

IS 13730 (Part 32) : 1997
IEC 317-32 (1990)

भारतीय मानक

विशेष प्रकार के कुण्डलन तारों के लिए विशिष्टि

भाग 32 काँच-रेशा कुण्डलित, पॉलिस्टर अथवा पॉलिस्टरकृत वार्निश-उपचारित, अनावृत
अथवा इन्मैलित आयताकार ताँबे के तार, तापमान सूचकांक 155

Indian Standard

**SPECIFICATIONS FOR PARTICULAR TYPES OF
WINDING WIRES**

**PART 32 GLASS-FIBRE WOUND, POLYESTER OR POLYESTERIMIDE VARNISH-TREATED,
BARE OR ENAMELLED RECTANGULAR COPPER WIRE, TEMPERATURE INDEX 155**

ICS 29.160.10

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NEW DELHI 110002

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Price Group 2

NATIONAL FOREWORD

This Indian Standard which is identical to IEC 317-32 (1990) 'Specifications for particular types of winding wires — Part 32 : Glass-fibre wound, polyester or polyesterimide varnish-treated, bare or enamelled rectangular copper wire, temperature index 155', issued by the International Electrotechnical Commission was adopted by the Bureau of Indian Standards on the recommendation of the Winding Wires Sectional Committee (ET 33) and approval of the Electrotechnical Division Council.

This Indian Standard specifies the requirements of polyester or polyesterimide varnish-treated, bare or grade 2 enamelled rectangular copper winding wire, temperature index 155.

The series of IEC standards on methods of tests (IEC 851 series) and particular types of windings wires (IEC 317 series) have been adopted without deviation as follows:

IEC 851 series on methods of test for windings wires has already been published as IS 13778/ IEC 851 (series) in six parts.

Adoption of IEC 317 (series) on particular types of windings wires is being carried out in a phased manner under the series IS 13730/IEC 317.

The text of IEC standard has been approved as suitable for publication as Indian Standard without deviation. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- a) Wherever the words 'International Standard' appear, referring to this Standard, they should be read as 'Indian Standard', and
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

Only the English text in the International Standard has been retained while adopting it in this Indian Standard.

CROSS REFERENCES

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with the degree of equivalence :

| <i>International Standard</i> | <i>Corresponding Indian Standard</i> | <i>Degree of Equivalence</i> |
|--|---|------------------------------|
| 317-0-4 (1990) Specifications for particular types of windings wires — Part 0 : General requirements — Section 4 : Glass fibre wound bare or enamelled rectangular copper wire | IS 13730 (Part 0/Sec 4) : 1993 / IEC 317-0-4 (1990) Specifications for particular types of windings wires : Part 0 General requirements, Section 4 Glass-fibre wound bare or enamelled rectangular copper wire | Identical |
| 317-16 (1990) Specifications for particular types of windings wires — Part 16 : Polyester enamelled rectangular copper wire, class 155 | IS 13730 (Part 16) : 1996 / IEC 317-16 (1990) Specifications for particular types of windings wires : Part 16 Polyester enamelled rectangular copper wire, class 155 | Identical |

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Indian Standard

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES

PART 32 GLASS-FIBRE WOUND, POLYESTER OR POLYESTERIMIDE VARNISH-TREATED.
BARE OR ENAMELLED RECTANGULAR COPPER WIRE. TEMPERATURE INDEX 155

1 Scope

This International Standard specifies the requirements of polyester or polyesterimide varnish-treated glass-fibre wound, polyester or polyesterimide varnish-treated, bare or grade 2 enamelled rectangular copper winding wire, temperature index 155.

NOTE - For this type of wire, the heat shock test is inappropriate and therefore a heat shock temperature cannot be established. Consequently, a class based on the requirements for temperature index and heat shock temperature cannot be specified.

The enamelled wire shall be based on one of the following standards and shall be agreed between purchaser and supplier.

IEC 317-16: 1990, *Specifications for particular types of winding wires - Part 16: Polyester enamelled rectangular copper wire, class 155.*

IEC 317-28: 1990, *Specifications for particular types of winding wires - Part 28: Polyester-imide enamelled rectangular copper wire, class 180.*

IEC 317-29: 1990, *Specifications for particular types of winding wires - Part 29: Polyester or polyesterimide overcoated with polyamide-imide enamelled rectangular copper wire, class 200.*

When an enamelled wire is used, it must have a minimum class of 130.

The temperature index of the glass-fibre wound varnish-treated wire is dependent upon the type of varnish used. The varnish applied to the glass-fibre is based upon polyester or polyesterimide resin and shall have a minimum temperature index of 155. The method of test is to be agreed between purchaser and supplier. The maximum service temperature shall be determined by experience.

The glass-fibre covering may be:

- a) a single layer of glass-fibre;
- b) double layer of glass-fibre, with one layer applied in the direction opposite to that of the other layer.

The range of nominal conductor dimensions covered by this standard is:

- width: min. 2,0 mm max. 16,0 mm;
- thickness: min. 0,80 mm max. 5,60 mm.

The specified combinations of width and thickness as well as the specified width/thickness ratio are given in IEC 317-0-4.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid international standards.

