

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Winding wires – Test methods –
Part 5: Electrical properties**

**Fils de bobinage – Méthodes d'essai –
Partie 5: Propriétés électriques**



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IEC 60851-5

Edition 4.0 2008-07

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

U

ICS 29.060.10

ISBN 2-8318-9937-0

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Test 5: Electrical resistance.....	7
4 Test 13: Breakdown voltage	8
4.1 Principle.....	8
4.2 Equipment.....	8
4.3 Enamelled round wire with a nominal conductor diameter up to and including 0,100 mm	9
4.4 Enamelled round wire with a nominal conductor diameter over 0,100 mm up to and including 2,500 mm.....	10
4.4.1 Test at room temperature	10
4.4.2 Test at elevated temperature	11
4.5 Round wire with a nominal conductor diameter over 2,500 mm.....	12
4.5.1 Test at room temperature	12
4.5.2 Test at elevated temperature	14
4.6 Fibre wound round wire	14
4.6.1 Test at room temperature	14
4.6.2 Test at elevated temperature	16
4.7 Rectangular wire	16
4.7.1 Test at room temperature	16
4.7.2 Test at elevated temperature	16
5 Test 14: Continuity of insulation (applicable to enamelled round and tape wrapped round wire).....	17
5.1 General.....	17
5.2 Low-voltage continuity (nominal conductor diameter up to and including 0,050 mm).....	17
5.3 High-voltage continuity (nominal conductor diameter over 0,050 mm up to and including 1,600 mm)	17
5.3.1 Principle	17
5.3.2 Equipment.....	18
5.3.3 Procedure.....	21
5.3.4 Result.....	22
6 Test 19: Dielectric dissipation factor (applicable to enamelled wire and bunched wire).....	22
6.1 Principle.....	22
6.2 Equipment.....	22
6.3 Specimen	23
6.3.1 Specimen for a metal bath electrode.....	23
6.3.2 Specimen for a conductive suspension electrode.....	23
6.4 Procedure	24
6.5 Result	24
7 Test 23: Pin hole test.....	24
Annex A (informative) Dissipation factor methods	25

Figure 1 – Arrangement of cylinder and specimen for the breakdown voltage test..... 10

Figure 2 – Device for twisting the specimen for breakdown voltage test	11
Figure 3 – U-bend specimen for the breakdown voltage test (specimen placed in shot bath)	13
Figure 4 – Coil-wound specimen for the breakdown voltage test	15
Figure 5 – Apparatus for testing the low-voltage continuity of covering	17
Figure 6 – High-voltage d.c. continuity – Pulleys for wire size 0,050 mm to 0,250 mm	19
Figure 7 – Pulley dimensions and spacing for wire size 0,250 mm to 1,600 mm	19
Figure 8a – Graphite fibre single brush electrode assembly	20
Figure 8b – Graphite fibre dual brush electrode assembly	21
Figure 8 – Graphite fibre single or dual brush electrode assembly	21
Figure 9 – Suitable electrode arrangement for testing the dielectric dissipation factor	23
Figure A.1 – Example of linear method for sole coating	27
Figure A.2 – Example of logarithmic method for sole coating	27
Table 1 – Rates of test voltage increase	8
Table 2 – Loads applied to the wire	9
Table 3 – Loads applied to the wire and number of twists	11
Table 4 – Fault currents	18
Table 5 – Test voltages	22

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**WINDING WIRES –
TEST METHODS –****Part 5: Electrical properties**

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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International Standard IEC 60851-5 has been prepared by IEC technical committee 55: Winding wires.

This fourth edition cancels and replaces the third edition (1996) and its amendments 1 (1997) and 2 (2004). It constitutes a technical revision.

Significant revisions to the previous edition include the following points:

- in Subclause 5.3, the addition of the use of carbon brush electrodes for the counting discontinuities during the high voltage continuity test, as an alternative to the V-groove pulley electrode;
- clarifications in the breakdown voltage test for round wires larger than 2,500 mm and for fibrous covered wires.

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

FDIS	Report on voting
55/1069/FDIS	55/1078/RVD

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

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

A list of all the parts in the IEC 60851 series, under the general title *Winding wires – Test methods*, can be found on the website.

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

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

INTRODUCTION

This part of IEC 60851 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

- a) winding wires – Test methods (IEC 60851);
- b) specifications for particular types of winding wires (IEC 60317);
- c) packaging of winding wires (IEC 60264).

WINDING WIRES – TEST METHODS –

Part 5: Electrical properties

1 Scope

This part of IEC 60851 specifies the following tests:

- Test 5: Electrical resistance;
- Test 13: Breakdown voltage;
- Test 14: Continuity of insulation;
- Test 19: Dielectric dissipation factor;
- Test 23: Pin hole.

For definitions, general notes on methods of test and the complete series of methods of test for winding wires, see IEC 60851-1.

2 Normative references

The following referenced documents are indispensable for the application 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 60851-1, *Winding wires – Test methods – Part 1: General*

3 Test 5: Electrical resistance

Electrical resistance is the d.c. resistance at 20 °C of 1 m of wire.

The method used shall provide a precision of 0,5 %.

For bunched wires a length of up to 10 m shall be used and the ends shall be soldered before the measurement. When measuring the resistance to check for an excessive number of broken wires, a length of 10 m of bunched wire shall be used.

If the resistance R_t is measured at a temperature t other than 20 °C, the resistance R_{20} at 20 °C shall be calculated by means of the following formula:

$$R_{20} = \frac{R_t}{1 + \alpha(t - 20)}$$

where

t is the actual temperature in degrees Celsius during the measurement;

α is the temperature coefficient in K⁻¹.