

Document number | TC030_TR_03_0

Product test report


TC030 to IEC 62561-2: 2012



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1 Revision Record

Rev	Description	Prep.	Check'd	App'd	Date
0	Original issue.	A.P.M.	A.P.M.		30/07/2014

2 Introduction

This report details the testing of the Furse component TC030; 25 mm x 3 mm bare copper tape in accordance with IEC 62561-2:2012 Lightning Protection System Components (LPSC) – Part 2: Requirements for conductors and earth electrodes.

2.1 Declaration

The above product supplied by Furse has been successfully tested in accordance with IEC 62561-2:2012 Lightning Protection System Components (LPSC) – Part 2: Requirements for conductors and earth electrodes.

Therefore this component is declared appropriate for use in a lightning protection system (LPS) in line with the scope below.

2.2 Scope of Conformity

For use in a lightning protection system (LPS) for use as an air-termination conductor, down conductor or earth-termination conductor in accordance with Furse literature.

3 Variant Part Numbers

Valid for variant part numbers TC030M, TC031, TC105-FU, TC110, TC115-FU, TC120-FU, TC125-FU, TC130, TC105/50, TC110/50, TC115/50, TC120/50, TC125/50, TC130/50, TC910, TC111-FU.

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**RESEARCH CENTRE FOR TESTS AND DEVELOPMENT
SURGE CURRENT
AND HIGH VOLTAGE LABORATORY**

ELEMKO SA

TEST REPORT No. 31335

**OF 25x3 mm COPPER SOLID TAPE CONDUCTOR
FOR USE IN EXTERNAL LIGHTNING PROTECTION SYSTEMS (LPS)
AS AIR TERMINATION CONDUCTOR, DOWN CONDUCTOR AND EARTH CONDUCTOR**

COMPANY :



PART NUMBER : TC030

**APPLICABLE STANDARD:
IEC / BS EN 62651-2:2012**



<http://www.a2la.org/scopepdf/3051-01.pdf>

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ABBREVIATIONS

IEC : International Electrotechnical Commission
ISO : International Standardization Organization
EN : European Norm
A2LA : American Association for Laboratory Accreditation

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1. (7.1) GENERAL

For the purpose of the easier assimilation of this report by the reader and for the better and the complete presentation of the test data, which is required by the standard IEC / BS EN 62651-2:2012, the format of the headings kept the same as it is mentioned in clause 7 of the above standard.

For the better comparison and completeness of this report with the standard's requirements, the corresponding numbering of the standard is also mentioned in each clause, in brackets.

2 (7.2) REPORT IDENTIFICATION

2.1 (7.2.a) Subject of the report

Description and results presentation of laboratory type testing according to IEC / BS EN 62651-2:2012 on copper solid tape conductor, provided by FURSE (THOMAS & BETTS) with part number TC030.

2.2 (7.2.b) Name, address and telephone number of the test laboratory

Research Development and Testing Centre – High Voltage and High Current Testing laboratory
ELEMKO SA
2nd km Thiva-Chalkida Old National Road, GR 32200, THIVA
Tel: (+30) 2262024523 - 2262024574,
Fax : (+30) 2262023571
e-mail: elemko@elemko.gr

2.3 (7.2.c) Name, address and telephone number of the sub contracting test laboratory

Tensile strength and elongation tests were subcontracted by accredited laboratory (ESYD issue nr. 159-4):

T.C.L Co - Test & Control Laboratories
Head office : 116 Agias Eleousis Str., 151 25 Amarousion, Athens, Greece
Tel: (+30) 2105579375,
Fax : (+30) 2105579376
e-mail: info@ad-ndt.gr

2.4 (7.2.d) Number of test report **31335**

2.5 (7.2.e) Applicant's name and address

Request number: 176
Name: W. J. FURSE Ltd (THOMAS & BETTS)
Address: Wilford Road, Nottingham NG2 1EB,
United Kingdom

