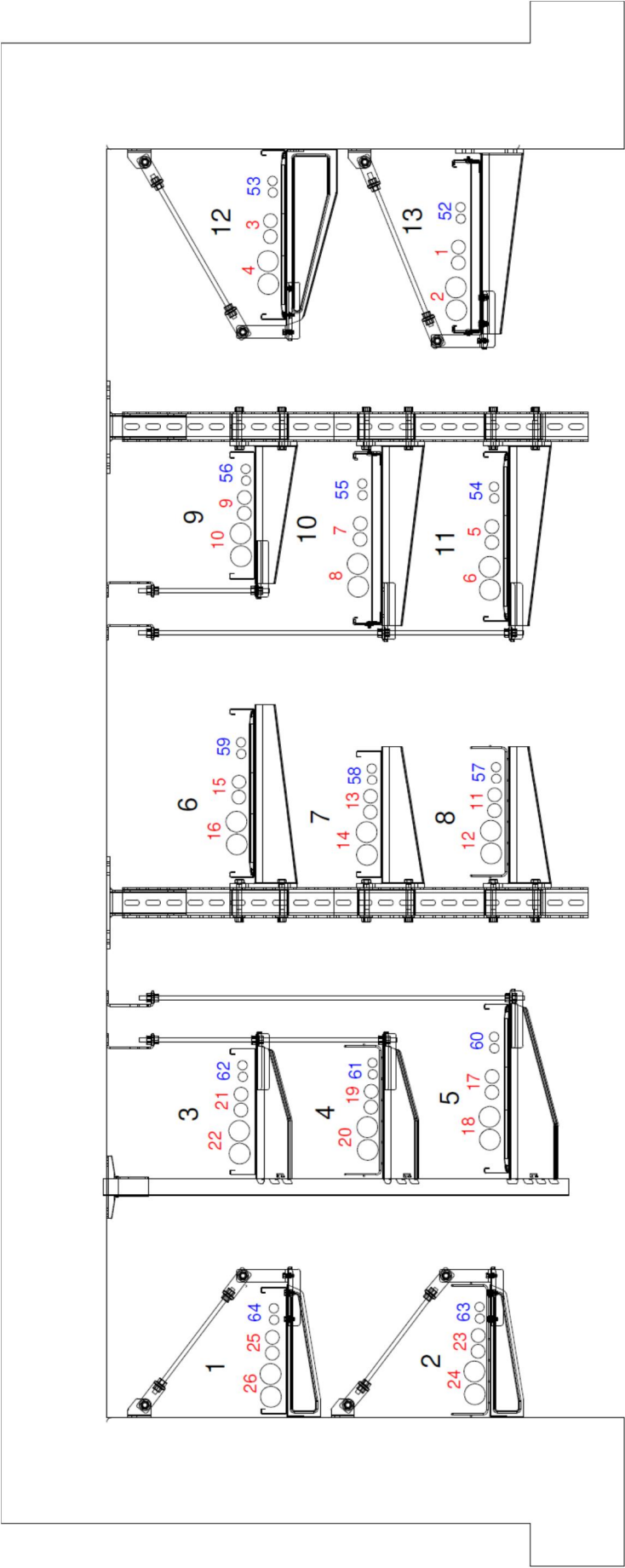
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DRAWINGS

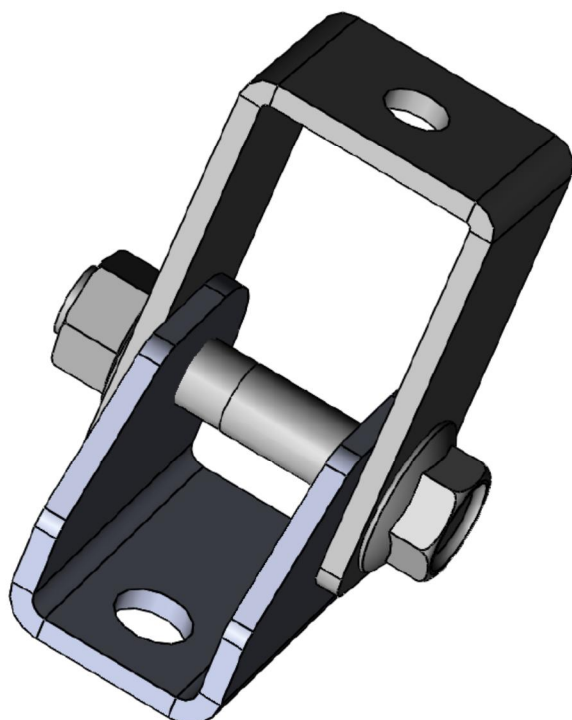


FIRE TEST - CABLES ABOVE CABLE SUPPORT SYSTEMS

[illegible]



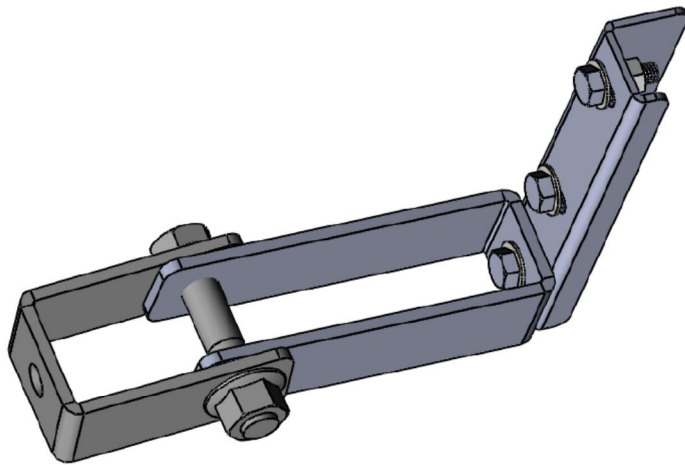
## DRAWINGS



|                                                                                                                      |  |              |           |                    |         |            |               |        |  |
|----------------------------------------------------------------------------------------------------------------------|--|--------------|-----------|--------------------|---------|------------|---------------|--------|--|
| MOLEK LAPIDOT<br>Accessories for Electricity, Communication & Water<br>Metal Sheet Processing & Electronic Packaging |  | DWG NO.      |           | 340006             |         |            |               | Title: |  |
| Sheet 1 of 19                                                                                                        |  | Description: | No.       | By:                | Date:   | Signature: | Modification: |        |  |
|                                                                                                                      |  | Part No.:    | Design:   | boris              |         |            |               |        |  |
|                                                                                                                      |  | Project:     | Drawn:    |                    |         |            |               |        |  |
|                                                                                                                      |  | Material:    | Check:    |                    |         |            |               |        |  |
|                                                                                                                      |  | Thermal Tre. | Confirm:  | avner pliner       |         |            | Remarks:      |        |  |
|                                                                                                                      |  | Coating:     | Revision: | A                  |         |            |               |        |  |
|                                                                                                                      |  | Finishing:   | General   | Dim.               | Ang.    | Holes.     |               |        |  |
| Scale: 1:1                                                                                                           |  | Qty:         | Tolerance | ± 0.3              | ± 0.5 ° | ± 0.1      |               |        |  |
| All Dim. are MM.                                                                                                     |  | Weight:      | File:     | O:\trump5000-cnc : |         |            |               |        |  |



