

INTERNATIONAL STANDARD



Specifications for particular types of winding wires –
Part 71: Polyester glass-fibre wound **fused** and resin or varnish impregnated,
bare or enamelled round copper wire, temperature index 180

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INTERNATIONAL STANDARD



Specifications for particular types of winding wires –
Part 71: Polyester glass-fibre wound **fused** and resin or varnish impregnated,
bare or enamelled round copper wire, temperature index 180

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 71: Polyester glass-fibre wound ~~fused~~ and resin or varnish impregnated, bare or enamelled round copper wire, temperature index 180

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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This edition includes the following significant technical changes with respect to the previous edition:

- modification of the title;
- revision to the Scope;
- revision to 3.2.2.

The text of this standard is based on the first edition, its Amendment 1 and the following documents:

CDV	Report on voting
55/1767/CDV	55/1816/RVC

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

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

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 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.

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INTRODUCTION

This part of IEC 60317 forms an element of a series of standards 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).

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SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 71: Polyester glass-fibre wound ~~fused~~ and resin or varnish impregnated, bare or enamelled round copper wire, temperature index 180

1 Scope

This part of IEC 60317 specifies the requirements of polyester glass-fibre wound ~~fused~~ resin or varnish impregnated, bare, grade 1 or grade 2 enamelled round copper winding wire, temperature index 180. ~~The impregnating agent can be, for instance, epoxy, polyester, or polyesterimide resin based.~~

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 nominal conductor diameters are specified in IEC 60317-0-10:2017, Clause 4.

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 60317-0-10:2017, *Specifications for particular types of winding wires – Part 0-10: General requirements – Polyester glass-fibre wound fused, unvarnished, or resin or varnish impregnated, bare or enamelled round copper wire*

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 60317-0-10 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>

3.2 General notes

3.2.1 Methods of test

Subclause 3.2.1 of IEC 60317-0-10:2017 applies. In case of inconsistencies between IEC 60317-0-10 and this document, the latter shall prevail.

3.2.2 Winding wire

The fibre covering shall consist of a combination of polyester and glass fibres. The glass fibres shall be electrical-grade continuous-filament glass yarn. The polyester fibre shall be a high-grade yarn resulting from the linear polymerization of ethylene glycol and terephthalic acid. The maximum content by weight of polyester fibre in the yarn shall not exceed 50 %.

The enamelled wire shall have a temperature index of at least 180 and shall be agreed between purchaser and supplier.

The temperature index of the wire is dependent upon the type of impregnating agent used. The impregnating agent applied to the polyester glass fibre shall have a minimum temperature index of 180.

The ~~coating~~ covering shall ~~be characterized by~~ have one of the following ~~different~~ grades of thickness:

- PG1: bare conductor with 1 layer of polyester glass fibre or 2 layers of finer polyester glass fibres that together, comply with the dimensional requirements in IEC 60317-0-10;
- PG2: bare conductor with 2 layers of polyester glass fibre;
- grade 1 PG1: enamelled grade 1 (grade 1) with 1 layer of polyester glass fibre (PG1);
- grade 1 PG2: enamelled grade 1 (grade 1) with 2 layers of polyester glass fibre (PG2);
- grade 2 PG1: enamelled grade 2 (grade 2) with 1 layer of polyester glass fibre (PG1);
- grade 2 PG2: enamelled grade 2 (grade 2) with 2 layers of polyester glass fibre (PG2).

3.3 Appearance

Subclause 3.3 of IEC 60317-0-10:2017 applies.

4 Dimensions

Clause 4 of IEC 60317-0-10:2017 applies.

5 Electrical resistance

Clause 5 of IEC 60317-0-10:2017 applies.

6 Elongation

Clause 6 of IEC 60317-0-10:2017 applies.

7 Springiness

Clause 7 of IEC 60317-0-10:2017 applies.

8 Flexibility and adherence

Clause 8 of IEC 60317-0-10:2017 applies.

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

Clause 13 of IEC 60317-0-10:2017 applies.

14 Continuity of insulation

Test inappropriate.

15 Temperature index

Clause 15 of IEC 60317-0-10:2017 applies.

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.

21 Loss of mass

Test inappropriate.

23 Pin hole test

Test inappropriate.

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30 Packaging

Clause 30 of IEC 60317-0-10:2017 applies.