2.6 (7.2.f) Total number of pages 12

2.7 (7.1.g) Date of issue of report 2014/04/16

2.8 (7.1.h) Dates of performance the tests

Initiation date: 2014/03/13

Closing date: 2014/04/02

2.9 (7.1.i) Authorized person to sign for the testing laboratory for the content of the report**Dr N. KOKKINOS**

Electrical Engineer Beng, MSc, PhD
Laboratory Technical Manager

2.10 (7.1.j) The tests were conducted by**L. KATSIKOIANNIS**

Electrical Engineer
Test engineer

S. MARKOU

Laboratory Technician

3. (7.3) SPECIMEN DESCRIPTION**3.1 (7.3.a) Specimen description**

Copper conductor, 25x3mm nominal dimensions.

3.2 (7.3.b) Description and identification of the test specimen and /or test assembly

Three specimens of copper conductor 25x3 mm cut to a length of approx. 1200 mm with identification numbers 31335 A, 31335 B & 31335 C.

3.3 (7.3.c) Characterization and condition of the test specimen and/or test assembly

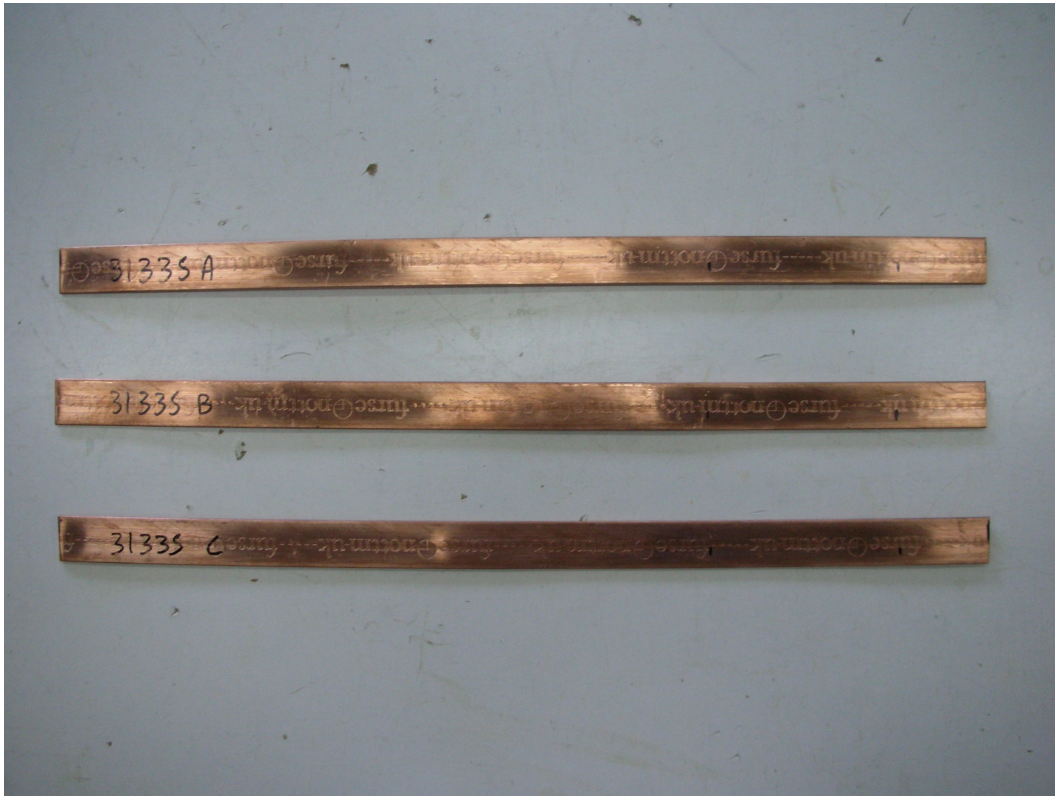
The received conductor were new and in good condition.

3.4 (7.3.d) Sampling procedure

Not relevant.