## DRAWINGS



|                                                                                                                                                         |  |                               |                   |                     |         |            |                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------|-------------------|---------------------|---------|------------|-------------------------------------------------------------------------------------|
| <div>MOLEK LAPIDOT</div> <div>Accessories for Electricity, Communication &amp; Water</div> <div>Metal Sheet Processing &amp; Electronic Packaging</div> |  | Title:                        |                   | DWG NO.             |         | 340003     |                                                                                     |
|                                                                                                                                                         |  | Description:                  | No.               | By:                 | Date:   | Signature: | Modification:                                                                       |
| Part No.:                                                                                                                                               |  | Design:                       | boris             |                     |         |            |                                                                                     |
| Project:                                                                                                                                                |  | Drawn:                        |                   |                     |         |            |                                                                                     |
| Material:                                                                                                                                               |  | strip steel S137-2 galvanized | Check:            |                     |         |            |                                                                                     |
| Thermal Tre.                                                                                                                                            |  |                               | Confirm:          | avner pliner        |         |            | Remarks:                                                                            |
| Coating:                                                                                                                                                |  | IEC 10346, ASTM A653          | Revision:         | A                   |         |            |                                                                                     |
| Finishing:                                                                                                                                              |  |                               | General Tolerance | Dim.                | Ang.    | Holes.     |                                                                                     |
| Qty:                                                                                                                                                    |  |                               |                   | ± 0.3               | ± 0.5 ° | ± 0.1      |  |
| Weight:                                                                                                                                                 |  |                               | File:             | O:\trump15000-cnc : |         |            |                                                                                     |
| Sheet 2 of 19                                                                                                                                           |  |                               |                   |                     |         |            |                                                                                     |
| Scale: 1:1                                                                                                                                              |  | A4                            |                   |                     |         |            |                                                                                     |
| All Dim. are MM.                                                                                                                                        |  |                               |                   |                     |         |            |                                                                                     |



Accessories for Electricity, Communication & Water  
Metal Sheet Processing & Electronic Packaging

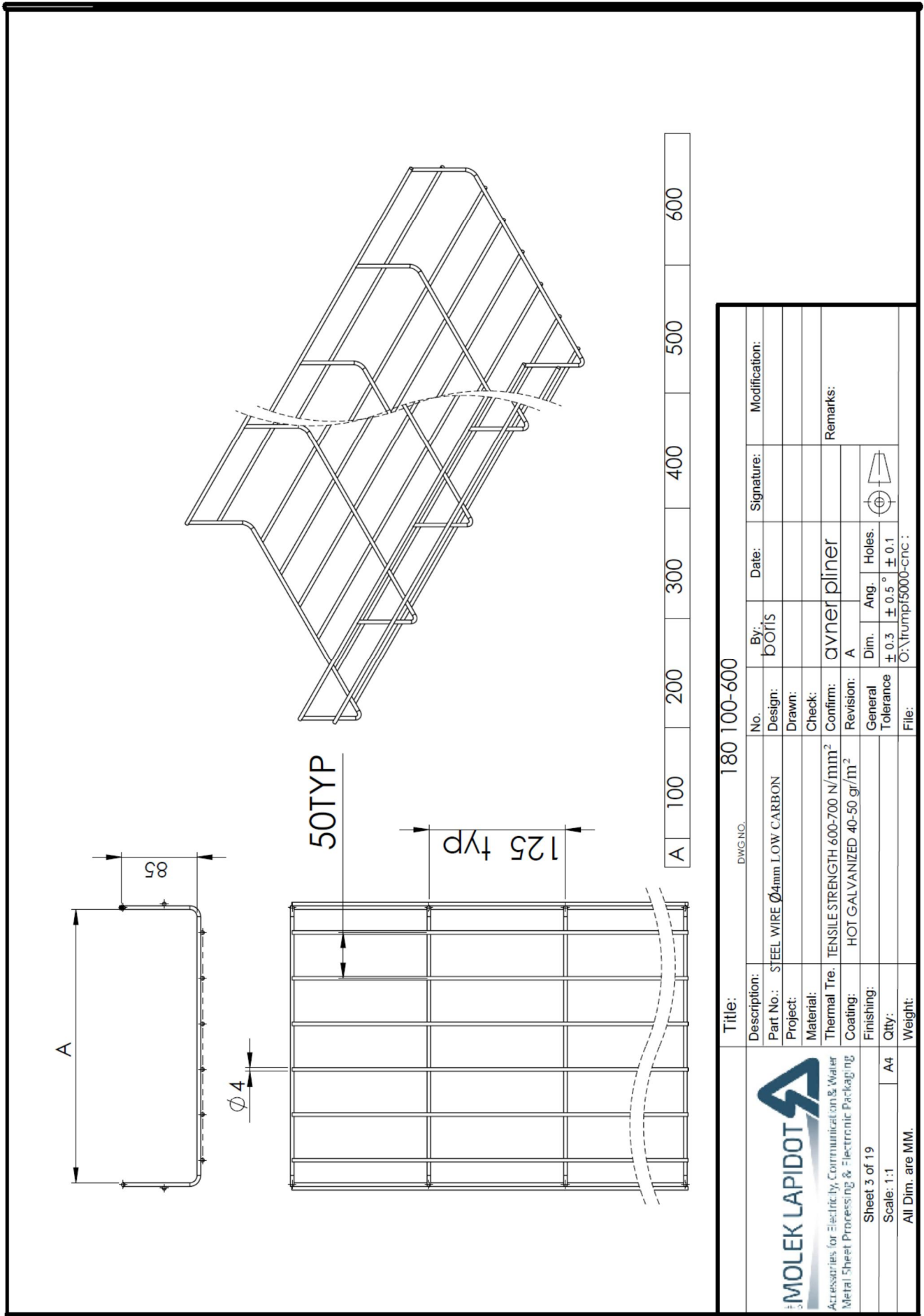
Sheet 2 of 19

Scale: 1:1

All Dim. are MM.

