



NSAI
Standards

Irish Standard
I.S. EN 61249-4-18:2013

Materials for printed boards and other interconnecting structures -- Part 4-18: Sectional specification set for prepreg materials, unclad (for the manufacture of multilayer boards) - High performance epoxide woven E-glass prepreg of defined flammability (vertical burning test) for lead-free assembly

I.S. EN 61249-4-18:2013

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN 61249-4-18:2013

Published:

2013-12-13

This document was published under the authority of the NSAI and comes into effect on:

2013-12-24

ICS number:

31.180

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61249-4-18

December 2013

ICS 31.180

English version

**Materials for printed boards and other interconnecting structures -
Part 4-18: Sectional specification set for prepreg materials, unclad (for the
manufacture of multilayer boards) -
High performance epoxide woven E-glass prepreg of defined flammability
(vertical burning test) for lead-free assembly
(IEC 61249-4-18:2013)**

Matériaux pour circuits imprimés et autres
structures d'interconnexion -
Partie 4-18: Série de spécifications
intermédiaires pour matériaux
préimprégnés, non plaqués (pour la
fabrication des cartes multicouches) -
Tissu de verre époxyde préimprégné de
type E à haute performance,
d'inflammabilité définie (essai de
combustion verticale), pour les
assemblages sans plomb
(CEI 61249-4-18:2013)

Materialien für Leiterplatten und andere
Verbindungsstrukturen -
Teil 4-18: Rahmenspezifikation für
unkaschierte Prepreg-Materialien (zur
Herstellung von Mehrlagenleiterplatten) -
Hochwertige mit E-Glasgewebe verstärkte
Epoxidharz-Prepregs mit definierter
Brennbarkeit (Brennprüfung mit vertikaler
Prüflingslage) für bleifreie
Bestückungstechnik
(IEC 61249-4-18:2013)

This European Standard was approved by CENELEC on 2013-12-09. 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

Foreword

The text of document 91/1125/FDIS, future edition 1 of IEC 61249-4-18, prepared by IEC TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61249-4-18:2013.

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) 2014-09-09
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-12-09

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 61249-4-18:2013 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:

- | | | |
|----------------|------|---|
| IEC 60194:2006 | NOTE | Harmonized as EN 60194:2006 (not modified). |
| IEC 62326-4 | NOTE | Harmonized as EN 62326-4. |

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 61189-2	2006	Test methods for electrical materials, printed boards and other interconnection structures and assemblies - Part 2: Test methods for materials for interconnection structures	EN 61189-2	2006
IEC 61249-2-39	2012	Materials for printed boards and other interconnecting structures - Part 2-39: Reinforced base materials clad and unclad - High performance epoxide and non-epoxide, woven E-glass laminated sheets of defined flammability (vertical burning test), copper-clad for lead-free assembly	EN 61249-2-39	2013
IEC/PAS 61249-6-3	2011	Specification for finished fabric woven from "E" glass for printed boards	-	-
ISO 9000	2005	Quality management systems - Fundamentals and vocabulary	EN ISO 9000	2005
ISO 11014	2009	Safety data sheet for chemical products - Content and order of sections	-	-
ISO 14001	2004	Environmental management systems - Requirements with guidance for use	EN ISO 14001	2004

This page is intentionally left blank



IEC 61249-4-18

Edition 1.0 2013-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Materials for printed boards and other interconnecting structures –
Part 4-18: Sectional specification set for prepreg materials, unclad (for the
manufacture of multilayer boards) – High performance epoxide woven E-glass
prepreg of defined flammability (vertical burning test) for lead-free assembly**

**Matériaux pour circuits imprimés et autres structures d'interconnexion –
Partie 4-18: Série de spécifications intermédiaires pour matériaux préimprégnés,
non plaqués (pour la fabrication des cartes multicouches) – Tissu de verre
époxyde préimprégné de type E à haute performance, d'inflammabilité définie
(essai de combustion verticale), pour les assemblages sans plomb**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2013 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.

Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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 61249-4-18

Edition 1.0 2013-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Materials for printed boards and other interconnecting structures –
Part 4-18: Sectional specification set for prepreg materials, unclad (for the
manufacture of multilayer boards) – High performance epoxide woven E-glass
prepreg of defined flammability (vertical burning test) for lead-free assembly**

**Matériaux pour circuits imprimés et autres structures d'interconnexion –
Partie 4-18: Série de spécifications intermédiaires pour matériaux préimprégnés,
non plaqués (pour la fabrication des cartes multicouches) – Tissu de verre
époxyde préimprégné de type E à haute performance, d'inflammabilité définie
(essai de combustion verticale), pour les assemblages sans plomb**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

N

ICS 31.180

ISBN 978-2-8322-1168-7

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	4
1 Scope.....	6
2 Normative references	6
3 Materials and construction.....	6
3.1 General.....	6
3.2 Reinforcement	7
3.3 Resin system	7
4 Properties.....	7
4.1 Properties related to the appearance of the prepreg.....	7
4.1.1 General	7
4.1.2 Dewetted areas (fish eyes)	7
4.1.3 Broken filaments.....	7
4.1.4 Distortion	7
4.1.5 Creases.....	7
4.1.6 Edge conditions	8
4.2 Properties related to B-stage prepreg	8
4.2.1 General	8
4.2.2 Resin content	8
4.2.3 Treated weight.....	8
4.2.4 Resin flow.....	8
4.2.5 Scaled flow thickness	9
4.2.6 Melting viscosity	9
4.2.7 Gel time.....	9
4.2.8 Volatile content.....	9
4.3 Properties related to prepreg after curing.....	9
4.3.1 Electric strength.....	9
4.3.2 Flammability	9
4.3.3 Relative permittivity and dissipation factor	10
4.3.4 Cured thickness.....	10
4.3.5 Glass transition temperature (T_g).....	10
4.3.6 Decomposition temperature (T_d).....	10
4.3.7 Time to delamination	10
4.3.8 Z-axis expansion.....	11
5 Delivery form	11
5.1 General.....	11
5.2 Rolls	11
5.3 Sheets	11
5.4 Cut panels	11
6 Quality assurance.....	11
6.1 Quality system	11
6.2 Responsibility for inspection.....	12
6.3 Qualification inspection	12
6.4 Quality conformance inspection	12
6.5 Certificate of conformance	12
6.6 Safety data sheet.....	12

7	Packaging and marking	12
8	Shelf life	13
9	Ordering information	13
	Bibliography.....	14
	Table 1 – Flammability, vertical burning test	10
	Table 2 – Decomposition temperature requirements	10
	Table 3 – Time to delamination requirements.....	11
	Table 4 – Z-axis expansion requirements	11

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**MATERIALS FOR PRINTED BOARDS
AND OTHER INTERCONNECTING STRUCTURES –**
**Part 4-18: Sectional specification set for prepreg materials,
unclad (for the manufacture of multilayer boards) –
High performance epoxide woven E-glass prepreg of defined
flammability (vertical burning test) for lead-free assembly**

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 61249-4-18 has been prepared by IEC technical committee 91: Electronics assembly technology.

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

FDIS	Report on voting
91/1125/FDIS	91/1147/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 parts of the IEC 61249 series, under the general title *Materials for printed boards and other interconnecting structures*, can be found on the IEC website.

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.

MATERIALS FOR PRINTED BOARDS AND OTHER INTERCONNECTING STRUCTURES –

Part 4-18: Sectional specification set for prepreg materials, unclad (for the manufacture of multilayer boards) – High performance epoxide woven E-glass prepreg of defined flammability (vertical burning test) for lead-free assembly

1 Scope

This part of IEC 61249 gives requirements for properties of prepreg that is mainly intended to be used as bonding sheets in connection with laminates according to IEC 61249-2-39 when manufacturing multilayer boards according to IEC 62326-4. Multilayer boards comprised of these materials are suitable for lead-free assembly processes. This material may be also used to bond other types of laminates.

Prepreg according to this standard is of defined flammability (vertical burning test). The flammability rating on fully cured prepreg is achieved through the use of brominated fire retardants contained as an integral part of the polymeric structure. After curing of the prepreg according to the supplier's instructions, the glass transition temperature is defined to be 170 °C minimum.

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 61189-2:2006, *Test methods for electrical materials, interconnection structures and assemblies – Part 2: Test methods for materials for interconnection structures*

IEC 61249-2-39:2012, *Materials for printed boards and other interconnecting structures – Part 2-39: Reinforced base materials clad and unclad – High performance epoxide and non-epoxide, woven E-glass laminate sheets of defined flammability (vertical burning test), copper-clad for lead-free assembly*

IEC/PAS 61249-6-3:2011, *Specification for finished fabric woven from "E" glass for printed boards*

ISO 9000:2005, *Quality management systems – Fundamentals and vocabulary*

ISO 11014:2009, *Safety data sheet for chemical products – Content and order of sections*

ISO 14001:2004, *Environmental management systems – Requirements with guidance for use*

3 Materials and construction

3.1 General

The prepreg consists of a reinforcing E-glass fabric which is impregnated with high performance epoxide resin, partially cured to the B-stage. The flammability rating is achieved

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-