

SRI LANKA STANDARD 1081 : Part 4 : 2009
IEC 60317-8 : 1997

SPECIFICATION FOR WINDING WIRES
PART 4 : POLYESTERIMIDE ENAMELLED
ROUND COPPER WIRE, CLASS 180
(First Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
SPECIFICATION FOR WINDING WIRES
PART 4 : POLYESTERIMIDE ENAMELLED ROUND COPPER WIRE, CLASS 180
(First Revision)

SLS 1081 : Part 4 : 2009
IEC 60317-8 : 1997

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Sri Lanka Standard
SPECIFICATION FOR WINDING WIRES
PART 4 : POLYESTERIMIDE ENAMELLED ROUND COPPER WIRE, CLASS 180
(First Revision)

NATIONAL FOREWORD

This standard was approved by the Sectoral Committee on Electric Cables and Conductors and was authorized for adoption and publication as a Sri Lanka Standard by the Council of Sri Lanka Standards Institution on 2009-10-28.

This is the first revision of **SLS 1081 : Part 4 : 1995** and identical with **IEC 60317-8 : Specifications for particular types of winding wires, Part 4 : Polyesterimide enamelled round copper wire, class 180, Edition 3.2 1997-12**, published by the International Electrotechnical Commission (IEC).

Terminology and Conventions

The text of the International Standard has been accepted as suitable for publication, without deviation, as a Sri Lanka Standard. However, certain terminology and conventions are not identical with those used in Sri Lanka Standards.

Attention is therefore drawn to the following:

- a) Wherever the words “International Standard” appear referring to this standard they should be interpreted as “Sri Lanka Standard”.
- b) Wherever the page numbers are quoted they are page numbers of IEC standard.
- c) The coma has been used throughout as a decimal marker. In Sri Lanka Standards it is the current practice to use a full point on the base line as the decimal marker.

Cross references

International Standard

Corresponding Sri Lanka Standard

IEC 60317-0-1: 2000 : Specifications
for particular types of Winding wires.
Part 0 : General Requirements
Section 1 : Enamelled round copper wire.



IEC 60317-8

Edition 3.2 1997-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Specifications for particular types of winding wires –
Part 8: Polyesterimide enamelled round copper wire, class 180**

**Spécifications pour types particuliers de fils de bobinage –
Partie 8: Fil de section circulaire en cuivre émaillé avec polyesterimide,
classe 180**





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INTERNATIONAL STANDARD

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**Specifications for particular types of winding wires –
Part 8: Polyesterimide enamelled round copper wire, class 180**

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classe 180**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SPECIFICATIONS FOR PARTICULAR TYPES
OF WINDING WIRES –****Part 8: Polyesterimide enamelled round copper wire,
class 180**

FOREWORD

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International Standard 60317-8 has been prepared by IEC technical committee 55: Winding wires.

This third edition of IEC 60317-8 replaces the second edition issued in 1988.

This consolidated version of IEC 60317-8 consists of the third edition (1990) its amendment 1 (1997) [documents 55/527/FDIS and 55/563/RVD] and its amendment 2 (1997) [documents 55/560/FDIS and 55/604/RVD].

The technical content is therefore identical to the base edition and its amendments and has been prepared for user convenience.

It bears the edition number 3.2.

A vertical line in the margin shows where the base publication has been modified by amendments 1 and 2.

INTRODUCTION

This International Standard is one of a series which deals with insulated wires used for windings in electrical equipment. The series has three groups describing:

- 1) methods of test (IEC 60851) ;
- 2) specifications (IEC 60317);
- 3) packaging (IEC 60264).

SPECIFICATIONS FOR PARTICULAR TYPES OF WINDING WIRES –

Part 8: Polyesterimide enamelled round copper wire, class 180

1 Scope

This International Standard specifies the requirements of enamelled round copper winding wire of class 180 with a sole coating based on polyesterimide resin, which may be modified provided 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.

Class 180 is a thermal class that requires a minimum temperature index of 180 and a heat shock temperature of at least 200 °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.

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

- Grade 1: 0,018 mm up to and including 3,150 mm;
- Grade 2: 0,020 mm up to and including 5,000 mm;
- Grade 3: 0,250 mm up to and including 1,600 mm.

The nominal conductor diameters are specified in clause 4 of IEC 60317-0-1.

2 Normative references

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid international standards.

IEC 60317-0-1: 1990, *Specifications for particular types of winding wires - Part 0: General requirements - Section 1: Enamelled round copper wire.*

3 Definitions and general notes on methods of test

For definitions and general notes on methods of test see clause 3 of IEC 60317-0-1.