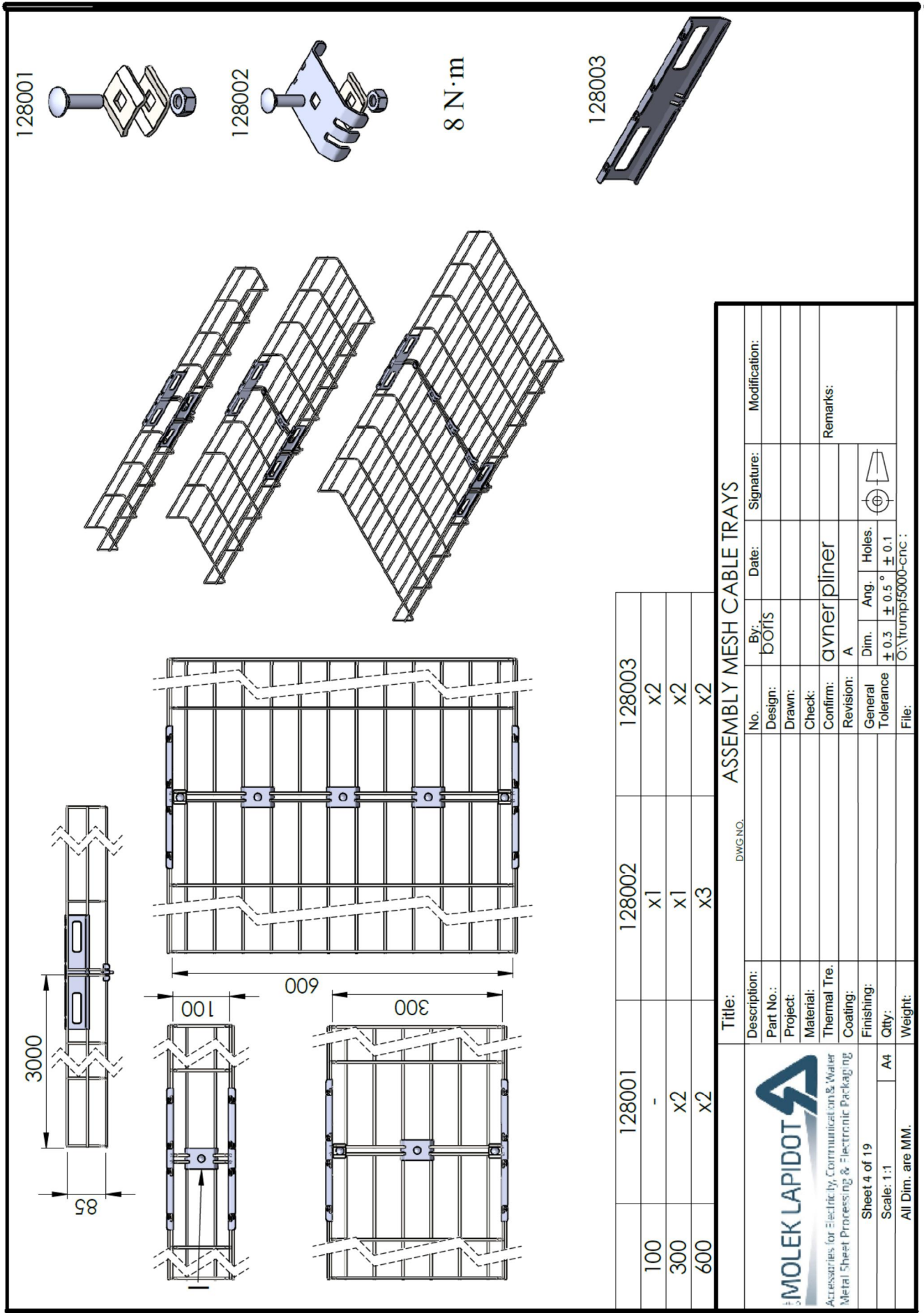


DRAWINGS





DRAWINGS



The drawing shows a metal channel with the following dimensions:

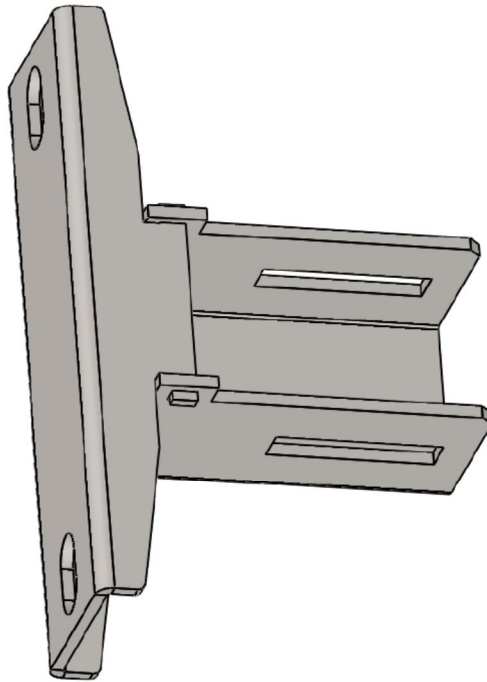
- Overall width: 40
- Inner width: 20
- Height: 12
- Length: L
- Thickness: t

The channel is shown in a perspective view and a side view. The side view shows the channel's profile with a 15mm wide flange and a 20mm wide base. The channel has a series of rectangular holes along its length.

| General Table |     |     |        |
|---------------|-----|-----|--------|
| t             | H   | L   | u"p"n  |
| 1.5           | 60  | 115 | 301100 |
| 1.5           | 80  | 215 | 301200 |
| 1.5           | 120 | 315 | 301300 |
| 2             | 120 | 415 | 301400 |
| 2             | 120 | 515 | 301500 |
| 2             | 120 | 615 | 301600 |



