

Materials for printed boards and other interconnecting structures —

Part 2-21: Reinforced base materials, clad and unclad — Non-halogenated epoxide woven E-glass reinforced laminated sheets of defined flammability (vertical burning test), copper-clad

The European Standard EN 61249-2-21:2003 has the status of a British Standard

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee EPL/501, Electronic assembly technology, which has the responsibility to:

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Summary of pages

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Part 2-21: Reinforced base materials, clad and unclad –
Non-halogenated epoxide woven E-glass
reinforced laminated sheets of defined flammability
(vertical burning test), copper-clad
(IEC 61249-2-21:2003)

Matériaux pour circuits imprimés et autres structures d'interconnexion
Partie 2-21: Matériaux de base renforcés plaqués et non plaqués –
Feuilles stratifiées renforcées en tissu de verre de type E époxyde non halogéné, d'inflammabilité définie (essai de combustion verticale) plaquées cuivre
(CEI 61249-2-21:2003)

Materialien für Verbindungsstrukturen
Teil 2-21: Kaschierte und unkaschierte verstärkte Basismaterialien –
Kupferkaschierte mit E-Glasgewebe verstärkte Laminattafeln auf der Basis von halogenfreiem Epoxidharz mit definierter Brennbarkeit (Brennprüfung mit vertikaler Prüflingslage)
(IEC 61249-2-21:2003)

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 91/409/FDIS, future edition 1 of IEC 61249-2-21, prepared by IEC TC 91, Electronics assembly technology, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61249-2-21 on 2003-12-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
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- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2006-12-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A, B and C are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61249-2-21:2003 was approved by CENELEC as a European Standard without any modification.

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MATERIALS FOR PRINTED BOARDS AND OTHER INTERCONNECTING STRUCTURES –

Part 2-21: Reinforced base materials, clad and unclad – Non-halogenated epoxide woven E-glass reinforced laminated sheets of defined flammability (vertical burning test), copper-clad

1 Scope

This part of IEC 61249 gives requirements for properties of non-halogenated epoxide woven E-glass reinforced laminated sheets of defined flammability (vertical burning test), copper-clad in thicknesses 0,05 mm up to 3,2 mm. The flammability rating is achieved through the use of non-halogenated inorganic and/or organic compounds acting as fire retardants. These fire retardants are contained as part of the polymeric structure or in addition to it. The glass transition temperature is defined to be 120 °C minimum.

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

2 Normative references

The following referenced documents are indispensable for the application 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 61189-2:1997, *Test methods for electrical materials, interconnection structures and assemblies – Part 2: Test method for 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 foil (for the manufacture of copper-clad base materials)*

ISO 9000:2000, *Quality management systems – Fundamentals and vocabulary*

ISO 11014-1:1994, *Safety data sheet for chemical products – Part 1: Content and order of sections*

ISO 14001:1996, *Environmental management systems – Specification with guidance for use*

3 Materials and construction

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

3.1 Resin system

Non-halogenated epoxide with a glass transition temperature of 120 °C minimum. The maximum total halogens contained in the resin plus reinforcement matrix is 1 500 ppm with a maximum chlorine of 900 ppm and maximum bromine being 900 ppm.

Contrast agents may be added to enhance processing such as automated optical inspection (AOI). Its flame resistance is defined in terms of the flammability requirements of 7.3.

3.2 Reinforcement

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

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 electro-deposited of defined ductility.

4 Internal marking

Not specified.

5 Electrical properties

The requirements for the electrical properties are shown in Table 1.

Table 1 – Electrical properties requirements

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	$\geq 10\,000\text{ M}\Omega$
Surface resistance after damp heat and recovery	2E03	$\geq 50\,000\text{ M}\Omega$
Volume resistivity after damp heat while in the humidity chamber (optional)	2E04	$\geq 5\,000\text{ M}\Omega\text{m}$
Volume resistivity after damp heat and recovery	2E04	$\geq 10\,000\text{ M}\Omega\text{m}$
Relative permittivity after damp heat and recovery at 1 MHz	2E10	$\leq 5,4$
Dissipation factor after damp heat and recovery at 1 MHz	2E10	$\leq 0,035$
Electric strength (only for material thicknesses $<0,5\text{ mm}$)	2E11	$\geq 30\text{ kV/mm}$
Arc resistance	2E14	$\geq 60\text{ s}$
Dielectric breakdown (only for material thicknesses $\geq 0,5\text{ mm}$)	2E15	$\geq 40\text{ kV}$
Surface resistance at 125 °C	2E07	$\geq 1\,000\text{ M}\Omega$
Volume resistivity at 125 °C	2E07	$\geq 1\,000\text{ M}\Omega\text{m}$