3.5 (7.3.e) Date of receipt of test items:

2014/03/06

3.6 (7.3.f) Photographs

1. Photograph of first set of specimens before the test sequence



2. Photograph of first set of specimens after the environmental test



3. Photograph of second set of specimens after the tensile test

4. (7.4) CONDUCTOR – ROD – PLATE

4.1 (7.4.a) Material

Copper.

4.2 (7.4.b) Nominal cross-section area, dimensions and shape

Declared by the applicant 75 mm², 25x3 mm solid tape conductor. For actual dimensions see Table of clause 9.

5. (7.5) STANDARDS AND REFERENCES

5.1 (7.5.a) Test standard used

IEC / BS EN 62651-2:2012

“Lightning protection system components (LPSC) – Part 2: Requirements for conductors and earth electrodes”.

5.2 (7.5.b) Other relevant documentation

- IEC EN 62561-1:2012 “Lightning protection system components (LPSC) – Part 1: Requirements for connection components”.
- IEC EN 62305-3 “Protection against lightning – Part 3: Physical damage to structures and life hazards”.
- IEC EN 62305-4 “Protection against lightning – Part 4: Electrical and electronic systems within structures” (IEC 62305-4).
- Furse, Thomas & Betts, Total Sollution Product Catalogue, as downloaded from the website of Thomas & Betts, www.tnb.com in March 2014.

6. (7.6) TEST PROCEDURE

6.1 (7.6.a) Description of test procedure

According to IEC / BS EN 62651-2:2012 the following tests were performed:

- Inspection on installation instructions literature provided by applicant as per clause 4.2 of the standard.
- Material, configuration, minimum dimensions as per clause 4.3 and Table 1, Table 3 of the standard.
- Environmental test as per clause 5.2.4, of the standard.
- Tensile test as per clause 5.2.5 and Table 2, Table 4, of the standard.
- Electrical resistivity test as per clause 5.2.6 and Table 2, Table 4, of the standard.

For each test 3 specimens were used.

Before beginning of tests all specimens were cleaned by using a suitable degreasing agent and each one was marked for identification.

The tests were performed according the standard IEC / BS EN 62651-2:2012. Requirements and results are illustrated in detail in clause 9 “Table of results and parameters recorded” of the present report.

6.2 (7.6.b) Justification for any deviations from, additions to or exclusions from the referenced standard

There were no deviations from, additions to or exclusions from the referenced standard.

6.3 (7.6.c) Other information relevant to the tests

All information is tabled in clause 9 of this report.

6.4 (7.6.d) Configuration of the testing assembly

See photo 1 in clause 3.6 of this report.

6.5 (7.6.e) Location of the arrangement in the testing area and measuring techniques

Environmental – Electrical tests were performed in our laboratory's "conditioning test room".

Mechanical tests (tensile) in subcontractor's test room.

Measuring techniques used are illustrated in detail in clause 9 "Table of results and parameters recorded" of the present report.

7. (7.7) TESTING EQUIPMENT DESCRIPTION

1. Environmental chamber for salt mist ageing and humid sulphurous atmosphere ageing, serial nr. 4077.
2. Elongation and tensile strength machine.



Photograph of environmental ageing chamber used for salt mist and humid sulphurous atmosphere ageing

8. (7.8) MEASURING INSTRUMENTS DESCRIPTION

Instrument	Calibration date	Calibration interval
1. Digital micro-ohmmeter, $5\mu\Omega$ -400 Ω , serial nr. 166423.	2013/05/30	1 year
2. Digital sliding callipers (thickness gauge), 0-150 \pm 0.01mm serial nr. 1U206306.	2013/08/19	1 year
3. Digital balance, 4,200 \pm 0.01gr, serial nr. 077780190.	2013/11/05	1 year
4. 1m rule	2013/09/30 (internal)	1 year
5. Temperature and humidity meter, serial nr. 0004036360	2013/07/18	1 year

