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BSI Standards Publication

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

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National foreword

This British Standard is the UK implementation of EN 61249-2-39:2013. It is identical to IEC 61249-2-39:2012.

The UK participation in its preparation was entrusted to Technical Committee EPL/501, Electronic assembly technology & Printed Electronics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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English version

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 61249-2-39:2012)

Matériaux pour circuits imprimés et autres structures d'interconnexion -
Partie 2-39: Matériaux de base renforcés, plaqués et non plaqués -
Feuilles stratifiées en tissu de verre de type E époxyde et non époxyde à haute performance, plaquées cuivre, d'inflammabilité définie (essai de combustion verticale), pour les assemblages sans plomb
(CEI 61249-2-39:2012)

Materialien für Leiterplatten und andere Verbindungsstrukturen -
Teil 2-39: Kaschierte und unkaschierte verstärkte Basismaterialien - Kupferkaschierte mit E-Glasgewebe verstärkte Laminattafeln hochwertiger Qualität auf der Basis von Epoxidharz und Nicht-Epoxidharz mit definierter Brennbarkeit (Brennprüfung mit vertikaler Prüflingslage) für bleifreie Bestückungstechnik
(IEC 61249-2-39:2012)

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Foreword

The text of document 91/1052/FDIS, future edition 1 of IEC 61249-2-39, prepared by IEC TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61249-2-39:2013.

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) 2013-10-03
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2016-01-03

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

NOTE Harmonized as EN ISO 14001:2004 (not modified).

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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. Fo

		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 61249-5-1	1995	Materials for interconnection structures - Part 5: Sectional specification set for conductive foils and films with or without coatings - Section 1: Copper foils (for the manufacture of copper-clad base materials)	EN 61249-5-1	1996
IEC/PAS 61249-6-3	2011	Specification for finished fabric woven from "E" glass for printed boards	-	-
ISO 11014	2009	Safety data sheet for chemical products - Content and order of sections	-	-

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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

1 Scope

This part of IEC 61249 specifies requirements for properties of modified brominated epoxide woven E-glass laminated sheet of a thickness 0,05 mm up to 3,2 mm, of defined flammability (vertical burning test), copper-clad. The glass transition temperature is defined to be 170 °C minimum.

Its flame resistance is defined in terms of the flammability requirements of 7.3.

Some property requirements may have several classes of performance. The class desired should be specified on the purchase order, otherwise the default class of material will be supplied.

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, printed boards and other interconnection structures and assemblies – Part 2: Test methods for materials and other interconnection structures*

IEC 61249-5-1:1995, *Materials for interconnection structures – Part 5: Sectional specification set for conductive foils and films with or without coatings – Section 1: Copper foils (for the manufacture of copper-clad base materials)*

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

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

3 Materials and construction

3.1 General

The sheet consists of an insulating base with metal-foil bonded to one side or both.

3.2 Resin system

A blend of majority di-functional, multifunctional epoxide and non-epoxide, woven E-glass laminate with a glass transition temperature of 170 °C minimum. The flammability rating is achieved through the use of bromine reacted into the polymer. Inorganic fillers may be used

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Contrast agents may be added to enhance processing such as automated optical inspection (AOI).

The maximum total halogens contained in resin plus reinforcement matrix is 1 500 ppm with a maximum chlorine of 900 ppm and maximum bromine of 900 ppm.

Its flame resistance is defined in terms of the flammability requirements of 7.3.

3.3 Metal foil

Copper, as specified in IEC 61249-5-1, copper foil (for the manufacture of copper-clad materials). The preferred foils are electrodeposited of defined ductility.

3.4 Reinforcement

Woven E-glass as specified in IEC/PAS 61249-6-3, woven E-glass fabric (for the manufacture of prepreg and copper clad materials).

4 Internal marking

Not specified.

5 Electrical properties

The electrical property requirements are shown in Table 1.

Table 1 – Electrical properties

Property	Test method IEC 61189-2	Requirement
Resistance of foil	2E12	As specified in IEC 61249-5-1
Surface resistance after damp heat while in the humidity chamber (optional)	2E03	≥10 000 MΩ
Surface resistance after damp heat and recovery	2E03	≥50 000 MΩ
Volume resistivity after damp heat while in the humidity chamber (optional)	2E04	≥5 000 MΩm
Volume resistivity after damp heat and recovery	2E04	≥10 000 MΩm
Relative permittivity after damp heat and recovery (1 MHz)	2E10	≤5,4
Dissipation factor after damp heat and recovery (1 MHz)	2E10	≤0,035
Electric strength (only for material thickness less than 0,5 mm)	2E11	≥30 kV/mm
Arc resistance	2E14	≥60 s
Dielectric breakdown (only for material thicknesses ≥0,5 mm)	2E15	≥40 kV
Surface resistance at 125 °C	2E07	≥1 000 MΩ
Volume resistivity at 125 °C	2E07	≥1 000 MΩm

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