

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Specifications for particular types of winding wires –
Part 89: Polyesterimide enamelled round aluminum wire, class 200**

**Spécifications pour types particuliers de fils de bobinage –
Partie 89: Fil de section circulaire en aluminium émaillé au polyestérimide,
classe 200**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –**Part 89: Polyesterimide enamelled round aluminium wire, class 200**

FOREWORD

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IEC 60317-89 has been prepared by IEC technical committee 55: Winding wires. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
55/1939/CDV	55/1972/RVC

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

The language used for the development of this International Standard is English.

This International Standard is to be used in conjunction with IEC 60317-0-3:2008, its Amendment 1 (2013) and its Amendment 2 (2019).

The numbering of clauses in this standard is not continuous from Clauses 21 through 30 in order to reserve space for possible future wire requirements prior to those for wire packaging.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all 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 committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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- withdrawn,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

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INTRODUCTION

This part of IEC 60317 belongs to a series of standards which deals with insulated wires used for windings in electrical equipment. It is composed of the following series:

- 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).

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SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 89: Polyesterimide enamelled round aluminium wire, class 200

1 Scope

This part of IEC 60317 specifies the requirements of enamelled round aluminium winding wire of class 200 with a sole coating based on polyesterimide resin, which can be modified providing 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.

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

- grade 1: 0,250 mm up to and including 1,600 mm;
- grade 2: 0,250 mm up to and including 5,000 mm.

The nominal conductor diameters are specified in Clause 4 of IEC 60317-0-3:2008 and IEC 60317-0-3:2008/AMD1:2013.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60317-0-3¹:2008, *Specifications for particular types of winding wires – Part 0-3: General requirements – Enamelled round aluminium wire*

IEC 60317-0-3:2008/AMD1:2013

IEC 60317-0-3:2008/AMD2:2019

IEC 60851-4:2016, *Winding wires – Test methods – Part 4: Chemical properties*

3 Terms, definitions, general notes and appearance

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60317-0-3 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

¹ A consolidated version of this document exists, including IEC 60317-0-3:2008, its Amendment 1 (2013) and its Amendment 2 (2019).

3.2 General notes

3.2.1 Methods of test

Subclause 3.2.1 of IEC 60317-0-3:2008/AMD1:2013 and IEC 60317-0-3:2008/AMD2:2019 applies. In case of inconsistencies between IEC 60317-0-3 and this document, the latter shall prevail.

3.2.2 Winding wire

Class 200 is a thermal class that requires a minimum temperature index of 200 and a heat shock temperature of at least 220 °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.

3.3 Appearance

Subclause 3.3 of IEC 60317-0-3:2008 applies.

4 Dimensions

Clause 4 of IEC 60317-0-3:2008 and IEC 60317-0-3:2008/AMD1:2013 applies.

5 Electrical resistance (standards.iteh.ai)

Clause 5 of IEC 60317-0-3:2008 and IEC 60317-0-3:2008/AMD2:2019 applies.

6 Elongation

Clause 6 of IEC 60317-0-3:2008 applies.

7 Springiness

Test inappropriate.

8 Flexibility and adherence

Clause 8 of IEC 60317-0-3:2008 applies.

9 Heat shock

Clause 9 of IEC 60317-0-3:2008 applies, where the minimum heat shock temperature shall be 220 °C.

10 Cut-through

Test inappropriate.

11 Resistance to abrasion

(nominal conductor diameters 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
	N	N	N	N
0,250	1,30	1,10	2,45	2,10
0,280	1,45	1,20	2,60	2,25
0,315	1,60	1,30	2,80	2,40
0,355	1,75	1,50	3,00	2,55
0,400	1,95	1,65	3,15	2,65
0,450	2,10	1,75	3,40	2,85
0,500	2,25	1,90	3,60	3,05
0,560	2,40	2,05	3,85	3,25
0,630	2,55	2,20	4,15	3,50
0,710	2,75	2,35	4,45	3,75
0,800	2,95	2,50	4,75	4,05
0,900	3,15	2,70	5,10	4,30
1,000	3,40	2,90	5,45	4,60
1,120	3,70	3,10	5,80	4,90
1,250	3,95	3,35	6,25	5,25
1,400	4,25	3,60	6,65	5,45
1,600	4,60	3,90	7,15	5,85
1,800	-	-	7,70	6,50
2,000	-	-	8,20	6,95
2,240	-	-	8,75	7,40
2,500	-	-	9,30	7,90

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

12 Resistance to solvents

Clause 12 of IEC 60317-0-3:2008 applies.

13 Breakdown voltage

Clause 13 of IEC 60317-0-3:2008 and IEC 60317-0-3:2008/AMD1:2013 applies, where the elevated temperature shall be 200 °C.

14 Continuity of insulation

Clause 14 of IEC 60317-0-3:2008 applies.

15 Temperature index

Clause 15 of IEC 60317-0-3:2008 applies, where the minimum temperature index shall be 200.

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 hydrolysis and to transformer oil

Test according to Clause 6 of IEC 60851-4:2016 appropriate. Test requirements under consideration.

21 Loss of mass

Test inappropriate.

23 Pin hole test

Clause 23 of IEC 60317-0-3:2008 applies.

30 Packaging

Clause 30 of IEC 60317-0-3:2008 applies.