ICS 13.220.40, 29.020 SLOVENSKÁ TECHNICKÁ NORMA November 2014

STN	**Skúšanie požiarneho nebezpečenstva. Časť 1-40: Návod na posudzovanie požiarneho nebezpečenstva elektrotechnických výrobkov. Izolačné kvapaliny.**	**STN EN 60695-1-40** 34 5630

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/14

Obsahuje: EN 60695-1-40:2014, IEC 60695-1-40:2013

119592

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60695-1-40

April 2014

ICS 13.220.40; 29.020

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.

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 CEN-CENELEC Management Centre has the same status as the official versions.

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

CENELEC

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

Ref. No. EN 60695-1-40:2014 E

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.

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.

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.

Publication	Year	Title	EN/HD	Year
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

IEC 60695-1-40

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

IEC 60695-1-40:2013

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

Useful links:

IEC publications search - www.iec.ch/searchpub

The advanced search enables you to find IEC publications by a variety of criteria (reference number, text, technical committee,…).
It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available on-line and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary (IEV) on-line.

Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Liens utiles:

Recherche de publications CEI - www.iec.ch/searchpub

La recherche avancée vous permet de trouver des publications CEI en utilisant différents critères (numéro de référence, texte, comité d'études,…).
Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

Just Published CEI - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications de la CEI. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (VEI) en ligne.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.

IEC 60695-1-40

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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

PRICE CODE
CODE PRIX V

ICS 13.220.40; 29.020

ISBN 978-2-8322-1170-0

CONTENTS

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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.

IEC 60695-8-2, *Fire hazard testing – Part 8-2: Heat release – Summary and relevance of test methods*

IEC 60944, *Guide for the maintenance of silicone transformer liquids*

IEC 61039, *Classification of insulating liquids*

IEC 61203, *Synthetic organic esters for electrical purposes – Guide for maintenance of transformer esters in equipment*

IEC/TS 60695-5-2, *Fire hazard testing – Part 5-2: Corrosion damage effects of fire effluent – Summary and relevance of test methods*

IEC/TS 60695-8-3, *Fire hazard testing – Part 8-3: Heat release – Heat release of insulating liquids used in electrotechnical products*

ISO 1716, *Reaction to fire tests for products – Determination of the gross heat of combustion (calorific value)*

ISO 2592, *Determination of flash and fire points – Cleveland open cup method*

ISO 13943:2008, *Fire safety – Vocabulary*