



**NSAI**  
Standards

Irish Standard  
I.S. EN 60851-2:2009&A1:2015

## Winding wires - Test methods - Part 2: Determination of dimensions

**I.S. EN 60851-2:2009&A1:2015**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

EN 60851-2:2009/A1:2015

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**EN 60851-2:2009/A1**

July 2015

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English Version

**Winding wires - Test methods - Part 2: Determination of  
dimensions  
(IEC 60851-2:2009/AMD1:2015)**

Fils de bobinage - Méthodes d'essai - Partie 2:  
Détermination des dimensions  
(IEC 60851-2:2009/AMD1:2015)

Wickeldrähte - Prüfverfahren - Teil 2: Ermittlung der Maße  
(IEC 60851-2:2009/AMD1:2015)

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

**EN 60851-2:2009/A1:2015**

**European foreword**

The text of document 55/1520/FDIS, future IEC 60851-2:2009/A1, prepared by IEC/TC 55 "Winding wires" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60851-2:2009/A1:2015.

The following dates are fixed:

- latest date by which the document has to be implemented at (dop) 2016-03-25  
national level by publication of an identical national  
standard or by endorsement
- latest date by which the national standards conflicting with (dow) 2018-06-25  
the document have to be withdrawn

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60851-2**

December 2009

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Supersedes EN 60851-2:1996 + A1:1997 + A2:2003

English version

**Winding wires -  
Test methods -  
Part 2: Determination of dimensions  
(IEC 60851-2:2009)**

Fils de bobinage -  
Méthodes d'essai -  
Partie 2: Détermination des dimensions  
(CEI 60851-2:2009)

Wickeldrähte -  
Prüfverfahren -  
Teil 2: Ermittlung der Maße  
(IEC 60851-2:2009)

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**

## Foreword

The text of document 55/1144/FDIS, future edition 3 of IEC 60851-2, prepared by IEC TC 55, Winding wires, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60851-2 on 2009-11-01.

This European Standard supersedes EN 60851-2:1996 + A1:1997 + A2:2003.

Technical revisions of note include recognition of the use of optical micrometers in determining the dimensions of round and rectangular enamelled wire.

The following dates were fixed:

- |  |       |            |
|--|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2010-08-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn   | (dow) | 2012-11-01 |

Annex ZA has been added by CENELEC.

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## **Annex ZA** (normative)

### **Normative references to international publications with their corresponding European publications**

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60851-1	- <sup>1)</sup>	Winding wires - Test methods - Part 1: General	EN 60851-1	1996 <sup>2)</sup>
IEC 60851-5	2008	Winding wires - Test methods - Part 5: Electrical properties	EN 60851-5	2008

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<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

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**IEC 60851-2**

Edition 3.0 2009-09

# **INTERNATIONAL STANDARD**

# **NORME INTERNATIONALE**

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**Winding wires – Test methods –  
Part 2: Determination of dimensions**

**Fils de bobinage – Méthodes d'essai –  
Partie 2: Détermination des dimensions**



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**IEC 60851-2**

Edition 3.0 2009-09

# **INTERNATIONAL STANDARD**

## **NORME INTERNATIONALE**

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**Winding wires – Test methods –  
Part 2: Determination of dimensions**

**Fils de bobinage – Méthodes d'essai –  
Partie 2: Détermination des dimensions**

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### **WINDING WIRES – TEST METHODS –**

#### **Part 2: Determination of dimensions**

#### **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 60851-2 has been prepared by IEC technical committee 55: Winding wires.

This third edition cancels and replaces the second edition published in 1996 and its amendment 1 (1997) and amendment 2 (2003), and constitutes a technical revision.

Technical revisions of note include recognition of the use of optical micrometers in determining the dimensions of round and rectangular enamelled wire.

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

FDIS	Report on voting
55/1144/FDIS	55/1163/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 IEC 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) methods of test (IEC 60851);
- b) specifications (IEC 60317);
- c) packaging (IEC 60264).

## **WINDING WIRES – TEST METHODS –**

### **Part 2: Determination of dimensions**

#### **1 Scope**

This part of IEC 60851 specifies the following method of test:

- Test 4: Dimensions.

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*

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

#### **3 Test 4: Dimensions**

##### **3.1 Equipment**

##### **3.1.1 Round and rectangular wire**

The equipment used shall have a resolution of 2 µm or less for wires over 0,200 mm and for wires up to and including 0,200 mm, a resolution of 1 µm or less. Both mechanical contact and optical non-contact micrometers may be used. If mechanical contact micrometers are used, the ratio of measuring force and anvil diameter shall be in accordance with the range as given in Table 1a and Table 1b. The diameter range of the spindle and anvil is also given in Table 1a and Table 1b. If optical micrometers are used, the average of the readings shall be recorded as the diameter of the conductor. If a specific measuring equipment must be used, it shall be agreed upon between the customer and the supplier.

**Table 1 – Types of winding wires**

**Table 1a – Enamelled round wire**

Type of winding wire	Nominal conductor diameter mm	Anvil diameter mm	Measuring force(N)/anvil diameter(mm) = P(N/mm)
Enamelled round wire	≤ 0,100	2 to 8	$0,01 \leq P \leq 0,16$
	$0,100 < d \leq 0,45$	5 to 8	$0,16 < P \leq 0,32$
	> 0,45	5 to 8	$0,32 < P \leq 0,80$



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