Fire hazard testing - Part 2-13: Glowing/hot-wire based test methods - Glow-wire ignition temperature (GWIT) test method for materials

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60695-2-13:2010 sisaldab Euroopa standardi EN 60695-2-13:2010 ingliskeelset teksti.	This Estonian standard EVS-EN 60695-2-13:2010 consists of the English text of the European standard EN 60695-2-13:2010.
Standard on kinnitatud Eesti Standardikeskuse 31.12.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 31.12.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 10.12.2010.	Date of Availability of the European standard text 10.12.2010.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

ICS 13.220.40, 29.020

EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 60695-2-13

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English version

Fire hazard testing - Part 2-13: Glowing/hot-wire based test methods - Glow-wire ignition temperature (GWIT) test method for materials

(IEC 60695-2-13:2010)

Essais relatifs aux risques du feu - Partie 2-13: Essais au fil incandescent/chauffant - Méthode d'essai de température d'allumabilité au fil incandescent (GWIT) pour matériaux
(CEI 60695-2-13:2010)

Prüfungen zur Beurteilung der Brandgefahr - Teil 2-13: Prüfungen mit dem Glühdraht - Prüfungen mit dem Glühdraht zur Entzündbarkeit (GWIT) von Werkstoffen
(IEC 60695-2-13:2010)

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 60695-2-13:2010 E

Foreword

The text of document 89/1018/FDIS, future edition 2 of IEC 60695-2-13, prepared by IEC/TC 89, Fire hazard testing, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60695-2-13 on 2010-12-01.

This European Standard supersedes EN 60695-2-13:2001.

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

This standard is to be used in conjunction with EN 60695-2-10.

This EN 60695-2-13:2010 includes the following significant technical changes with respect to EN 60695-2-13:2001:

– modified title;

– addition of an Introduction;

– clarification of Scope;

– expansion of Clause 2: Normative references;

– expansion of Clause 3;

– revision of Clause 4 to alignment with the EN 60695-11 series to introduce guidance on test programs for material variations;

– clarification of Clause 8: Conditioning (now Clause 7);

– deletion of Clause 9: Initial measurement;

– expansion of Clause 10: Test procedures (now Clause 8);

– expansion of Clause 11: Observation and measurement (now Clause 9);

– clarification of Clause 12: Evaluation of test results (now Clause 10);

– expansion of Clause 13: Test report (now Clause 11).

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

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)	2011-09-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-12-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60695-2-13:2010 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 60695-11 series	NOTE	Harmonized in EN 60695-11 series (not modified).

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.

Publication	Year	Title	EN/HD	Year
IEC 60695-1-30	2008	Fire hazard testing - Part 1-30: Guidance for assessing the fire hazard of electrotechnical products - Preselection testing process - General guidelines	EN 60695-1-30	2008
IEC 60695-2-10	2000	Fire hazard testing - Part 2-10: Glowing/hot-wire based test methods - Glow-wire apparatus and common test procedure	EN 60695-2-10	2001
IEC 60695-2-11	2000	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end-products	EN 60695-2-11	2001
IEC 60695-2-12	-	Fire hazard testing - Part 2-12: Glowing/hot-wire based test methods - Glow-wire flammability index (GWFI) test method for materials	EN 60695-2-12S	-
ISO/IEC Guide 51	1999	Safety aspects - Guidelines for their inclusion in standards	-	-
IEC Guide 104	1997	The preparation of safety publications and the use of basic safety publications and group safety publications	-	-
ISO 291	2008	Plastics - Standard atmospheres for conditioning and testing	EN ISO 291	2008
ISO 293	2004	Plastics - Compression moulding of test specimens of thermoplastic materials	EN ISO 293	2005
ISO 294	Series	Plastics - Injection moulding of test specimens of thermoplastic materials	EN ISO 294	Series
ISO 295	2004	Plastics - Compression moulding of test specimens of thermosetting materials	EN ISO 295	2004
ISO 13943	2008	Fire safety - Vocabulary	EN ISO 13943	2010

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INTRODUCTION

In electrotechnical equipment, overheated metal parts can act as ignition sources. In glow-wire tests an electrically heated wire is used to simulate such an ignition source.

