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Standards

Irish Standard
I.S. EN 60695-1-40:2014

Fire hazard testing -- Part 1-40: Guidance for assessing the fire hazard of electrotechnical products - Insulating liquids

I.S. EN 60695-1-40:2014

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EUROPEAN STANDARD

EN 60695-1-40

NORME EUROPÉENNE

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April 2014

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English version

**Fire hazard testing -
Part 1-40: Guidance for assessing the fire hazard of electrotechnical
products -
Insulating liquids
(IEC 60695-1-40:2013)**

Essais relatifs aux risques du feu -
Partie 1-40: Guide pour l'évaluation des
risques du feu des produits
électrotechniques -
Liquides isolants
(CEI 60695-1-40:2013)

Prüfungen zur Beurteilung der
Brandgefahr -
Teil 1-40: Anleitung zur Beurteilung der
Brandgefahr von elektrotechnischen
Erzeugnissen -
Isolierflüssigkeit
(IEC 60695-1-40:2013)

This European Standard was approved by CENELEC on 2013-12-24. 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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European Committee for Electrotechnical Standardization
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 89/1191/FDIS, future edition 1 of IEC 60695-1-40, prepared by IEC/TC 89 "Fire hazard testing" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60695-1-40:2014.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-10-25
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-12-24

This European Standard is to be used in conjunction with EN 60695-1-10.

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Endorsement notice

The text of the International Standard IEC 60695-1-40:2013 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:

ISO 2719:2002	NOTE	Harmonised as EN ISO 2719:2002 (not modified).
IEC 61039	NOTE	Harmonised as EN 61039.
IEC 62271-202	NOTE	Harmonised as EN 62271-202.
IEC 60708:2005	NOTE	Harmonised as EN 60708:2005 (not modified).
IEC 60794-1-1:2011	NOTE	Harmonised as EN 60794-1-1:2011 (not modified).
IEC 60836:2005	NOTE	Harmonised as EN 60836:2005 (not modified).
IEC 61099:2010	NOTE	Harmonised as EN 61099:2010 (not modified).
IEC 61144:1992	NOTE	Harmonised as EN 61144:1993 (not modified).
IEC 61197:1993	NOTE	Harmonised as EN 61197:1994 (not modified).
IEC 62271-105:2012	NOTE	Harmonised as EN 62271-105:2012 (not modified).

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 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 60050		International electrotechnical vocabulary		
IEC 60296		Fluids for electrotechnical applications - Unused mineral insulating oils for transformers and switchgear	EN 60296	
IEC 60465		Specification for unused insulating mineral oils for cables with oil ducts	EN 60465	
IEC 60695-1-10		Fire hazard testing - Part 1-10: Guidance for assessing the fire hazard of electrotechnical products - General guidelines	EN 60695-1-10	
IEC 60695-1-11		Fire hazard testing - Part 1-11: Guidance for assessing the fire hazard of electrotechnical products - Fire hazard assessment	EN 60695-1-11	
IEC 60695-4	2012	Fire hazard testing - Part 4: Terminology concerning fire tests for electrotechnical products	EN 60695-4	2012
IEC/TS 60695-5-2		Fire hazard testing - Part 5-2: Corrosion damage effects of fire effluent - Summary and relevance of test methods		
IEC 60695-6-2		Fire hazard testing - Part 6-2: Smoke obscuration - Summary and relevance of test methods	EN 60695-6-2	
IEC 60695-7-2		Fire hazard testing - Part 7-2: Toxicity of fire effluent - Summary and relevance of test methods	EN 60695-7-2	
IEC 60695-8-2		Fire hazard testing - Part 8-2: Heat release - Summary and relevance of test methods	EN 60695-8-2	
IEC/TS 60695-8-3		Fire hazard testing - Part 8-3: Heat release - Heat release of insulating liquids used in electrotechnical products		
IEC 60944		Guide for maintenance of silicone transformer liquids		
IEC 61039		Classification of insulating liquids	EN 61039	
IEC 61203		Synthetic organic esters for electrical purposes - Guide for maintenance of transformer esters in equipment	EN 61203	
ISO 1716		Reaction to fire tests for building products - Determination of the heat of combustion	EN ISO 1716	
ISO 2592		Determination of flash and fire points - Cleveland open cup method	EN ISO 2592	
ISO 13943	2008	Fire safety - Vocabulary	EN ISO 13943	2010

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Edition 1.0 2013-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

