

IS 13730 (Part 3) : 2012  
IEC 60317-3 : 2004

भारतीय मानक  
विशेष प्रकार की कुंडलण तारों की विशिष्टियाँ  
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( पहला पुनरीक्षण )

*Indian Standard*  
SPECIFICATIONS FOR PARTICULAR TYPES OF  
WINDING WIRES  
PART 3 POLYESTER ENAMELLED ROUND COPPER WIRE, CLASS 155  
( *First Revision* )

ICS 29.060.10

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## NATIONAL FOREWORD

This Indian Standard (Part 3) (First Revision) which is identical with IEC 60317-3 : 2004 'Specifications for particular types of winding wires — Part 3: Polyester enamelled round copper wire, class 155' issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendation of the Winding Wires Sectional Committee and approval of the Electrotechnical Division Council.

This standard was first published in 1996. This revision has been undertaken with a view to bring it in line with the latest version of IEC 60317-3 : 2004.

The text of IEC Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain terminology and 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'.
- 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.

In this adopted standard, reference appear to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard, which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
IEC 60317-0-1 Specifications for particular types of winding wires — Part 0: General requirements — Section 1: Enamelled round copper wire	IS 13730 (Part 0/Sec 1) : 1993 Specifications for particular types of winding wires: Part 0 General requirements, Section 1 Enamelled round copper wire	Identical to IEC 60317-0-1 (1990)

Only the English language text of the International Standard has been retained while adopting it in this Indian Standard, and as such the page numbers given here are not the same as in the IEC Standard.

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 or analysis, 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.

*Indian Standard*  
**SPECIFICATIONS FOR PARTICULAR TYPES OF  
WINDING WIRES**

**PART 3 POLYESTER ENAMELLED ROUND COPPER WIRE, CLASS 155**  
*( First Revision )*

## **1 Scope**

This part of IEC 60317 specifies the requirements of enamelled round copper winding wire of class 155 with a sole coating based on polyester resin, which may be modified provided it retains the chemical identity of the original resin and meets all specified wire requirements.

NOTE A modified resin is a resin that has undergone a chemical change, or contains one or more additives to enhance certain performance or application characteristics.

Class 155 is a thermal class that requires a minimum temperature index of 155 and a heat shock temperature of at least 175 °C.

The temperature in degrees Celsius corresponding to the temperature index is not necessarily that at which it is recommended that the wire be operated and this will depend on many factors, including the type of equipment involved.

The range of nominal conductor diameters covered by this standard is as follows:

- grade 1: 0,020 mm up to and including 3,150 mm;
- grade 2: 0,020 mm up to and including 5,000 mm.

The nominal conductor diameters are specified in Clause 4 of IEC 60317-0-1.

## **2 Normative references**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60317-0-1, *Specifications for particular types of winding wires – Part 0: General requirements – Section 1: Enamelled round copper wire*

## **3 Definitions and general notes on methods of test and appearance**

### **3.1 Definitions and general notes on methods of test**

For definitions and general notes on methods of test, see Clause 3 of IEC 60317-0-1.

In case of inconsistencies between IEC 60317-0-1 and this standard, IEC 60317-3 shall prevail.

### **3.2 Appearance**

See Clause 3 of IEC 60317-0-1.

### **4 Dimensions**

See Clause 4 of IEC 60317-0-1.

### **5 Electrical resistance**

See Clause 5 of IEC 60317-0-1.

### **6 Elongation**

See Clause 6 of IEC 60317-0-1.

### **7 Springiness**

See Clause 7 of IEC 60317-0-1.

### **8 Flexibility and adherence**

See Clause 8 of IEC 60317-0-1, where the constant  $K$  used for the calculation of the number of revolutions for the peel test shall be 150 mm.

### **9 Heat shock**

See Clause 9 of IEC 60317-0-1, where the minimum heat shock temperature shall be 175 °C.

### **10 Cut-through**

No failure shall occur within 2 min at a temperature of 270 °C.

### **11 Resistance to abrasion**

(nominal conductor diameters from 0,250 mm up to and including 2,500 mm)

The wire shall meet the requirements given in Table 1.

**Table 1 – Resistance to abrasion**

Nominal conductor diameter	Grade 1		Grade 2	
	Minimum average force to failure	Minimum force to failure of each measurement	Minimum average force to failure	Minimum force to failure of each measurement
mm	N	N	N	N
0,250	2,70	2,30	4,50	3,80
0,280	2,90	2,45	4,80	4,10
0,315	3,15	2,65	5,20	4,40
0,355	3,40	2,85	5,60	4,75
0,400	3,65	3,05	6,00	5,10
0,450	3,90	3,30	6,45	5,45
0,500	4,20	3,55	6,90	5,85
0,560	4,50	3,80	7,40	6,25
0,630	4,85	4,10	7,90	6,70
0,710	5,20	4,40	8,50	7,20
0,800	5,60	4,70	9,10	7,70
0,900	6,05	5,10	9,70	8,20
1,000	6,55	5,50	10,40	8,80
1,120	7,05	5,95	11,10	9,40
1,250	7,60	6,45	11,90	10,00
1,400	8,20	6,95	12,70	10,80
1,600	8,90	7,55	13,70	11,60
1,800	9,60	8,15	14,70	12,40
2,000	10,30	8,75	15,70	13,30
2,240	11,10	9,40	16,70	14,20
2,500	11,90	10,10	17,80	15,10

For intermediate nominal conductor diameters, the value of the next larger nominal conductor diameter shall be taken.

## 12 Resistance to solvents

See Clause 12 of IEC 60317-0-1.

## 13 Breakdown voltage

See Clause 13 of IEC 60317-0-1, where the elevated temperature shall be 155 °C.

## 14 Continuity of insulation

See Clause 14 of IEC 60317-0-1.

## 15 Temperature index

See Clause 15 of IEC 60317-0-1, where the minimum temperature index shall be 155.

**16 Resistance to refrigerants**

Test inappropriate.

**17 Solderability**

Test inappropriate.

**18 Heat or solvent bonding**

Test inappropriate.

**19 Dielectric dissipation factor**

Test inappropriate.

**20 Resistance to transformer oil**

Test inappropriate.

**23 Pin hole test**

Requirements under consideration.

**30 Packaging**

See Clause 30 of IEC 60317-0-1.

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard alongwith 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 Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: ETD 33 (6216).

### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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