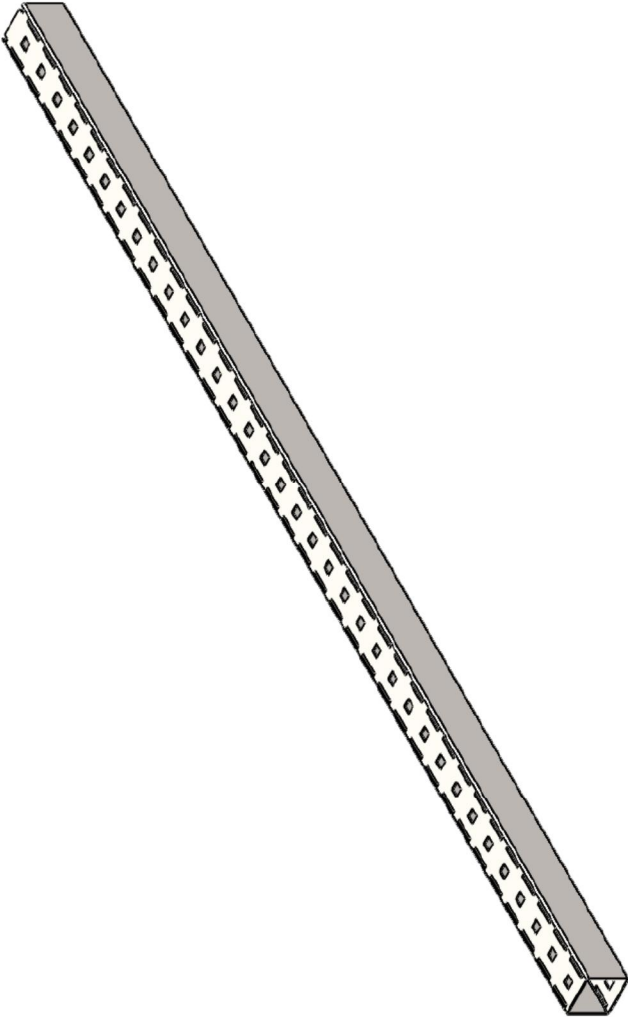
## DRAWINGS



|                                                                                                                                                                                                                         |  |              |                   |                     |         |              |  |                                                                                     |  |            |               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------|-------------------|---------------------|---------|--------------|--|-------------------------------------------------------------------------------------|--|------------|---------------|
| <div><div>Accessories for Electricity, Communication &amp; Water<br/>Metal Sheet Processing &amp; Electronic Packaging</div></div> |  | Title:       |                   | DWG NO.             |         | 301001       |  |                                                                                     |  |            |               |
|                                                                                                                                                                                                                         |  | Description: |                   | No.                 |         | By:          |  | Date:                                                                               |  | Signature: | Modification: |
|                                                                                                                                                                                                                         |  | Part No.:    |                   | Design:             |         | boris        |  |                                                                                     |  |            |               |
|                                                                                                                                                                                                                         |  | Project:     |                   | Drawn:              |         |              |  |                                                                                     |  |            |               |
|                                                                                                                                                                                                                         |  | Material:    |                   | Check:              |         |              |  |                                                                                     |  |            |               |
|                                                                                                                                                                                                                         |  | Thermal Tre. |                   | Confirm:            |         | avner pliner |  |                                                                                     |  |            | Remarks:      |
|                                                                                                                                                                                                                         |  | Coating:     |                   | Revision:           |         | A            |  |                                                                                     |  |            |               |
| Finishing:                                                                                                                                                                                                              |  |              | General Tolerance | Dim.                | Ang.    | Holes.       |  |                                                                                     |  |            |               |
| Qty:                                                                                                                                                                                                                    |  |              |                   | ± 0.3               | ± 0.5 ° | ± 0.1        |  |  |  |            |               |
| Weight:                                                                                                                                                                                                                 |  |              | File:             | O:\trumpf5000-cnc : |         |              |  |                                                                                     |  |            |               |
| Sheet 6 of 19                                                                                                                                                                                                           |  |              |                   |                     |         |              |  |                                                                                     |  |            |               |
| Scale: 1:1                                                                                                                                                                                                              |  |              |                   |                     |         |              |  |                                                                                     |  |            |               |
| All Dim. are MM.                                                                                                                                                                                                        |  |              |                   |                     |         |              |  |                                                                                     |  |            |               |



DRAWINGS



|                               |           |                    |        |            |               |
|-------------------------------|-----------|--------------------|--------|------------|---------------|
| Title:                        |           | DWG NO.            |        | 301010     |               |
| Description:                  | No.       | By:                | Date:  | Signature: | Modification: |
| Part No.:                     | Design:   | boris              |        |            |               |
| Project:                      | Drawn:    |                    |        |            |               |
| Material:                     | Check:    | Remarks:           |        |            |               |
| strip steel S137-2 galvanized |           |                    |        |            |               |
| Thermal Tre.                  | Confirm:  |                    |        |            |               |
| Coating:                      | Revision: |                    |        |            |               |
| IEC 10346, ASTM A653          | A         |                    |        |            |               |
| Finishing:                    | General   | Dim.               | Ang.   | Holes.     |               |
|                               | Tolerance | ± 0.3              | ± 0.5° | ± 0.1      |               |
| Qty:                          | File:     | O:\trump5000-cnc : |        |            |               |
| Weight:                       |           |                    |        |            |               |



Accessories for Electricity Communication & Water  
Metal Sheet Processing & Electronic Packaging

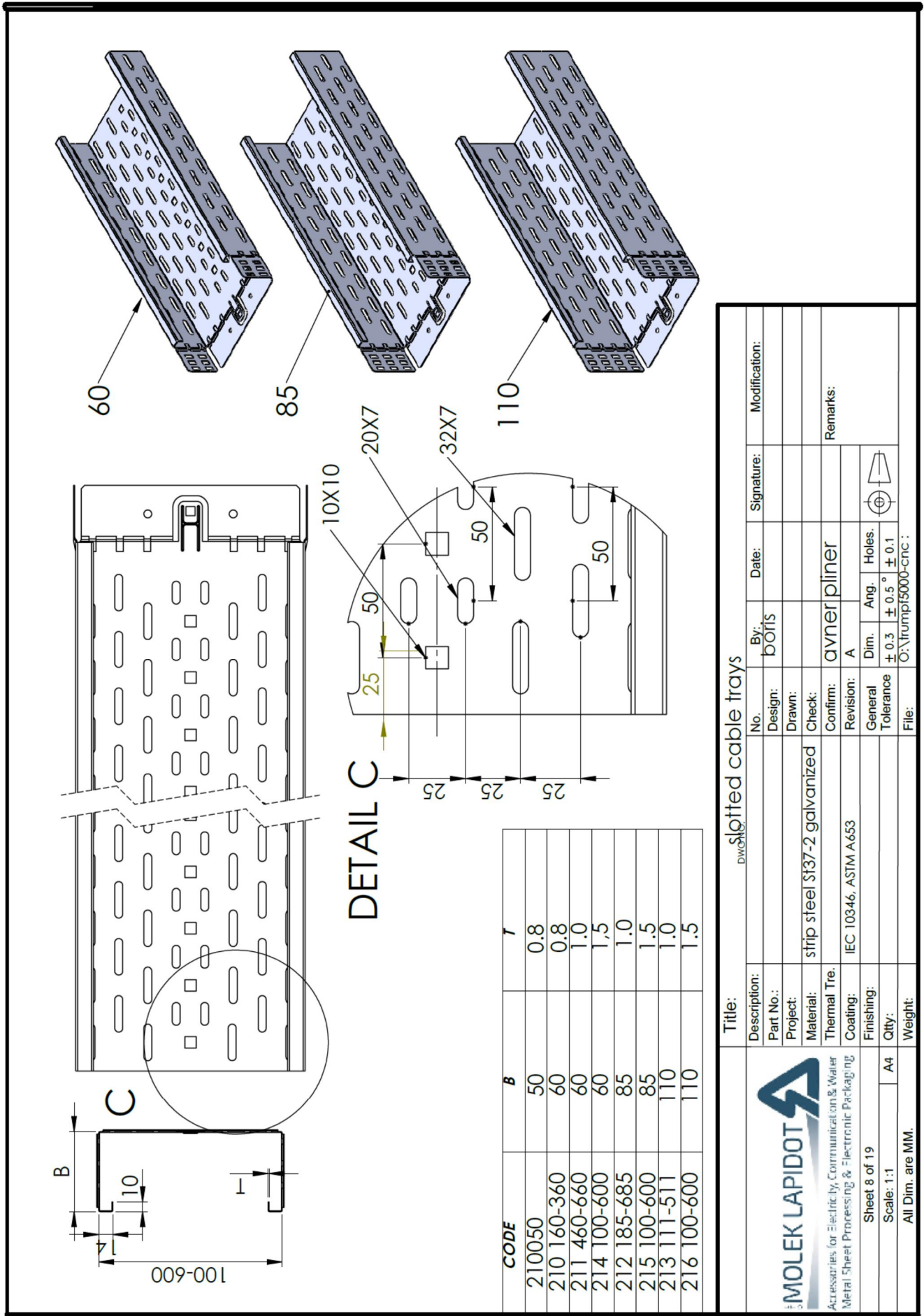
Sheet 7 of 19

Scale: 1:1

All Dim. are MM.



