BS EN 60317-59:2016

BSI Standards Publication

Specifications for particular types of winding wires

Part 59: Polyamide-imide enamelled round copper wire, class 240

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National foreword

This British Standard is the UK implementation of EN 60317-59:2016. It is identical to IEC 60317-59:2015.

The UK participation in its preparation was entrusted to Technical Committee L/-/99, Miscellaneous Standards - Electrical.

A list of organizations represented on this committee can be obtained on request to its secretary.

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EUROPEAN STANDARD

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EN 60317-59

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English Version

Specifications for particular type of winding wires - Part 59: Polyamideimide enameled round copper wire, class 240 (IEC 60317-59:2015)

Spécifications pour types particuliers de fils de bobinage - Partie 59: Fil de section circulaire en cuivre émaillé avec polyamide-imide, classe 240 (IEC 60317-59:2015)

Technische Lieferbedingungen für bestimmte Typen von Wickeldrähten - Teil 59: Runddrähte aus Kupfer, lackisoliert mit Polyamidimid, Klasse 240 (IEC 60317-59:2015)

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European foreword

The text of document 55/1502/CDV, future edition 1 of IEC 60317-59, prepared by IEC/TC 55 "Winding wires" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60317-59:2016.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2016-09-09
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2018-12-09

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The text of the International Standard IEC 60317-59:2015 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60264 (series)	NOTE	Harmonized in EN 60264 (series).
IEC 60317 (series)	NOTE	Harmonized in EN 60317 (series).
IEC 60851 (series)	NOTE	Harmonized in EN 60851 (series).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60317-0-1	2013	Specifications for particular types of winding wires -- Part 0-1: General requirements - Enamelled round copper wire	EN 60317-0-1	2014

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 59: Polyamide-imide enamelled round copper wire, class 240

FOREWORD

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International Standard IEC 60317-59 has been prepared by IEC technical committee 55: Winding wires.

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

CDV	Report on voting
55/1502/CDV	55/1529/RVC

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 60317-0-1:2013.

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

The numbering of clauses in this standard is not continuous between Clauses 20 and 30 in order to reserve space for possible future wire requirements prior to those for wire packaging.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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 – Test methods (IEC 60851 series);
2) Specifications for particular types of winding wires (IEC 60317 series);
3) Packaging of winding wires (IEC 60264 series).

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 59: Polyamide-imide enamelled round copper wire, class 240

1 Scope

This part of IEC 60317 specifies the requirements of enamelled round copper winding wire of class 240 with a single coating of polyamide-imide resin.

The range of nominal conductor diameters covered by this part of IEC 60317 is:

– grade 1: 0,180 mm up to and including 1,600 mm;
– grade 2: 0,180 mm up to and including 1,600 mm.

The nominal conductor diameters are specified in Clause 4 of IEC 60317-0-1:2013.

2 Normative references

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

IEC 60317-0-1:2013, *Specifications for particular types of winding wires – Part 0-1: General requirements – Enamelled round copper wire*

3 Terms, definitions, general notes and appearence

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60317-0-1:2013 apply.

3.2 General notes

3.2.1 Methods of test

Subclause 3.2.1 of IEC 60317-0-1:2013 applies. In case of inconsistencies between IEC 60317-0-1 and this part of IEC 60317, the latter shall prevail.

3.2.2 Winding wire

Class 240 is a thermal class that requires a minimum temperature index of 240 and a heat shock temperature of at least 260 °C.

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

3.3 Appearance

Subclause 3.3 of IEC 60317-0-1:2013 applies.

4 Dimensions

Clause 4 of IEC 60317-0-1:2013 applies.

5 Electrical resistance

Clause 5 of IEC 60317-0-1:2013 applies.

6 Elongation

Clause 6 of IEC 60317-0-1:2013 applies.

7 Springiness

Clause 7 of IEC 60317-0-1:2013 applies.

8 Flexibility and adherence

Clause 8 of IEC 60317-0-1:2013 applies. For 8.4, Peel test, the constant *K* used for the calculation of the number of revolutions shall be 75 mm.

9 Heat shock

Clause 9 of IEC 60317-0-1:2013 applies. The minimum heat shock temperature shall be 260 °C.

10 Cut-through

No failure shall occur within 2 min at 450 °C.

11 Resistance to abrasion

For nominal conductor diameters from 0,250 mm up to and including 1,600 mm, the wire shall meet the requirements given in Table 1.

For intermediate nominal conductor diameters, the value of the next larger nominal conductor diameter applies.

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	3,00	2,55	4,90	4,15
0,280	3,25	2,75	5,25	4,45
0,315	3,50	2,95	5,65	4,80
0,355	3,75	3,20	6,05	5,15
0,400	4,05	3,45	6,50	5,50
0,450	4,35	3,70	7,00	5,90
0,500	4,65	3,95	7,50	6,35
0,560	5,00	4,25	8,00	6,80
0,630	5,35	4,55	8,60	7,30
0,710	5,70	4,85	9,20	7,80
0,800	6,10	5,15	9,90	8,40
0,900	6,55	5,55	10,60	9,00
1,000	7,05	5,95	11,30	9,60
1,120	7,60	6,45	12,10	10,20
1,250	8,20	6,95	12,90	11,00
1,400	8,80	7,45	13,90	11,80
1,600	9,45	8,00	14,90	12,60

12 Resistance to solvents

Clause 12 of IEC 60317-0-1:2013 applies.

13 Breakdown voltage

Clause 13 of IEC 60317-0-1:2013 applies. The elevated temperature shall be 240 °C.

14 Continuity of insulation

Clause 14 of IEC 60317-0-1:2013 applies.

15 Temperature index

Clause 15 of IEC 60317-0-1:2013 applies. The minimum temperature index shall be 240.

16 Resistance to refrigerants

Test appropriate, but no requirements specified.

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 appropriate, but no requirements specified.

23 Pin hole test

Clause 23 of IEC 60317-0-1:2013 applies.

30 Packaging

Clause 30 of IEC 60317-0-1:2013 applies.

Bibliography

IEC 60264 (all parts), *Packaging of winding wires*

IEC 60317 (all parts), *Specifications for particular types of winding wires*

IEC 60851 (all parts), *Winding wires – Test methods*

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