

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Winding wires – Test methods –  
Part 4: Chemical properties**

**Fils de bobinage – Méthodes d'essai –  
Partie 4: Propriétés chimiques**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**WINDING WIRES – TEST METHODS –****Part 4: Chemical properties**

## FOREWORD

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International Standard IEC 60851-4 has been prepared by IEC technical committee 55: Winding wires.

This third edition cancels and replaces the second edition published in 1996, Amendment 1:1997 and Amendment 2:2005. This edition constitutes a technical revision.

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

- a) revision of Test 16: Resistance to refrigerants;
- b) revision of Test 17: Solderability;
- c) new Annex A for alternative refrigerants to monochlorodifluoromethane (R 22).

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

FDIS	Report on voting
55/1578/FDIS	55/1580/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, published under the general title *Winding Wires – Test methods*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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

The IEC 60851 series is part of a group of International Standards which define insulated wires used for windings in electrical equipment:

- 1) IEC 60851 series, *Winding wires – Test methods*;
- 2) IEC 60317 series, *Specifications for particular types of winding wires*;
- 3) IEC 60264 series, *Packaging of winding wires*.

## WINDING WIRES – TEST METHODS –

### Part 4: Chemical properties

#### 1 Scope

This part of IEC 60851 specifies the following chemical properties tests:

- Test 12: Resistance to solvents;
- Test 16: Resistance to refrigerants;
- Test 17: Solderability;
- Test 20: Resistance to transformer oil.

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 documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60296, *Fluids for electrotechnical applications – Unused mineral insulating oils for transformers and switchgear*

IEC 60554-1:1977, *Specification for cellulosic papers for electrical purposes – Part 1: Definitions and general requirements*

IEC 60851-1, *Winding wires – Test methods – Part 1: General*

IEC 60851-3:2009, *Winding wires – Test methods – Part 3: Mechanical properties*

IEC 60851-5:2008, *Winding wires – Test methods – Part 5: Electrical properties*

ISO 9453, *Soft solder alloys – Chemical compositions and forms*

#### 3 Test 12: Resistance to solvents

##### 3.1 General

This test is applicable to enamelled round wire with a nominal conductor diameter over 0,250 mm and to enamelled rectangular wire.

The test is not suitable for round wires with a nominal conductor diameter up to and including 0,250 mm.

Resistance to solvents is expressed by the pencil hardness of the wire after solvent treatment.