IEC 60317-8

Edition 4.0 2010-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Specifications for particular types of winding wires –
Part 8: Polyesterimide enamelled round copper wire, class 180

Spécifications pour types particuliers de fils de bobinage –
Partie 8: Fil de section circulaire en cuivre émaillé avec polyesterimide, classe 180

IEC 60317-8:2010

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FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60317-8 has been prepared by IEC technical committee 55: Winding wires.

This fourth edition of IEC 60317-8 cancels and replaces the third edition published in 1990, its amendment 1 (1997) and its Amendment 2 (1997). This edition constitutes a technical revision.

The main changes with respect to the previous edition are as follows:

– introduction of requirements for appearance;
– new reference to resistance to refrigerants test method;
– deletion of high temperature failure requirements;
– introduction of pin hole test requirements.

The text of this standard is based on the following documents:

FDIS	Report on voting
55/1177/FDIS	55/1188/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This International Standard is to be read in conjunction with IEC 60317-0-1 (2008).

A list of all the parts in the IEC 60317 series, under the general title *Specifications for particular types of winding wires*, can be found on the IEC website.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

This Part of IEC 60317 is one of a series which deals with insulated wires used for windings in electrical equipment. The series has three groups describing

1) winding wires and methods of test (IEC 60851) ;
2) specifications for particular types of winding wires (IEC 60317);
3) packaging of winding wires (IEC 60264).

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 8: Polyesterimide enamelled round copper wire, class 180

1 Scope

This Part of IEC 60317 specifies the requirements of enamelled round copper winding wires of class 180 with a sole coating based on polyesterimide 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 180 is a thermal class that requires a minimum temperature index of 180 and a heat shock temperature of at least 200 °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: 0,018 mm up to and including 3,150 mm;
– Grade 2: 0,020 mm up to and including 5,000 mm;
– Grade 3: 0,250 mm up to and including 1,600 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 60317-0-1:2008, *Specifications for particular types of winding wires – Part 0-1: General requirements – Enamelled round copper wire*

IEC 60851-4:1996, *Methods of test for winding wires – Part 4: Chemical properties*
Amendment 1 (1997)
Amendment 2 (2005)

3 Terms, definitions and general notes on methods of test and appearance

3.1 Terms and definitions

For terms and definitions see 3.1 of IEC 60317-0-1. In case of inconsistencies between IEC 60317-0-1 and this standard, IEC 60317-8 shall prevail.

3.2 General notes on methods of test

For general notes on methods of test, see 3.2 of IEC 60317-0-1. In case of inconsistencies between IEC 60317-0-1 and this standard, IEC 60317-8 shall prevail.

3.3 Appearance

See 3.3 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 110 mm.

9 Heat shock

See Clause 9 of IEC 60317-0-1, where the minimum heat shock temperature shall be 200 °C.

10 Cut-through

No failure shall occur within 2 min at 300 °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		Grade 3	
	Minimum average force to failure	Minimum force to failure of each measure-ment	Minimum average force to failure	Minimum force to failure of each measure-ment	Minimum average force to failure	Minimum force to failure of each measure-ment
mm	N	N	N	N	N	N
0,250	2,85	2,45	4,70	4,00	5,80	4,90
0,280	3,10	2,60	5,05	4,30	6,25	5,30
0,315	3,35	2,80	5,45	4,60	6,70	5,70
0,355	3,60	3,05	5,85	4,95	7,20	6,10
0,400	3,85	3,25	6,25	5,30	7,70	6,50
0,450	4,15	3,50	6,75	5,70	8,25	7,00
0,500	4,45	3,75	7,20	6,10	8,85	7,50
0,560	4,75	4,05	7,70	6,50	9,50	8,05
0,630	5,10	4,35	8,25	7,00	10,2	8,65
0,710	5,45	4,65	8,85	7,50	10,9	9,25
0,800	5,85	4,95	9,50	8,05	11,7	9,90
0,900	6,30	5,35	10,2	8,60	12,5	10,6
1,000	6,75	5,75	10,9	9,20	13,3	11,3
1,120	7,35	6,20	11,6	9,80	14,2	12,0
1,250	7,90	6,70	12,5	10,5	15,2	12,9
1,400	8,50	7,20	13,3	11,3	16,4	13,9
1,600	9,20	7,80	14,3	12,1	17,6	14,9
1,800	9,95	8,40	15,4	13,0	–	–
2,000	10,6	9,00	16,4	13,9	–	–
2,240	11,7	9,90	17,5	14,8	–	–
2,500	12,8	10,8	18,6	15,8	–	–
For intermediate nominal conductor diameters, the value of the next largest nominal conductor diameter shall be taken.						

12 Resistance to solvents

See Clause 12 of IEC 60317-0-1, however, the change shall not be a reduction of more than three grades of pencil hardness.

13 Breakdown voltage

See Clause 13 of IEC 60317-0-1, where the elevated temperature shall be 180 °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 180.

16 Resistance to refrigerants

When tested according to IEC 60851-4, Clause 4, the percentage of extractable matter shall not exceed 0,5 %. The requirement for breakdown voltage shall be 75 % of the minimum specified value.

17 Solderability

Test inappropriate.

18 Heat or solvent bonding

Test inappropriate.

19 Dielectric dissipation factor

Test inappropriate.

20 Resistance to transformer oil

Test appropriate but no requirements specified.

21 Loss of mass

Test inappropriate.

23 Pin hole test

See Clause 23 of IEC 60317-0-1.

30 Packaging

See Clause 30 of IEC 60317-0-1.

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