BASIC SAFETY PUBLICATION
PUBLICATION FONDAMENTALE DE SÉCURITÉ

Fire hazard testing –
Part 1-40: Guidance for assessing the fire hazard of electrotechnical products –
Insulating liquids

Essais relatifs aux risques du feu –
Partie 1-40: Guide pour l'évaluation des risques du feu des produits
électrotechniques – Liquides isolants



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IEC 60695-1-40

Edition 1.0 2013-11

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BASIC SAFETY PUBLICATION
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Insulating liquids

Essais relatifs aux risques du feu –
Partie 1-40: Guide pour l'évaluation des risques du feu des produits
électrotechniques – Liquides isolants

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIRE HAZARD TESTING –

Part 1-40: Guidance for assessing the fire hazard of electrotechnical products – Insulating liquids

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 60695-1-40 has been prepared by IEC technical committee 89: Fire hazard testing.

This first edition of IEC 60695-1-40 cancels and replaces the first edition of IEC/TS 60695-1-40 published in 2002. It constitutes a technical revision and now has the status of an International Standard.

The main changes with respect to the first edition of IEC/TS 60695-1-40 are the integration of editorial and technical changes throughout the text.

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

FDIS	Report on voting
89/1191/FDIS	89/1200/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 60695 series, under the general title *Fire hazard testing*, can be found on the IEC web site.

This international standard is to be used in conjunction with IEC 60695-1-10.

IEC 60695-1 consists of the following parts:

- Part 1-10: *Guidance for assessing the fire hazard of electrotechnical products – General guidelines*
- Part 1-11: *Guidance for assessing the fire hazard of electrotechnical products – Fire hazard assessment*
- Part 1-12: *Guidance for assessing the fire hazard of electrotechnical products – Fire safety engineering*
- Part 1-20: *Guidance for assessing the fire hazard of electrotechnical products – Ignitability – General guidance*
- Part 1-21: *Guidance for assessing the fire hazard of electrotechnical products – Ignitability – Summary and relevance of test methods*
- Part 1-30: *Guidance for assessing the fire hazard of electrotechnical products – Preselection testing process – General guidelines*
- Part 1-40: *Guidance for assessing the fire hazard of electrotechnical products – Insulating liquids*

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

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

INTRODUCTION

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 even in the event of foreseeable abnormal use, malfunction or failure.

For more than 100 years, insulating liquids based on mineral oil have been used for the insulating and cooling of electrical transformers and some other types of electrotechnical equipment.

During the last 70 years, synthetic insulating liquids have been developed and used in specific electrotechnical applications for which their properties are particularly suitable. However, for technical and economic reasons, highly refined mineral oil continues to be the most widely used insulating liquid for use in transformers, the major end use application. Their safe installation is covered by local, national and international regulations.

The fire safety record of electrotechnical equipment containing insulating liquids is good, for both mineral oil and synthetic liquids. In recent years improvements in design and protective measures against fire have reduced the fire hazard for electrotechnical equipment containing mineral oil. However, as for all forms of electrotechnical equipment, the objective should be to reduce the likelihood of fire even in the event of foreseeable abnormal use.

The practical aim is to prevent ignition, but if ignition occurs, to control the fire, preferably within the enclosure of the electrotechnical equipment.

FIRE HAZARD TESTING –

Part 1-40: Guidance for assessing the fire hazard of electrotechnical products – Insulating liquids

1 Scope

This international standard provides guidance on the minimization of fire hazard arising from the use of electrical insulating liquids, with respect to:

- a) electrotechnical equipment and systems,
- b) people, building structures and their contents.

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 [1]¹ and ISO/IEC Guide 51 [2]. It is not intended for use by manufacturers or certification bodies.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its 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 60050, *International electrotechnical vocabulary*

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

IEC 60465, *Specification for unused insulating mineral oils for cables with oil ducts*

IEC 60695-1-10, *Fire hazard testing – Part 1-10: Guidance for assessing the fire hazard of electrotechnical products – General guidelines*

IEC 60695-1-11, *Fire hazard testing – Part 1-11: Guidance for assessing the fire hazard of electrotechnical products – Fire hazard assessment*

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

IEC 60695-6-2, *Fire hazard testing – Part 6-2: Smoke obscuration – Summary and relevance of test methods*

IEC 60695-7-2, *Fire hazard testing – Part 7-2: Toxicity of fire effluent – Summary and relevance of test methods*

¹ Numbers in square brackets refer to the Bibliography.

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