9. (7.9) RESULTS AND PARAMETERS RECORDED

The performed tests, required for copper solid tape conductors and their results are shown in the below table :

Table or clause	Requirements and passing criteria for copper solid tape conductors according to IEC/ BS EN 62561-2:2012	Recorded results and parameters	PASS/ FAIL
4.2	<u>Documentation:</u> Adequate information to ensure that the installer can select and install in suitable and safe manner in accordance to EN 62305-3.	<u>Documentation:</u> The information is ensuring that the selection of the tested specimens and its installation can be performed in a suitable and safe manner.	PASS
4.3 Table 1 Table 3	<u>Material:</u> - copper or; - tin plated copper or; - aluminium or; - copper coated aluminium or; - aluminium alloy or; - steel (galvanized or copper coated) or; - stainless steel.	<u>Material:</u> Copper	PASS
4.3 Table 1 Table 3	<u>Configuration:</u> - solid tape or; - stranded or; - solid round.	<u>Configuration:</u> Solid tape	PASS
4.3 Table 1 Table 3	<u>Cross sectional area for copper solid tape conductors:</u> $\geq 50 \text{ mm}^2$ (allowable tolerance -3%)	<u>Cross sectional area:</u> 31335 A : 74,72 mm^2 31335 B : 75,00 mm^2 31335 C : 74,16 mm^2	PASS
4.3 Table 1 Table 3	<u>Recommended thickness for copper solid tape conductors:</u> 2 mm (allowable tolerance -3%)	<u>Thickness:</u> 31335 A : 2,98 mm 31335 B : 2,99 mm 31335 C : 2,97 mm	PASS
5.2.2	<u>Visual inspection of zinc coating:</u>	<u>Visual inspection of coating:</u> NOT APPLICABLE	-


[illegible]

Table or clause	Requirements and passing criteria for copper solid tape conductors according to IEC / BS EN 62561-2:2012	Recorded results and parameters	PASS/FAIL
4.5 5.5	<p><u>Marking test</u></p> <p>The specimens shall be marked with:</p> <ul style="list-style-type: none"> - the manufacturer's or responsible vendor's name, logo or trademark; - identifying symbol. <p>The marking is checked by inspection and by rubbing it by hand for 15 sec, with a piece of cloth soaked in water and again for 15 sec with a piece of cloth soaked with white spirit/mineral spirit.</p> <p>The specimens are deemed to have passed the test if the marking remains legible.</p> <p>Note 1: Where marking proves to be impractical, it may be given on the smallest packing unit.</p> <p>Note 2: Marking made by moulding, pressing or engraving is not subjected to this test.</p>	<p><u>Marking test:</u></p> <p>The marking was made by engraving. Therefore only the visual inspection has been performed.</p> <p>Each specimen was marked with the manufacturer's name and trademark.</p> <p>The product identification is given on the smallest packing unit.</p>	PASS

10. (7.10) SUMMARY STATEMENT

Three specimens of copper solid tape conductor nominal dimensions 25x3 mm, part number TC030, were submitted for testing by FURSE (THOMAS & BETTS) and have been subjected to all the applicable tests required by Standard IEC / BS EN 62651-2:2012, which are mentioned in the clauses 4.2, 4.3, 4.5, 5.2.4, 5.2.5, 5.2.6, 5.5 and Tables 1, 2, 3 & 4 of the standard and found that :

The above three specimens have successfully passed the tests and therefore they satisfy the criteria according to IEC / BS EN 62651-2:2012 for use in external Lightning Protection Systems (LPS) as air termination conductor, down conductor and earth conductor.

	Laboratory Technical Director
NAME	Dr. N. Kokkinos Electrical Engineer BEng, MSc, PhD
SIGNATURE	 ELEMKO S.A. R. & D. Testing Lab. THIVA - GREECE TEL: +30 210 2845400 e-mail: elemko@elemko.gr

NOTE: This report only explains the specimens submitted for test and does not produce evidence for the quality for standard fabrication.

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