In case of inconsistencies between IEC 60317-0-1 and this standard, IEC 60317-8 shall prevail.

4 Dimensions

See clause 4 of IEC 60317-0-1.

5 Electrical resistance

See clause 5 of IEC 60317-0-1.

6 Elongation

See clause 6 of IEC 60317-0-1.

7 Springiness

See clause 7 of IEC 60317-0-1.

8 Flexibility and adherence

See clause 8 of IEC 60317-0-1, where the constant K used for the calculation of the number of revolutions for the peel test shall be 110 mm.

9 Heat shock

See clause 9 of IEC 60317-0-1, where the minimum heat shock temperature shall be 200 °C.

10 Cut-through

No failure shall occur within 2 min at 300 °C.

11 Resistance to abrasion (nominal conductor diameters from 0,250 mm 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 mm	Grade 1		Grade 2		Grade 3	
	Minimum average force to failure N	Minimum force to failure of each measurement N	Minimum average force to failure N	Minimum force to failure of each measurement N	Minimum average force to failure N	Minimum force to failure of each measurement N
0,250	2,85	2,45	4,70	4,00	5,80	4,90
0,280	3,10	2,60	5,05	4,30	6,25	5,30
0,315	3,35	2,80	5,45	4,60	6,70	5,70
0,355	3,60	3,05	5,85	4,95	7,20	6,10
0,400	3,85	3,25	6,25	5,30	7,70	6,50
0,450	4,15	3,50	6,75	5,70	8,25	7,00
0,500	4,45	3,75	7,20	6,10	8,85	7,50
0,560	4,75	4,05	7,70	6,50	9,50	8,05
0,630	5,10	4,35	8,25	7,00	10,2	8,65
0,710	5,45	4,65	8,85	7,50	10,9	9,25
0,800	5,85	4,95	9,50	8,05	11,7	9,90
0,900	6,30	5,35	10,2	8,60	12,5	10,6
1,000	6,75	5,75	10,9	9,20	13,3	11,3
1,120	7,35	6,20	11,6	9,80	14,2	12,0
1,250	7,90	6,70	12,5	10,5	15,2	12,9
1,400	8,50	7,20	13,3	11,3	16,4	13,9
1,600	9,20	7,80	14,3	12,1	17,6	14,9
1,800	9,95	8,40	15,4	13,0	-	-
2,000	10,6	9,00	16,4	13,9	-	-
2,240	11,7	9,90	17,5	14,8	-	-
2,500	12,8	10,8	18,6	15,8	-	-

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

12 Resistance to solvents

See clause 12 of IEC 60317-0-1, however, the change shall not exceed three grades of pencil hardness.

13 Breakdown voltage

See clause 13 of IEC 60317-0-1, where the elevated temperature shall be 180 °C.

14 Continuity of insulation

See clause 14 of IEC 60317-0-1.

15 Temperature index

See clause 15 of IEC 60317-0-1, where the minimum temperature index shall be 180.

16 Resistance to refrigerants

The percentage of extractable matter shall not exceed 0,5 %. The requirement for breakdown voltage shall be 75 % of the minimum specified value.

16.1 Extraction with trichloroethylene or with methanol

The percentage of extractable matter shall not exceed the figure given in table 2.

The solvent shall be agreed between purchaser and supplier.

Table 2 - Extraction

Nominal conductor diameter mm		Extractable matter %
Over	Up to and including	
-	0,500	1,5
0,500	1,000	1,0
1,000	3,000	0,8

16.2 Extraction with monochlorodifluoromethane (refrigerant 22)

The percentage of extractable matter shall not exceed the figure given in table 3.

Table 3 - Extraction (R22)

Nominal conductor diameter mm		Extractable matter %
Over	Up to and including	
-	0,500	1,0
0,500	1,000	0,8
1,000	3,000	0,6

16.3 Blistering in monochlorodifluoromethane (refrigerant 22)

This test is made only when agreed between purchaser and supplier.

None of the specimens shall show more than four blisters. Any blister less than half the diameter of the wire shall be ignored when the piece of coating affected is still firmly attached to the rest of the coating.

The adherence of the coating after the blister test is checked by winding the wire on a mandrel of $4D^*$; the wire shall then show no cracks.

* D is the overall diameter of the wire.

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 inappropriate.

22 High temperature failure

This clause is deleted.

30 Packaging

See clause 30 of IEC 60317-0-1.

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