



**NSAI**  
Standards

Irish Standard  
I.S. EN 60695-10-2:2014

# Fire hazard testing - Part 10-2: Abnormal heat - Ball pressure test method

**I.S. EN 60695-10-2:2014**

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

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EUROPEAN STANDARD

**EN 60695-10-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2014

ICS 13.220.40; 29.020

Supersedes EN 60695-10-2:2003

English Version

**Fire hazard testing - Part 10-2: Abnormal heat - Ball pressure  
test method  
(IEC 60695-10-2:2014)**

Essais relatifs aux risques du feu - Partie 10-2: Chaleurs  
anormales - Essai à la bille  
(CEI 60695-10-2:2014)

Prüfungen zur Beurteilung der Brandgefahr - Teil 10-2:  
Unübliche Wärme - Kugeldruckprüfung  
(IEC 60695-10-2:2014)

This European Standard was approved by CENELEC on 2014-03-26. 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 CEN-CENELEC Management Centre or to any CENELEC member.

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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

## Foreword

The text of document 89/1203/FDIS, future edition 3 of IEC 60695-10-2, prepared by IEC/TC 89 "Fire hazard testing" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60695-10-2:2014.

The following dates are fixed:

- latest date by which the document has to be (dop) 2014-12-26  
implemented at national level by  
publication of an identical national  
standard or by endorsement
- latest date by which the national (dow) 2017-03-26  
standards conflicting with the  
document have to be withdrawn

This document supersedes EN 60695-10-2:2003.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

## Endorsement notice

The text of the International Standard IEC 60695-10-2:2014 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60695-1-10	NOTE	Harmonized as EN 60695-1-10.
IEC 60695-1-11	NOTE	Harmonized as EN 60695-1-11.
IEC 60695-4:2012	NOTE	Harmonized as EN 60695-4:2012 (not modified)
IEC 60695-10-3	NOTE	Harmonized as EN 60695-10-3.
ISO 306	NOTE	Harmonized as EN ISO 306.

## Annex ZA (normative)

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

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60216-4-1	-	Electrical insulating materials - Thermal endurance properties - Part 4-1: Ageing ovens - Single-chamber ovens	EN 60216-4-1	-
ISO 13943	2008	Fire safety - Vocabulary	EN ISO 13943	2010
ISO 3290-1	-	Rolling bearings - Balls - Part 1: Steel balls	-	-
IEC Guide 104	-	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-
ISO/IEC Guide 51	-	Safety aspects - Guidelines for their inclusion in standards	-	-
ISO 293	-	Plastics - Compression moulding of test specimens of thermoplastic materials	EN ISO 293	-
ISO 294	Series	Plastics - Injection moulding of test specimens of thermoplastic materials	EN ISO 294	Series
ISO 295	-	Plastics - Compression moulding of test specimens of thermosetting materials	EN ISO 295	-

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**IEC 60695-10-2**

Edition 3.0 2014-02

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

**Fire hazard testing –**

**Part 10-2: Abnormal heat – Ball pressure test method**

**Essais relatifs aux risques du feu –**

**Partie 10-2: Chaleurs anormales – Essai à la bille**



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**IEC 60695-10-2**

Edition 3.0 2014-02

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



BASIC SAFETY PUBLICATION

PUBLICATION FONDAMENTALE DE SÉCURITÉ

**Fire hazard testing –  
Part 10-2: Abnormal heat – Ball pressure test method**

**Essais relatifs aux risques du feu –  
Partie 10-2: Chaleurs anormales – Essai à la bille**

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## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	7
4 General description of the test method .....	7
5 Apparatus.....	7
5.1 Loading device.....	7
5.2 Test specimen support.....	8
5.3 Heating oven .....	8
5.4 Optical measuring instrument.....	9
5.5 Temperature measuring equipment.....	9
6 Test specimens .....	9
6.1 End product test method .....	9
6.2 Material Test method .....	9
6.2.1 Test specimen preparation .....	9
6.2.2 Test specimen dimensions.....	9
7 Conditioning .....	9
8 Test procedure .....	10
8.1 Selection of the test temperature .....	10
8.1.1 Method A – End product test method .....	10
8.1.2 Method B – Material performance test method .....	10
8.2 Heating oven and test apparatus setup .....	11
8.3 Test setup.....	11
8.4 Test specimen post conditioning .....	11
8.5 Measurements .....	12
9 Evaluation of test results .....	12
10 Information to be given in the relevant product standard.....	13
11 Test Report .....	13
Annex A (informative) Correlation between the ball pressure test and the Vicat test of ISO 306 .....	14
Annex B (informative) Depth indentation method .....	15
Bibliography.....	16
Figure 1 – Loading device (example) .....	8
Figure 2 – Measurement of dimension $d$ (example) .....	12
Table 1 – Suggested initial test temperatures .....	10

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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### FIRE HAZARD TESTING –

#### Part 10-2: Abnormal heat – Ball pressure test method

#### 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 60695-10-2 has been prepared by IEC technical committee 89: Fire hazard testing.