DRAWINGS





DRAWINGS

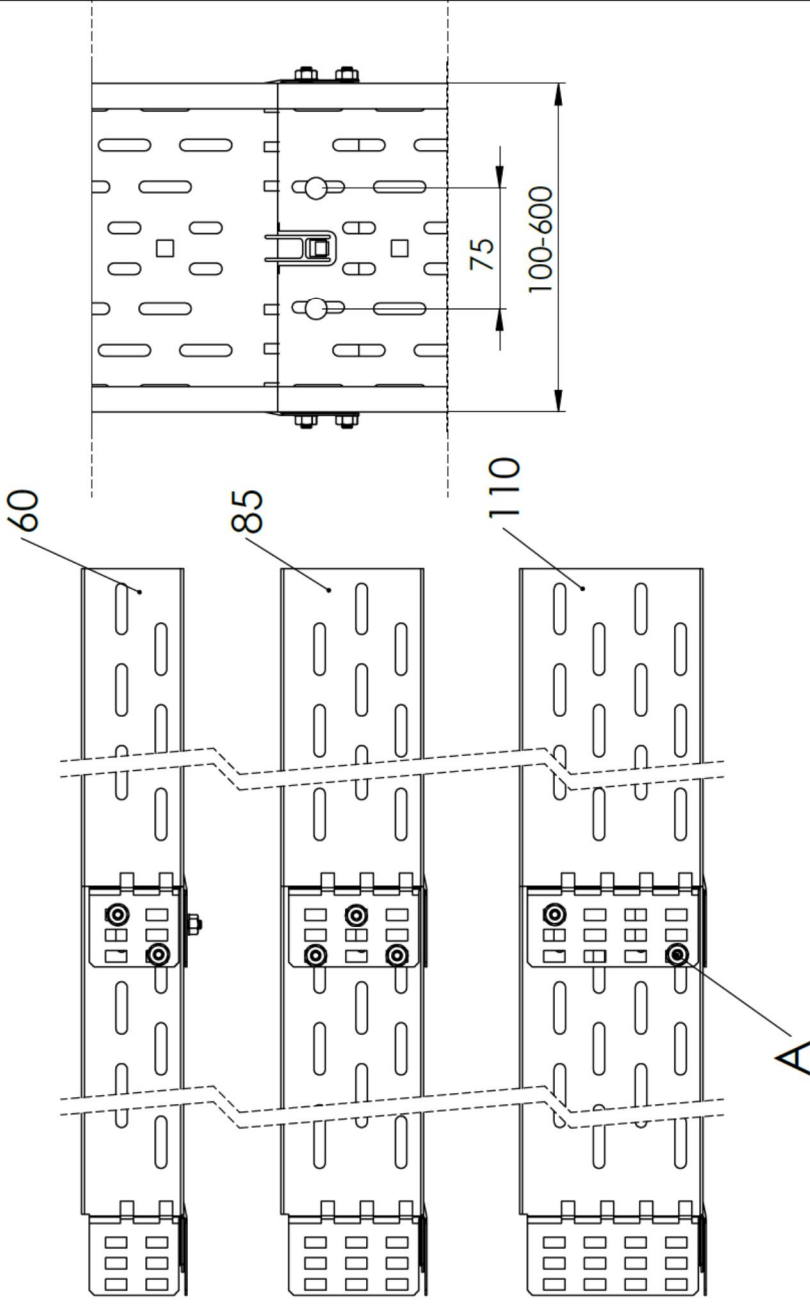
code 230010



M6

8 N·m

|     |
|-----|
| A   |
| 60  |
| 85  |
| 110 |



|              |                   |                              |       |            |               |          |  |
|--------------|-------------------|------------------------------|-------|------------|---------------|----------|--|
| Title:       |                   | assembly slotted cable trays |       |            |               |          |  |
| Description: | No.               | By:                          | Date: | Signature: | Modification: |          |  |
| Part No.:    | Design:           | boris                        |       |            |               |          |  |
| Project:     | Drawn:            |                              |       |            |               |          |  |
| Material:    | Check:            |                              |       |            |               |          |  |
| Thermal Tre. | Confirm:          | avner pliner                 |       |            |               | Remarks: |  |
| Coating:     | Revision:         | A                            |       |            |               |          |  |
| Finishing:   | General Tolerance | Dim.                         | Ang.  | Holes.     |               |          |  |
|              | ± 0.3             | ± 0.5°                       | ± 0.1 |            |               |          |  |
| Qty:         | File:             | O:\trump5000-cnc :           |       |            |               |          |  |
| Weight:      |                   |                              |       |            |               |          |  |



