

# Insulating materials — Industrial rigid round laminated tubes and rods based on thermosetting resins for electrical purposes —

## Part 2: Methods of test

The European Standard EN 61212-2:2006 has the status of a British Standard

ICS 29.035.01

## National foreword

This British Standard was published by BSI. It is the UK implementation of EN 61212-2:2006. It is identical with IEC 61212-2:2006. It supersedes BS EN 61212-2:1996 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee GEL/15, Material specifications, to Subcommittee GEL/15/3, Rigid fibrous reinforced laminates for electrical purposes.

A list of organizations represented on GEL/15/3 can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

**Compliance with a British Standard cannot confer immunity from legal obligations.**

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English version

**Insulating materials -  
Industrial rigid round laminated tubes and rods  
based on thermosetting resins for electrical purposes  
Part 2: Methods of test  
(IEC 61212-2:2006)**

Matériaux isolants -  
Tubes et barres industriels, rigides,  
ronds, stratifiés, à base de résines  
thermodurcissables, à usages électriques  
Partie 2: Méthodes d'essai  
(CEI 61212-2:2006)

Isolierstoffe -  
Runde Rohre und Stäbe aus  
technischen Schichtpressstoffen  
auf der Basis wärmehärtender Harze  
für elektrotechnische Zwecke  
Teil 2: Prüfverfahren  
(IEC 61212-2:2006)

This European Standard was approved by CENELEC on 2006-11-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**Central Secretariat: rue de Stassart 35, B - 1050 Brussels**

## **Foreword**

The text of document 15/273/FDIS, future edition 2 of IEC 61212-2, prepared by IEC TC 15, Solid electrical insulating materials, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61212-2 on 2006-11-01.

This European Standard supersedes EN 61212-2:1996.

The main changes from EN 61212-2:1996 are as follows:

- added application use and safety statements;
- reformatted document to bring it up to current IEC document format;
- test method references updated.

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) | 2007-08-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn                                               | (dow) | 2009-11-01 |

Annex ZA has been added by CENELEC.

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## **Endorsement notice**

The text of the International Standard IEC 61212-2:2006 was approved by CENELEC as a European Standard without any modification.

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# INTERNATIONAL STANDARD

**IEC**  
**61212-2**

Second edition  
2006-04

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**Insulating materials –  
Industrial rigid round laminated tubes  
and rods based on thermosetting resins  
for electrical purposes –**

**Part 2:  
Methods of test**



Reference number  
IEC 61212-2:2006(E)

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## INTRODUCTION

This part of IEC 61212 is one of a series which deals with industrial, rigid, round, laminated tubes and rods based on thermosetting resins for electrical purposes. The materials are similar to those described in IEC 62011-1 but of different cross-section.

This series, under the general heading *Insulating materials – Industrial rigid round laminated tubes and rods based on thermosetting resins for electrical purposes*, consists of three parts:

Part 1: Definitions, designations and general requirements (IEC 61212-1)

Part 2: Methods of test (IEC 61212-2)

Part 3: Specifications for individual materials (IEC 61212-3)

# INSULATING MATERIALS – INDUSTRIAL RIGID ROUND LAMINATED TUBES AND RODS BASED ON THERMOSETTING RESINS FOR ELECTRICAL PURPOSES –

## Part 2: Methods of test

### 1 Scope

This part of IEC 61212 describes methods of test for the materials defined in IEC 61212-1.

Materials which conform to this specification meet established levels of performance. However, the selection of a material by a user for a specific application should be based on the actual requirements necessary for adequate performance in that application and not based on this specification alone.

Safety warning:

It is the responsibility of the user of the methods contained or referred to in this document to ensure that they are used in a safe manner.

### 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 60167:1964, *Methods of test for the determination of the insulation resistance of solid insulating materials*

IEC 60212:1971, *Standard conditions for use prior to and during the testing of solid electrical insulating materials*

IEC 60216-1:2001, *Electrical insulating materials – Properties of thermal endurance – Part 1: Ageing procedures and evaluation of test results*

IEC 60216-2:2005, *Electrical insulating materials – Thermal endurance properties – Part 2: Determination of thermal endurance properties of electrical insulating materials – Choice of test criteria*

IEC 60243-1:1998, *Electrical strength of insulating materials – Test methods – Part 1: Tests at power frequencies*

IEC 60250:1969, *Recommended methods for the determination of the permittivity and dielectric dissipation factor of electrical insulating materials at power, audio and radio frequencies including metre wavelengths*

IEC 60296:2003, *Fluids for electrotechnical applications – Unused mineral oils for transformers and switchgear*

IEC 60695-11-10:1999, *Fire hazard testing – Part 11-10: Test flames – 50 W horizontal and vertical flame test methods*  
Amendment 1 (2003)<sup>1</sup>

IEC 61212-1, *Insulating materials – Industrial rigid round laminated tubes and rods based on thermosetting resins for electrical purposes – Part 1: General requirements*

IEC 61212-3 (all sheets), *Insulating materials – Industrial rigid round laminated tubes and rods based on thermosetting resins for electrical purposes – Part 3: Specifications for individual materials*

ISO 62:1999, *Plastics – Determination of water absorption*

ISO 178:2001, *Plastics – Determination of flexural properties*

ISO 604:2002, *Plastics – Determination of compressive properties*

ISO 1183-1:2004, *Plastics – Methods for determining the density and relative density of non-cellular plastics – Part 1: Immersion method, liquid pyknometer method and titration method*

ISO 3611:1978, *Micrometer callipers for external measurement*

ISO 3599:1976, *Vernier callipers reading to 0,1 and 0,05 mm*

ISO 6906:1984, *Vernier callipers reading to 0,02 mm*

### 3 Conditioning of specimens

Unless otherwise specified, test specimens shall be conditioned immediately prior to testing for at least 24 h in standard atmosphere B according to IEC 60212 at a temperature of 23 °C  $\pm$  2 K and a relative humidity of (50  $\pm$  5) %.

Unless otherwise specified, each specimen shall be tested in the conditioning atmosphere or the tests shall commence within 3 min of removal of each specimen from the conditioning atmosphere.

Where testing at an elevated temperature is required in a specification sheet of IEC 61212-3, test specimens shall be conditioned for 1 h at the elevated temperature immediately before testing.

### 4 Dimensions

#### 4.1 General

All dimensions shall be measured in the “as received” condition.

#### 4.2 External diameter

##### 4.2.1 Test apparatus

The external diameter of the tubes and rods shall be determined using one of the apparatus listed below:

<sup>1</sup> There exists a consolidated version 1.1 (2003) that includes IEC 60695-11-10 (1999) and its Amendment 1 (2003).