This third edition cancels and replaces the second edition of IEC 60695-10-2 published in 2003. It constitutes a technical revision.

It has the status of a basic safety publication in accordance with IEC Guide 104 and ISO/IEC Guide 51.

The main changes with respect to the previous edition are listed below:

- The addition of an introduction introduces the user to the basic guidance documents published by TC 89
- Addition of a reference to IEC Guide 104 and ISO/IEC Guide 51 in the Scope
- Additional relevant Terms and Definitions in new Clause 3

- 5.2: Additional requirements to the test specimen support at the suggestion of IECEE-CTL to improve reproducibility
- 5.3: Clarification of heating oven requirements at the suggestion of IECEE-CTL to improve reproducibility
- 5.4: Specification of minimum resolution consistent with method requirements for optical measurement instrument
- New Test Procedure in in Clauses 6 and 8 which introduces separate methods for End Product proof testing (Method A) and material performance testing (Method B)
- Updated Clause 11 Test Report to be consistent with other IEC 60695 documents.

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

FDIS	Report on voting
89/1203/FDIS	89/1210/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 60695 series, under the general title *Fire hazard testing*, can be found on the IEC web site.

The committee has decided that the contents of this publication will remain unchanged until the stability 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

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

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## INTRODUCTION

In the design of any electrotechnical product, the risk of abnormal heat and the potential hazards associated with abnormal heat need to be considered. In this respect the objective of component, circuit, and product design, as well as the choice of materials, is to reduce to acceptable levels the potential risks during normal operating conditions, reasonable foreseeable abnormal use, malfunction and/or failure. IEC/TC 89 has developed IEC 60695-1-10, together with its companion, IEC 60695-1-11, to provide guidance on how this is to be accomplished.

The primary aims of IEC 60695-1-10 and IEC 60695-1-11 are to provide guidance on how:

- a) to prevent ignition caused by an electrically energized component part, and
- b) to confine any resulting fire within the bounds of the enclosure of the electrotechnical product in the event of ignition.

Secondary aims of IEC 60695-1-10 and IEC 60695-1-11 include the minimization of any flame spread beyond the product's enclosure and the minimization of the harmful effects of fire effluents such as heat, smoke, toxicity and/or corrosivity.

Fires involving electrotechnical products can also be initiated from external non-electrical sources. Considerations of this nature should be dealt with in the overall fire hazard assessment.

This part of IEC 60695 describes a test method where the softening and accelerated material flow under load of a polymeric material is evaluated using a weighted ball-bearing in a heating oven. It should be used to measure, describe, and rank a property of a material in response to elevated temperatures under controlled laboratory conditions. This may be useful for the evaluation of materials for use in products that may be exposed to excess thermal stress. It should also be used for the evaluation of materials used in end products. It should not be used to solely describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual abnormal conditions. However, results of this test method may be used as elements of a fire hazard assessment which takes into account all of the factors pertinent to a particular end use.

This International Standard may involve hazardous materials, operations, and equipment. It does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

## FIRE HAZARD TESTING –

### Part 10-2: Abnormal heat – Ball pressure test method

#### 1 Scope

This part of IEC 60695 specifies the ball pressure test as a method for evaluating the softening temperature and accelerated material flow under load of polymeric materials and parts of end products in their ability to resist abnormal heat. It is applicable to the materials used in electrotechnical equipment, subassemblies and components, and to solid electrical insulating materials except ceramics.

NOTE The Ball Pressure test method is not appropriate for certain elastomers, foamed materials, and other materials that tend to be soft at room temperature. Product Committees are encouraged to evaluate these materials using other methods such as IEC 60695-10-3.

This basic safety publication is intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its publications. The requirements, test methods or test conditions of this basic safety publication will not apply unless specifically referred to or included in the relevant publications.

#### 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 60216-4-1, *Electrical insulating materials – Thermal endurance properties – Part 4-1: Ageing ovens – Single-chamber ovens*

ISO/IEC 13943:2008, *Fire safety – Vocabulary*

ISO 3290-1, *Rolling bearings – Balls – Part 1: Steel balls*

IEC Guide 104, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC Guide 51, *Safety aspects – Guidelines for inclusion in standards*

ISO 293, *Plastics – Compression moulding of test specimens of thermoplastic materials*

ISO 294 (All Parts), *Plastics – Injection moulding of test specimens of thermoplastic materials*

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