MOLEK LAPIDOT

Accessories for Electricity Communication & Water

Metal Sheet Processing & Electronic Packaging

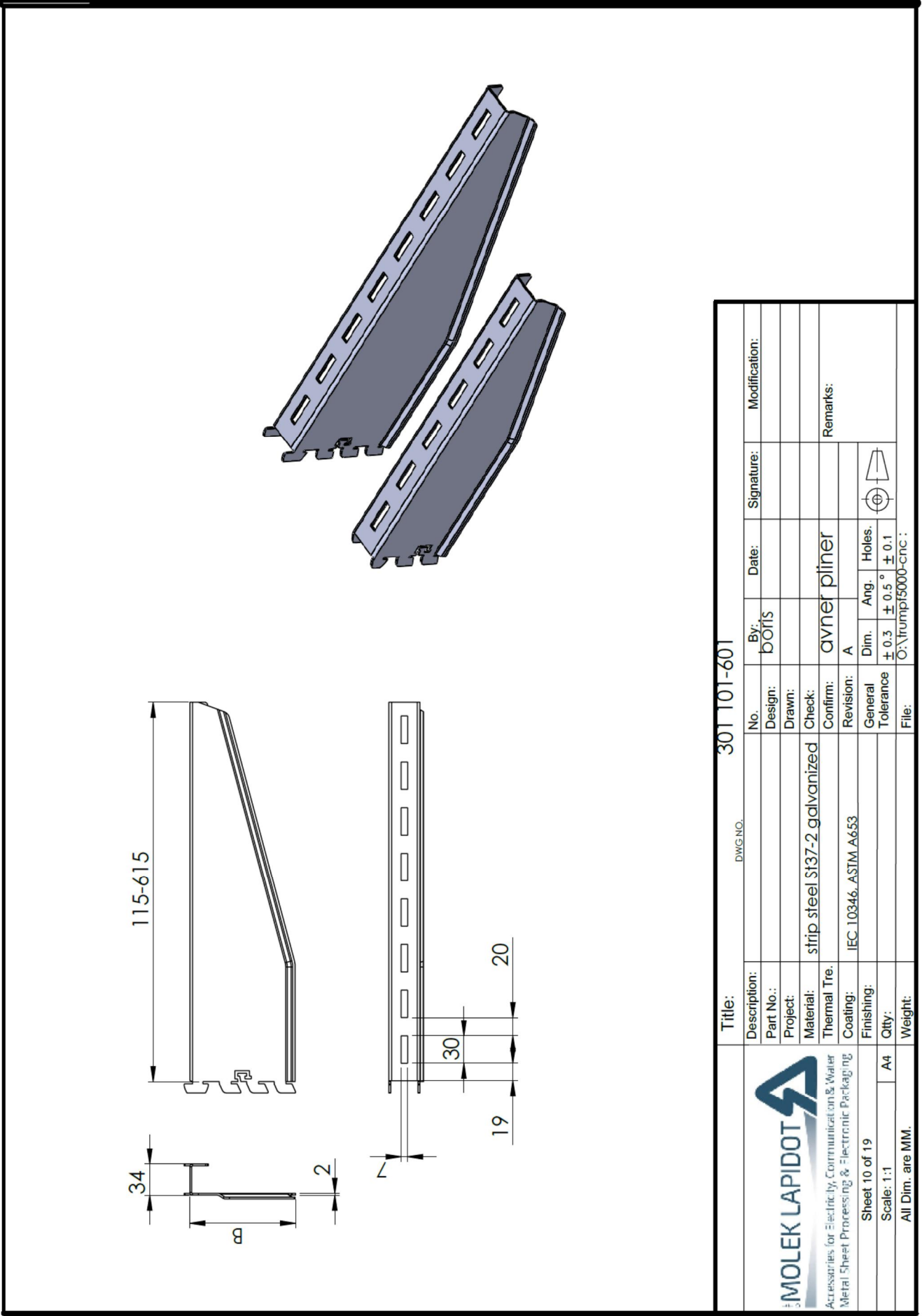
Sheet 9 of 19

Scale: 1:1

All Dim. are MM.

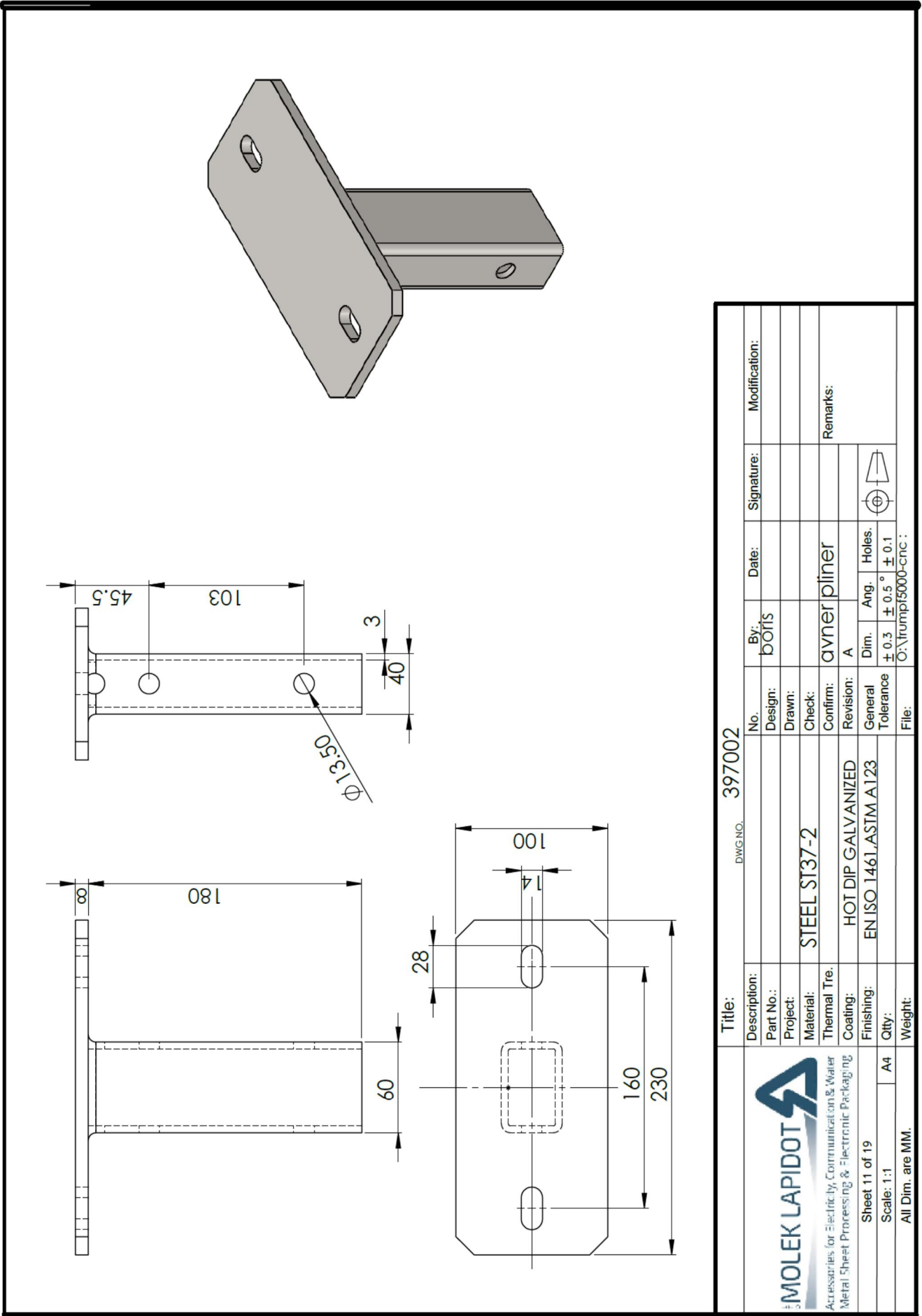


DRAWINGS





DRAWINGS






A

|        |     |
|--------|-----|
| 379004 | 137 |
| 379005 | 184 |



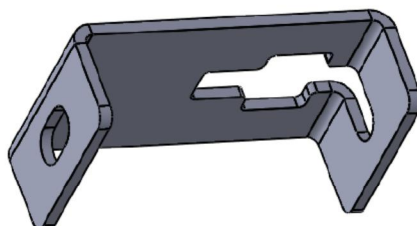
| Title:       |                         | DWG NO.           |                     | 397004 397005 |        |
|--------------|-------------------------|-------------------|---------------------|---------------|--------|
| Description: |                         | No.               |                     | By:           |        |
| Part No.:    |                         | Design:           |                     | Date:         |        |
| Project:     |                         | Drawn:            |                     | Signature:    |        |
| Material:    | strip steel ST37-2      | Check:            |                     |               |        |
| Thermal Tre. |                         | Confirm:          |                     | avner pliner  |        |
| Coating:     | HOT DIP GALVANIZED      | Revision:         | A                   |               |        |
| Finishing:   | EN ISO 1461, ASTM A 123 | General Tolerance | Dim.                | Ang.          | Holes. |
| Qty:         |                         | ± 0.3             | ± 0.5 °             | ± 0.1         |        |
| Weight:      |                         | File:             | O:\trump15000-cnc : |               |        |

|             | A   | B   | C   |
|-------------|-----|-----|-----|
| 397 200-600 | 100 | 100 | 160 |
| 397800      | 100 | 100 | 160 |
| 397999      | 150 | 150 | 210 |

