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TECHNICAL SPECIFICATION

colour inside

Fire hazard testing –
Part 2-20: Glowing/hot wire based test methods – Hot-wire ~~coil~~ ignition (HWI) test method test method – Apparatus, verification, test method and guidance

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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FIRE HAZARD TESTING –

Part 2-20: Glowing/hot wire based test methods – Hot-wire ~~coil~~ ignition (HWI) test method – Apparatus, verification, test method and guidance

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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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC TS 60695-2-20:2021. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC TS 60695-2-20 has been prepared by IEC technical committee 89: Fire hazard testing. It is a Technical Specification.

This fourth edition cancels and replaces the third edition published in 2021. This edition constitutes a technical revision.

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

a) Removed all text which was related to drip or dripping, since in this 4th edition only ignition is taken into consideration for determination of the classification level;
b) Title changed: "Hot wire coil test method" is now "Hot wire ignition (HWI) test method".

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
89/1583/DTS	89/1593/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

Part 2 of IEC 60695 consists of the following parts:

Part 2-10: *Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

Part 2-11: *Glowing/hot-wire based test methods – Glow-wire flammability test method for end products*

Part 2-12: *Glowing/hot-wire based test methods – Glow-wire flammability index (GWFI) test method for materials*

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

Part 2-20: *Glowing/hot-wire based test methods – Hot-wire ignition test method – Apparatus, verification, test method and guidance*

Part 2-21: *Glowing/hot-wire based test methods – Fire containment test on finished units*

A list of all parts in the IEC 60695 series, published under the general title *Fire hazard testing*, can be found on the IEC website.

NOTE The following print types are used:

- Terms **in bold** in the text are defined in Clause 3.

Future documents in this series will carry the new general title as cited above. Titles of existing documents in this series will be updated at the time of the next edition.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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, reasonably foreseeable abnormal use, malfunction and/or failure. IEC 60695-1-10 [1][1], together with its companion IEC 60695-1-11 [2], provides guidance on how this is to be accomplished.

The primary aims of IEC 60695-1-10 [1] and IEC 60695-1-11 [2] 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 [1] and IEC 60695-1-11 [2] 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.

The test method provided in this document applies to solid electrical insulating materials which can provide test specimens. It applies to materials for which the test specimen does not deform during preparation, especially during the winding of the test specimen with the heater wire as described in 5.5.

Examples of deformation that render this test method inapplicable include:

a) bowing, in either a transverse or a longitudinal direction, or twisting of the test specimen during the winding of the test specimen with the heater wire, to a degree visible to the eye, or

b) visible indentation of the test specimen by the heater wire.

A~~n informative~~ classification system described in Annex B can be used for the **preselection** of materials.

[1] Numbers in square brackets refer to the bibliography.

FIRE HAZARD TESTING –

Part 2-20: Glowing/hot wire based test methods – Hot-wire ~~coil~~ ignition (HWI) test method – Apparatus, verification, test method and guidance

1 Scope

This part of IEC 60695, which is a technical specification, describes a test method that applies to solid electrical insulating materials of which test specimens can be provided. The test measures the time required to ignite a test specimen when it is affected by heat from an electrically heated wire wound around the test specimen. ~~If the test specimen drips, the time at which this occurs is also recorded.~~

The test method can be used to provide classifications which can be used for quality assurance, the **preselection** of materials of products as described in IEC 60695-1-30, or to verify the required minimum classification of materials used in **end products**.

~~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 are referred to in the text in such a way that some or all of their content constitutes requirements 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, *Fire hazard testing - Part 1-30: Guidance for assessing the fire hazard of electrotechnical products - Preselection testing process - General guidelines*~~

~~IEC 60695-4:2012, *Fire hazard testing - Part 4: Terminology concerning fire tests for electrotechnical products*~~

~~IEC GUIDE 104:2019, *The preparation of safety publications and the use of basic safety publications and group safety publications*~~

~~ISO/IEC Guide 51:2014, *Safety aspects – Guidelines for their inclusion in standards*~~

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

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

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

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

ISO 13943:~~2008~~2017, *Fire safety – Vocabulary*

ISO 16012~~:2004~~, *Plastics – Determination of linear dimensions of test specimens*

~~JIS C 2520:1999, *Wires and rolled wires for electrical heating*~~

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Part 2-20: Glowing/hot wire based test methods – Hot-wire ignition (HWI) test method – Apparatus, verification, test method and guidance

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