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INTERNATIONAL STANDARD

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Specifications for particular types of winding wires –
Part 18: Polyvinyl acetal enamelled rectangular copper wire, class 120

IEC 60317-18:2020-06 RLV(en)

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SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 18: Polyvinyl acetal enamelled rectangular copper wire, class 120

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International Standard IEC 60317-18 has been prepared by IEC technical committee 55: Winding wires.

This fourth edition cancels and replaces the third edition published in 2004 and Amendment 1:2009. This edition constitutes a technical revision.

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

a) modification of the Scope (Clause 1);
b) revision to thermal class designation from 105 to 120 in 3.2.2;
c) renaming of stretching test to adherence test, and modification to the requirements in 8.2;
d) revision to the cut-through requirement in Clause 10.

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

FDIS	Report on voting
55/1843/FDIS	55/1856/RVD

Full information on the voting for the approval of this document 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 used in conjunction with IEC 60317-0-2:2020.

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 document 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,
- withdrawn,
- replaced by a revised edition, or
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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 18: Polyvinyl acetal enamelled rectangular copper wire, class 120

1 Scope

This part of IEC 60317 specifies the requirements of enamelled rectangular copper winding wires of class 120 with a sole coating based on polyvinyl acetal or polyvinyl formal resin, which ~~may~~ can be modified provided it retains the chemical identity of the original resin and meets all specified wire requirements

NOTE 1 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 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.~~

NOTE 2 Polyvinyl acetal is a general name for a family of thermoplastic vinyl resins produced by the condensation of polyvinyl alcohol with an aldehyde. Examples are polyvinyl acetal, polyvinyl formal and polyvinyl butyral.

The range of nominal conductor dimensions covered by this document is:

~~– width: minimum 2,0 mm; maximum 16,0 mm;~~

~~thickness: minimum 0,80 mm; maximum 5,60 mm.~~

– width: min. 2,0 mm max. 31,5 mm;
– thickness: min. 0,80 mm max. 10,0 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 width and thickness as well as the specified ratio width/thickness are given in IEC 60317-0-2.

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 60317-0-2:2020, *Specifications for particular types of winding wires – Part 0-2: General requirements – Enamelled rectangular copper wire*

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

~~**3.1 Definitions and general notes on methods of test**~~

~~For definitions and general notes on methods of test, see Clause 3 of IEC 60317-0-2.~~

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~~In case of inconsistencies between IEC 60317-0-2 and this standard, IEC 60317-18 shall prevail.~~

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60317-0-2 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 of IEC 60317-0-2:2020 applies. In case of inconsistencies between IEC 60317-0-2 and this document, IEC 60317-18 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 60317-0-2:2020 applies.

4 Dimensions

Clause 4 of IEC 60317-0-2:2020 applies.

5 Electrical resistance

Clause 5 of IEC 60317-0-2:2020 applies.

6 Elongation

Clause 6 of IEC 60317-0-2:2020 applies.

7 Springiness

Clause 7 of IEC 60317-0-2:2020 applies.

8 Flexibility and adherence

8.1 Mandrel winding test

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

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Table 1 – Mandrel winding

Wire bent on		Mandrel diameter
Width	Sizes up to and including 10 mm Sizes over 10 mm	2 × width 3 × width
Thickness	All dimensions	2 × thickness

8.2 ~~Stretching~~ Adherence test

The wire shall be stretched by 20 % or until it breaks, whichever is less.

The distance of loss of adhesion shall be less than 1 x ~~width~~ thickness.

9 Heat shock

Clause 9 of IEC 60317-0-2:2020 applies, where the minimum heat shock temperature shall be 155 °C.

10 Cut-through

Test ~~requirements~~ under consideration.

11 Resistance to abrasion

Test inappropriate.

12 Resistance to solvents

Clause 12 of IEC 60317-0-2:2020 applies.

13 Breakdown voltage

Clause 13 of IEC 60317-0-2:2020 applies, where the elevated temperature shall be 120 °C.

14 Continuity of insulation

Test inappropriate.

15 Temperature index

Clause 15 of IEC 60317-0-2:2020 applies, where the minimum temperature index shall be 120.

16 Resistance to refrigerants

Test inappropriate.

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17 Solderability

Test inappropriate.

18 Heat or solvent bonding

Test inappropriate.

19 Dielectric dissipation factor

Test inappropriate.

20 Resistance to transformer oil

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

21 Loss of mass

Test inappropriate.

23 Pin hole test

Test inappropriate.

30 Packaging

Clause 30 of IEC 60317-0-2:2020 applies.

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