Technical drawing of a metal sheet part, showing a side view with dimensions (70, 4, 55, 3000) and a top view with a break line. The part is a long, narrow strip with a U-shaped cross-section and a series of oval holes along its length.



## DRAWINGS



|                                                                                                                                                                                             |                   |                     |       |            |               |                                                                                     |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------|-------|------------|---------------|-------------------------------------------------------------------------------------|--|
| <br>Accessoires for Electricity Communication & Water<br>Metal Sheet Processing & Electronic Packaging |                   | Title:              |       | DWG NO.    |               | 340001                                                                              |  |
| Description:                                                                                                                                                                                | No.               | By:                 | Date: | Signature: | Modification: | Remarks:                                                                            |  |
| Part No.:                                                                                                                                                                                   | Design:           | boris               |       |            |               |                                                                                     |  |
| Project:                                                                                                                                                                                    | Drawn:            |                     |       |            |               |                                                                                     |  |
| Material:                                                                                                                                                                                   | Check:            |                     |       |            |               |                                                                                     |  |
| Thermal Tre.                                                                                                                                                                                | Confirm:          | avner pliner        |       |            |               |                                                                                     |  |
| Coating:                                                                                                                                                                                    | Revision:         | A                   |       |            |               |  |  |
| Finishing:                                                                                                                                                                                  | General Tolerance | Dim.                | Ang.  | Holes.     |               |                                                                                     |  |
| Qty:                                                                                                                                                                                        | ± 0.3             | ± 0.5°              | ± 0.1 |            |               |                                                                                     |  |
| Weight:                                                                                                                                                                                     | File:             | O:\trump15000-cnc ; |       |            |               |                                                                                     |  |

heavy duty cable ladder

code 360100   code 360600

code 362200   code 362600

code 364070

code 366200

3/8"

code 366200

38 N·m

|              |                         |                               |       |               |               |               |  |
|--------------|-------------------------|-------------------------------|-------|---------------|---------------|---------------|--|
| Title:       |                         | DWG NO.                       |       | 360100-360600 |               | 362200-362600 |  |
| Description: | No.                     | By:                           | Date: | Signature:    | Modification: |               |  |
| Part No.:    | Design:                 | boris                         |       |               |               |               |  |
| Project:     | Drawn:                  |                               |       |               |               |               |  |
| Material:    | Check:                  | strip steel S137-2 galvanized |       |               |               |               |  |
| Thermal Tre. | Confirm:                | avner pliner                  |       |               | Remarks:      |               |  |
| Coating:     | Revision:               | A                             |       |               |               |               |  |
| Finishing:   | General Tolerance       | Dim.                          | Ang.  | Holes.        |               |               |  |
| Qty:         | ± 0.3                   | ± 0.5°                        | ± 0.1 |               |               |               |  |
| Weight:      | File: O:\trump15000-cnc |                               |       |               |               |               |  |

MOLEK LAPIDOT

Accessories for Electricity, Communication & Water

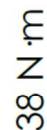
Metal Sheet Processing & Electronic Packaging

Sheet 16 of 19

Scale: 1:1

All Dim. are MM.

