

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Specifications for particular types of winding wires –
Part 80: Polyvinyl acetal enamelled rectangular copper wire, class 120,
with a bonding layer

Spécifications pour types particuliers de fils de bobinage –
Partie 80: Fil de section rectangulaire en cuivre émaillé avec acétal
de polyvinyle, classe 120, avec une couche adhérente



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CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms, definitions, general notes and appearance.....	6
3.1 Terms and definitions.....	6
3.2 General notes	7
3.2.1 Methods of test.....	7
3.2.2 Winding wire.....	7
3.3 Appearance	7
4 Dimensions.....	7
4.1 Conductor dimensions	7
4.2 Enamel layer.....	7
4.3 Bonding layer.....	7
5 Electrical resistance	7
6 Elongation	7
7 Springiness	7
8 Flexibility and adherence.....	8
8.1 Mandrel winding test.....	8
8.2 Adherence test.....	8
9 Heat shock	8
10 Cut-through	8
11 Resistance to abrasion	8
12 Resistance to solvents.....	8
13 Breakdown voltage	8
14 Continuity of insulation	8
15 Temperature index	8
16 Resistance to refrigerants.....	9
17 Solderability	9
18 Heat or solvent bonding.....	9
18.1 Heat bonding	9
18.1.1 Room temperature	9
18.1.2 Elevated temperature	9
18.2 Solvent bonding	9
19 Dielectric dissipation factor.....	9
20 Resistance to transformer oil	9
21 Loss of mass	9
23 Pin hole test	9
30 Packaging	9
Bibliography.....	10
Table 1 – Mandrel winding	8

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[IEC 60317-80:2019](#)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –**Part 80: Polyvinyl acetal enamelled rectangular copper wire,
class 120, with a bonding layer**

FOREWORD

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International Standard IEC 60317-80 has been prepared by IEC technical committee 55: Winding wires.

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

FDIS	Report on voting
55/1790/FDIS	55/1802/RVD

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.

This International Standard is to be read in conjunction with IEC 60317-0-2:2019.

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.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific document. At this date, the document will be

- reconfirmed,
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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. 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 80: Polyvinyl acetal enamelled rectangular copper wire, class 120, with a bonding layer

1 Scope

This part of IEC 60317 specifies the requirements of enamelled rectangular copper winding wire of class 120 with a dual coating. The underlying coating is based on polyvinyl acetal resin, which can be modified providing it retains the chemical identity of the original resin and meets all specified wire requirements. The second coating is a bonding layer based on a thermoplastic or thermosetting resin.

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 dimensions covered by this document is:

- width: min. 2,00 mm max. 16,00 mm;
- thickness: min. 0,80 mm max. 5,60 mm.

Wires of grade 1 and grade 2 are included in this specification and apply to the complete range of conductors.

The specified combinations of nominal width and thickness as well as the specified ratio width/thickness are given in IEC 60317-0-2:2019.

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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 60317-0-2:2019¹, *Specifications for particular types of winding wires – Part 0-2: General requirements – Enamelled rectangular copper wire*

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 60317-0-2:2019 apply.

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

¹ Under preparation. Stage at the time of publication: IEC CDV 60317-0-2:2019.

- 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 60317-0-2:2019 applies. In case of inconsistencies between IEC 60317-0-2:2019 and this part of IEC 60317, this document IEC 60317-80 shall prevail.

3.2.2 Winding wire

Class 120 is a thermal class that requires a minimum temperature index of 120 and a heat shock temperature of at least 155 °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 60317-0-2:2019 applies.

4 Dimensions

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4.1 Conductor dimensions (standards.iteh.ai)

Subclause 4.1 of IEC 60317-0-2:2019 applies.

[IEC 60317-80:2019](#)

4.2 Enamel layer <https://standards.iteh.ai/catalog/standards/sist/b9816d8b-bc33-4db5-8739-671888da691d/iec-60317-80-2019>

Subclause 4.2 of IEC 60317-0-2:2019 applies.

4.3 Bonding layer

Clause 4.4.2 of IEC 60317-0-2:2019 applies.

5 Electrical resistance

Clause 5 of IEC 60317-0-2:2019 applies.

6 Elongation

Clause 6 of IEC 60317-0-2:2019 applies.

NOTE When the value of the proof strength of the copper is specified between minimum and maximum limits, the requirements are agreed upon between the purchaser and supplier. The description of the term "proof strength" and the method of determination are given in ISO 6892-1:2016.

7 Springiness

Clause 7 of IEC 60317-0-2:2019 applies.

8 Flexibility and adherence

8.1 Mandrel winding test

The coating shall show no cracking after the wire has been bent flatwise and edgewise on a mandrel with a diameter as specified in Table 1.

Table 1 – Mandrel winding

Wire size		Mandrel diameter
Width	Sizes up to and including 10 mm	2 × width
	Sizes over 10 mm	3 × width
Thickness	All sizes	2 × thickness

8.2 Adherence test

The wire shall be stretched by 20 % or to the break, whichever is less. The distance of loss of adhesion shall be less than 1 × width.

9 Heat shock

Clause 9 of IEC 60317-0-2:2019 applies, where the minimum heat shock temperature shall be 155 °C.

10 Cut-through

Test requirements under consideration. <https://standards.iteh.ai/catalog/standards/sist/b9816d8b-bc33-4db5-8739-671888da691d/iec-60317-80-2019>

11 Resistance to abrasion

Test inappropriate.

12 Resistance to solvents

Test requirements under consideration.

13 Breakdown voltage

Clause 13 of IEC 60317-0-2:2019 applies, where the elevated temperature shall be 120 °C.

14 Continuity of insulation

Test inappropriate.

15 Temperature index

Clause 15 of IEC 60317-0-2:2019 applies, where the minimum temperature index shall be 120.

16 Resistance to refrigerants

Test inappropriate.

17 Solderability

Test inappropriate.

18 Heat or solvent bonding

18.1 Heat bonding

18.1.1 Room temperature

Test requirements under consideration.

18.1.2 Elevated temperature

Test requirements under consideration, and shall be agreed upon between customer and supplier.

18.2 Solvent bonding

Test inappropriate.

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19 Dielectric dissipation factor

[IEC 60317-80:2019](#)

Test inappropriate. <https://standards.iteh.ai/catalog/standards/sist/b9816d8b-bc33-4db5-8739-671888da691d/iec-60317-80-2019>

20 Resistance to transformer oil

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

21 Loss of mass

Test inappropriate.

23 Pin hole test

Test inappropriate.

30 Packaging

Clause 30 of IEC 60317-0-2:2019 applies.