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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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**Specifications for particular types of winding wires –
Part 71: Polyester glass-fibre wound and resin or varnish impregnated, bare or
enamelled round copper wire, temperature index 180**

**Spécifications pour types particuliers de fils de bobinage –
Partie 71: Fil de section circulaire en cuivre nu ou émaillé, guipé de fibres de
verre polyester imprégnées de vernis ou de résine, d'indice de température 180**

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SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 71: Polyester glass-fibre wound and resin or varnish impregnated, bare or enamelled round copper wire, temperature index 180

1 Scope

This part of IEC 60317 specifies the requirements of polyester glass-fibre wound resin/varnish impregnated, bare, grade 1 or grade 2 enamelled round copper winding wire, temperature index 180.

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 nominal conductor diameters are specified in IEC 60317-0-10:2017, Clause 4.

2 Normative references

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

3.2 General notes

3.2.1 Methods of test

Subclause 3.2.1 of IEC 60317-0-10:2017 applies. In case of inconsistencies between IEC 60317-0-10 and this document, the latter shall prevail.

3.2.2 Winding wire

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The temperature index of the wire is dependent upon the type of impregnating agent used. The impregnating agent applied to the polyester glass fibre shall have a minimum temperature index of 180.

The covering shall have one of the following grades of thickness:

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- PG2: bare conductor with 2 layers of polyester glass fibre;
- grade 1 PG1: enamelled grade 1 (grade 1) with 1 layer of polyester glass fibre (PG1);
- grade 1 PG2: enamelled grade 1 (grade 1) with 2 layers of polyester glass fibre (PG2);
- grade 2 PG1: enamelled grade 2 (grade 2) with 1 layer of polyester glass fibre (PG1);
- grade 2 PG2: enamelled grade 2 (grade 2) with 2 layers of polyester glass fibre (PG2).

3.3 Appearance

Subclause 3.3 of IEC 60317-0-10:2017 applies.

4 Dimensions

Clause 4 of IEC 60317-0-10:2017 applies.

5 Electrical resistance

Clause 5 of IEC 60317-0-10:2017 applies.

6 Elongation

Clause 6 of IEC 60317-0-10:2017 applies.

7 Springiness

Clause 7 of IEC 60317-0-10:2017 applies.

8 Flexibility and adherence

Clause 8 of IEC 60317-0-10:2017 applies.

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

Clause 13 of IEC 60317-0-10:2017 applies.

14 Continuity of insulation

Test inappropriate.

15 Temperature index

Clause 15 of IEC 60317-0-10:2017 applies.

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.

21 Loss of mass

Test inappropriate.

23 Pin hole test

Test inappropriate.

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30 Packaging

Clause 30 of IEC 60317-0-10:2017 applies.

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

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

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

SPÉCIFICATIONS POUR TYPES PARTICULIERS DE FILS DE BOBINAGE –**Partie 71: Fil de section circulaire en cuivre nu ou émaillé, guipé de fibres de verre polyester imprégnées de vernis ou de résine, d'indice de température 180**

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La Norme internationale IEC 60317-71 a été établie par le comité d'études 55 de l'IEC: Fils de bobinage.

Cette deuxième édition de l'IEC 60317-71 annule et remplace la première édition parue en 2017. Le document 55/1767/CDV, circulé comme Amendement 1 auprès des Comités nationaux de l'IEC, a conduit à la publication de cette nouvelle édition.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- modification du titre;

- révision du Domaine d'application;
- révision du 3.2.2.

Le texte de cette norme est issu des documents suivants:

CDV	Rapport de vote
55/1767/CDV	55/1816/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette Norme internationale.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2.

Une liste de toutes les parties de l'IEC 60317, publiées sous le titre général *Spécifications pour types particuliers de fils de bobinage*, peut être consultée sur le site web de l'IEC.

La numérotation des articles de la présente norme n'est pas continue entre les Articles 21 et 30 afin de réserver un espace pour d'éventuelles futures exigences applicables au fil avant celles applicables au conditionnement du fil.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous "<http://webstore.iec.ch>" dans les données relatives au document recherché. A cette date, le document sera

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INTRODUCTION

La présente partie de l'IEC 60317 appartient à l'une des séries de normes qui traitent des fils isolés utilisés pour les enroulements des appareils électriques. L'ensemble est composé des trois séries de normes suivantes:

- 1) *Fils de bobinage – Méthodes d'essai* (série IEC 60851);
- 2) *Spécifications pour types particuliers de fils de bobinage* (série IEC 60317);
- 3) *Conditionnement des fils de bobinage* (série IEC 60264).

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