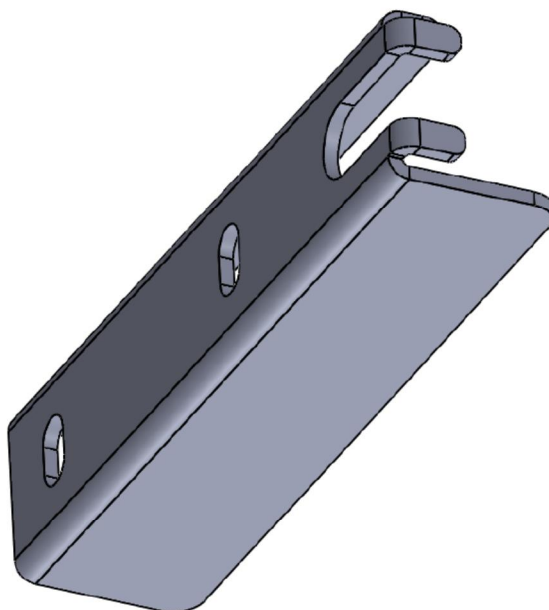
FIRES 064/S-13/10/2017-E



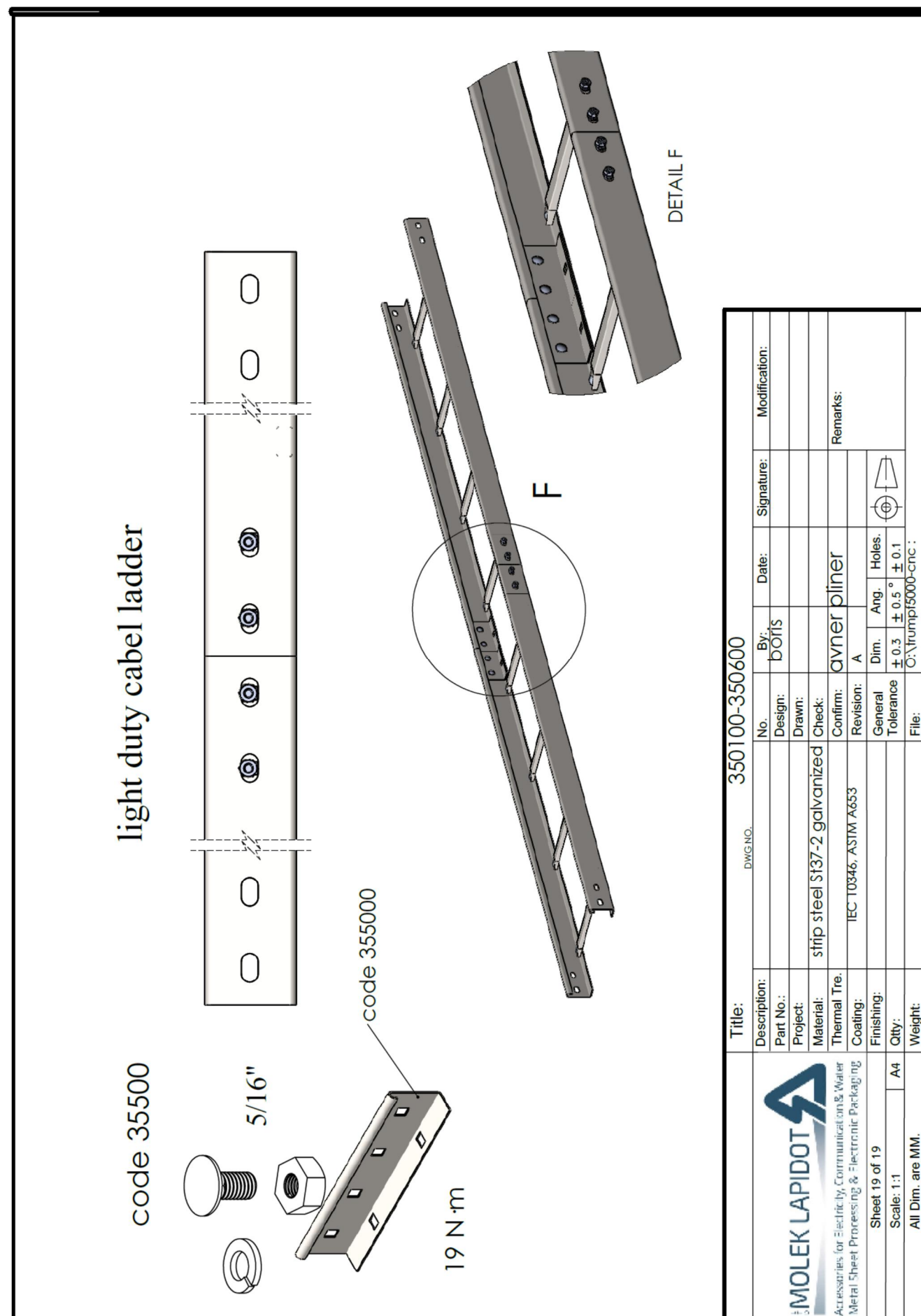
|                                                                                                                                                                                                                                 |                   |              |                     |                            |              |                                                                                       |               |               |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|---------------------|----------------------------|--------------|---------------------------------------------------------------------------------------|---------------|---------------|--|
| <div></div> <div>Accessories for Electricity, Communication &amp; Water</div> <div>Metal Sheet Processing &amp; Electronic Packaging</div> |                   | Title:       |                     | DWG NO.                    |              | 370100-370600                                                                         |               | 372200-372600 |  |
|                                                                                                                                                                                                                                 |                   | Description: | No.                 | By:                        | Date:        | Signature:                                                                            | Modification: |               |  |
|                                                                                                                                                                                                                                 |                   | Part No.:    | Design:             | b0ffs                      |              |                                                                                       |               |               |  |
|                                                                                                                                                                                                                                 |                   | Project:     | Drawn:              |                            |              |                                                                                       |               |               |  |
|                                                                                                                                                                                                                                 |                   | Material:    | Check:              | strip steel St37-2         |              |                                                                                       |               |               |  |
|                                                                                                                                                                                                                                 |                   | Thermal Tre. | Confirm:            | hot dip galvanized         | avner pliner |                                                                                       | Remarks:      |               |  |
|                                                                                                                                                                                                                                 |                   | Coating:     | Revision:           | DIN EN ISO 1461, ASTM A123 | A            |                                                                                       |               |               |  |
| Finishing:                                                                                                                                                                                                                      | General Tolerance |              | Dim.                | Ang.                       | Holes.       |  |               |               |  |
| Qty:                                                                                                                                                                                                                            |                   |              | ± 0.3               | ± 0.5 °                    | ± 0.1        |                                                                                       |               |               |  |
| Scale: 1:1                                                                                                                                                                                                                      | A4                | File:        | C:\trumpf5000-cnc ; |                            |              |                                                                                       |               |               |  |
| All Dim. are MM.                                                                                                                                                                                                                |                   |              |                     |                            |              |                                                                                       |               |               |  |



## DRAWINGS



|                                                                                                                                                                                             |                               |           |                     |                 |            |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------|---------------------|-----------------|------------|---------------|
| <br>Accessoires for Electricity Communication & Water<br>Metal Sheet Processing & Electronic Packaging | Title:                        |           | DWG NO.             |                 | 340002     |               |
|                                                                                                                                                                                             | Description:                  | No.       | By:                 | Date:           | Signature: | Modification: |
| Part No.:                                                                                                                                                                                   |                               |           | boris               |                 |            |               |
| Project:                                                                                                                                                                                    |                               | Drawn:    |                     |                 |            |               |
| Material:                                                                                                                                                                                   | strip steel S137-2 galvanized | Check:    |                     |                 |            |               |
| Thermal Tre.                                                                                                                                                                                |                               | Confirm:  | avner pliner        |                 |            | Remarks:      |
| Coating:                                                                                                                                                                                    | IEC 10346, ASTM A653          | Revision: | A                   |                 |            |               |
| Finishing:                                                                                                                                                                                  |                               | General   | Dim.                | Ang.            | Holes.     |               |
| Qty:                                                                                                                                                                                        | A4                            | Tolerance | $\pm 0.3$           | $\pm 0.5^\circ$ | $\pm 0.1$  |               |
| Weight:                                                                                                                                                                                     | All Dim. are MM.              | File:     | O:\trump15000-cnc : |                 |            |               |





## 8. 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 EN 1363-2. Any significant deviation with respect to size, constructional details, loads, stresses, edge or end conditions other than those allowed under the field of direct application in the relevant test method is not covered by this report.
- § Because of the nature of the fire resistance testing and consequent difficulty in quantifying the uncertainty of measurement of fire resistance, it is not possible to provide a stated degree of accuracy of the result.
- § The test results refer only to the tested subjects. This test report is not an approval of the tested product by the test laboratory or the accreditation body overseeing the laboratory's activities. The test was carried out on testing equipment that is the property of FIRES, s.r.o., Batizovce. Without the written permission of the test laboratory this test report may be copied and/or distributed only as the whole. Any modifications of the test report can be made only by the fire resistance test laboratory FIRES, s.r.o., Batizovce.

Approved by:

Ing. Štefan Rástocký  
leader of the testing laboratory



Prepared by:

Dávid Šubert  
technician of the testing laboratory

## 9. NORMATIVE REFERENCES

|                        |                                                                                                                                                                                             |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EN 1363-1: 2012        | Fire resistance tests. Part 1: General requirements                                                                                                                                         |
| STN 92 0205: 2014      | Fire behaviour of construction products and building constructions. Circuit integrity maintenance of cable systems. Requirements, testing and classification.                               |
| 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                                                                                                            |
| ČSN 73 0895: 2016      | Fire protection of buildings - Circuit integrity maintenance of cable systems under fire conditions - Requirements, testing, classification Px-R, PHx-R and application of the test results |

**THE END OF THE TEST REPORT**