IEC 317-0-4: 1990, *Specifications for particular types of winding wires - Part 0: General requirements - Section 4: Glass-fibre wound bare or enamelled rectangular copper wire.*

IEC 317-16: 1990, *Specifications for particular types of winding wires - Part 16: Polyester enamelled rectangular copper wire, class 155.*

IEC 317-28: 1990, *Specifications for particular types of winding wires - Part 28: Polyester-imide enamelled rectangular copper wire, class 180.*

IEC 317-29: 1990, *Specifications for particular types of winding wires - Part 29: Polyester or polyesterimide overcoated with polyamide-imide enamelled rectangular copper wire, class 200.*

3 Definitions and general notes on methods of test

For definitions and general notes on methods of test, see clause 3 of IEC 317-0-4.

In case of inconsistencies between IEC 317-0-4 and this standard, IEC 317-32 shall prevail.

4 Dimensions

See clause 4 of IEC 317-0-4.

5 Electrical resistance

See clause 5 of IEC 317-0-4.

6 Elongation

See clause 6 of IEC 317-0-4.

7 Springiness

See clause 7 of IEC 317-0-4.

8 Flexibility and adherence

See clause 8 of IEC 317-0-4.

9 Heat shock

Test inappropriate.

10 Cut-through

Test inappropriate.

11 Resistance to abrasion

Test inappropriate.

12 Resistance to solvents

Test inappropriate.

13 Breakdown voltage

See clause 13 of IEC 317-0-4.

14 Continuity of insulation

Test inappropriate.

15 Temperature index

See clause 15 of IEC 317-0-4.

16 Resistance to refrigerants

Test inappropriate.

17 Solderability

Test inappropriate.

18 Heat or solvent bonding

Test inappropriate.

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19 Dielectric dissipation factor

Test inappropriate.

20 Resistance to transformer oil

Test inappropriate.

21 Loss of mass

Test inappropriate.

22 High temperature failure

Test inappropriate.

30 Packaging

See clause 30 of IEC 317-0-4.

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| <i>International Standard</i> | <i>Corresponding Indian Standard</i> | <i>Degree of Equivalence</i> |
|--|---|------------------------------|
| 317-28 (1990) Specifications for particular types of windings wires — Part 28 : Polyesterimide enamelled rectangular copper wire, class 180 | IS 13730 (Part 28) : 1996 / IEC 317-28 (1990) Specifications for particular types of windings wires : Part 28 Polyesterimide enamelled rectangular copper wire, class 180 | Identical |
| 317-29 (1990) Specifications for particular types of windings wires — Part 29 : Polyester or polyesterimide overcoated with polyamide-imide enamelled rectangular copper wire, class 200 | IS 13730 (Part 29) : 1996 / IEC 317-29 (1990) Specifications for particular types of windings wires: Part 29 Polyester or polyesterimide overcoated with polyamide-imide enamelled rectangular copper wire, class 200 | Identical |

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

BIS Certification Marking

The product may also be marked with the Standard Mark.

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards : Monthly Additions'.

This Indian Standard has been developed from Doc : No. ET 33 (3778).

Amendments Issued Since Publication

| Amend No. | Date of Issue | Text Affected |
|-----------|---------------|---------------|
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AMENDMENT NO. 1 JUNE 2013
TO
IS 13730 (Part 32) : 1997/IEC 317-32 (1990) SPECIFICATIONS
FOR PARTICULAR TYPES OF WINDING WIRES
PART 32 GLASS-FIBRE WOUND, POLYESTER OR POLYESTERIMIDE
VARNISH-TREATED, BARE OR ENAMELLED RECTANGULAR COPPER WIRE,
TEMPERATURE INDEX 155

(This amendment is based on amendment no 1 published by IEC in the year 1997 and amendment no 2 published by IEC in the year 2005)

Title

Replace the existing title by:

Specifications for particular types of winding wires – Part 32: Glass-fibre wound resin or varnish impregnated, bare or enamelled rectangular copper wire, temperature index 155

Page 1

1 Scope

Replace the first paragraph by the following:

This part of IEC 317 specifies requirements of glass-fibre wound impregnated, bare grade 2 enamelled rectangular copper winding wire, temperature index 155. The impregnating agent can be, for instance, polyester or polyesterimide resin based.

After the second paragraph, delete the year of publication from all referenced standards.

paragraph 7

Replace the existing text by:

The temperature index of the wire is dependent upon the type of impregnating agent used. The impregnating agent applied to the glass fibre should have a minimum temperature index of 155.

After the seventh paragraph, add the following:

The covering shall have four grades of thickness:

- GL1: one glass fibre covering over a bare conductor;
- GL2: two glass fibre coverings over a bare conductor;
- grade 2 GL1: one glass fibre covering (GL1) over grade 2 enamelled conductor (Grade 2)
- grade 2 GL2: two glass fibre coverings (GL2) over grade 2 enamelled conductor (Grade 2)

Page 2

2 Normative references

Delete the year of publication from the following references: IEC 60317-16, IEC 60317-28, IEC 60317-29.

Amendment No. 1 IS 13730 (Part 32) : 1997/IEC 317-32 (1990)

3 Definitions and general notes on methods of test

Replace the title of Clause 3 by the following:

3 Definitions and general notes on methods of test and appearance

Replace the existing text with the following new Subclauses 3.1 and 3.2 as follows:

3.1 General

For definitions and general notes on methods of test, see Clause 3 of IEC 60317-0-4.

In case of inconsistencies between IEC 60317-0-4 and this standard, IEC 60317-32 shall prevail.

3.2 Appearance

See 3.3 of IEC 60317-0-4.

Page 4

Clause 22

Delete clause 22.

Page 4

Add the following new Clause 23:

23 Pin hole test

Test inappropriate.