IEC 60695-2-10 describes a glow-wire test apparatus and common test procedure, IEC 60695-2-11 describes a glow-wire flammability test for end products, and IEC 60695-2-12 describes a glow-wire flammability index test method for materials.

In the design of any electrotechnical product, the risk of fire and the potential hazards associated with fire 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 of fire 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 risk assessment.

This part of IEC 60695 describes a glow-wire ignition temperature test method for materials. It should be used to measure, describe, and rank the properties of materials in response to heat caused by contact with an electrically heated wire 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 such as a fault current flowing through a wire, overloading of components, and/or bad connections. It should not be used to solely describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors pertinent to a fire hazard assessment of 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 2-13: Glowing/hot-wire based test methods – Glow-wire ignition temperature (GWIT) test method for materials

1 Scope

This part of IEC 60695 specifies the details of the glow-wire test to be applied to test specimens of solid electrical insulating materials or other solid materials for ignitability testing to determine the glow-wire ignition temperature (GWIT).

The GWIT is the temperature which is 25 K (or 30 K) higher than the maximum test temperature, determined during this standardized procedure, at which the tested material

a) does not ignite, or

b) if sustained and continuous flaming combustion does not occur for a time longer than 5 s for any single flame event and the specimen is not totally consumed.

This test is a materials test carried out on a series of standard test specimens. The data obtained, along with data from the glow-wire flammability index (GWFI) test method for materials, IEC 60695-2-12, can then be used in a preselection process in accordance with IEC 60695-1-30 to judge the ability of materials to meet the requirements of IEC 60695-2-11.

NOTE As an outcome of conducting a fire hazard assessment, an appropriate series of preselection flammability and ignition tests may allow a reduction of end product testing.

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 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 60695-1-30:2008, *Fire hazard testing – Part 1.30: Guidance for assessing the fire hazard of electrotechnical products – Preselection testing process – General guidelines*

IEC 60695-2-10:2000, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

IEC 60695-2-11:2000, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products*

IEC 60695-2-12, *Fire hazard testing – Part 2-12: Glowing/hot-wire based test methods – Glow-wire flammability index (GWFI) test method for materials*

IEC Guide 104:1997, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC Guide 51:1999, *Safety aspects – Guidelines for inclusion in standards*

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

ISO 291:2008, *Plastics – Standard atmospheres for conditioning and testing*

ISO 293:2004, *Plastics – Compression moulding of test specimens of thermoplastic materials*

ISO 294 (all parts), *Plastics – Injection moulding of test specimens of thermoplastic materials*

ISO 295:2004, *Plastics – Compression moulding of test specimens of thermosetting materials*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 13943, some of which are reproduced below for the user's convenience, as well as the following apply.

3.1
combustion
exothermic reaction of a substance with an oxidizing agent

NOTE Combustion generally emits fire effluent accompanied by flames and/or glowing.

[ISO/IEC 13943: 2008, definition 4.46]

3.2
flame, noun
rapid, self-sustaining, sub-sonic propagation of combustion in a gaseous medium, usually with emission of light

[ISO/IEC 13943: 2008, definition 4.133]

3.3
flammability
ability of a material or product to burn with a flame under specified conditions

[ISO/IEC 13943: 2008, definition 4.151]

3.4
glowing, noun
luminosity caused by heat

[ISO/IEC 13943:2008, definition 4.168]

3.5
glowing combustion
combustion of a material in the solid phase without flame but with emission of light from the combustion zone

[ISO/IEC 13943:2008, definition 4.169]

3.6
ignitability
ease of ignition
measure of the ease with which a test specimen can be ignited under specified conditions

[ISO/IEC 13943:2008, definition 4.182]