SLOVENSKI STANDARD
SIST EN 61249-2-13:2001

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Materials for printed boards and other interconnecting structures - Part 2-13: Sectional specification set for reinforced base materials, clad and unclad - Cyanate ester non-woven aramid laminate of defined flammability, copper clad

Materials for printed boards and other interconnecting structures -- Part 2-13: Sectional specification set for reinforced base materials, clad and unclad - Cyanate ester non-woven aramid laminate of defined flammability, copper clad

Materialien für Leiterplatten und andere Verbindungsstrukturen -- Teil 2-13: Rahmenspezifikation für verstärkte, kaschierte und unkaschierte Basismaterialien - Aramidwirrfaser-verstärktes Cyanatester-Laminat definierter Brennbarkeit, kupferkaschiert

Matériaux pour circuits imprimés et autres structures d'interconnexion -- Partie 2-13: Collection de spécifications intermédiaires pour les matériaux de base renforcés, recouverts ou non de feuille conductrice - Stratifié à base d'aramide non tissé collé avec de la résine cyanate ester, recouvert de cuivre, d'inflammabilité définie

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Materials for printed boards and other interconnecting structures Part 2-13: Sectional specification set for reinforced base materials, clad and unclad - Cyanate ester non-woven aramid laminate of defined flammability, copper clad (IEC 61249-2-13:1999)

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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 52/791/FDIS, future edition 1 of IEC 61249-2-13, prepared by IEC TC 52, Printed circuits, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61249-2-13 on 1999-04-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2000-01-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2002-04-01

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 annex A is informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61249-2-13:1999 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 61189-2	1997	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 + corr. August	1997 1997
IEC 61249-5-1	1995	Materials for interconnection structures Part 5: Sectional specification set for conductive foils and films with and without coatings Section 1: Copper foils (for the manufacture of copper-clad base materials)	EN 61249-5-1	1996

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Materials for printed boards and other interconnecting structures –

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Sectional specification set for reinforced base materials, clad and unclad – Cyanate ester non-woven aramid laminate of defined flammability, copper-clad

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FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.

3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.

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6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61249-2-13 has been prepared by IEC technical committee 52: Printed circuits.

This bilingual version (2001-05) replaces the English version.

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

FDIS	Report on voting
52/791/FDIS	52/802/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 3.

Annex A is for information only.

The committee has decided that the contents of this publication will remain unchanged until 2005. 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 2-13: Sectional specification set for reinforced base materials, clad and unclad – Cyanate ester non-woven aramid laminate of defined flammability, copper-clad

1 Scope

This part of IEC 61249 gives requirements for properties of cyanate ester non-woven aramid copper-clad laminate of defined flammability, in thicknesses of 0,05 mm up to 6,4 mm.

NOTE To designate this material, the reference: 61249-2-13-FV1 0-IEC-CE-AP-Cu may be used; if there is no risk of confusion, the type designation may be abbreviated to read IEC-61249-2-13-FV1.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61249. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61249 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 61189-2:1997, *Test methods for electrical materials, interconnection structures and assemblies – Part 2: Test methods for materials for interconnection structures*

IEC 61249-5-1:1995, *Materials for printed boards and interconnecting 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)*

3 Materials and construction

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

3.1 Insulating base

Cyanate ester resin bonded non-woven aramid laminate. Its flame resistance is defined in terms of the flammability requirements of 7.3.

3.2 Metal foil

Copper as specified in IEC 61249-5-1. The preferred foils are type E1 (standard electro-deposited copper) of standard ductility.

4 Internal marking

Not specified.

5 Electrical properties

Table 1 – Electrical properties

Property	Test method (IEC 61189-2)	Requirements
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 min.
Surface resistance after damp heat and recovery	2E03	100 000 MΩ min.
Volume resistivity after damp heat while in the humidity chamber (optional)	2E04	1 000 MΩm min.
Volume resistivity after damp heat and recovery	2E04	10 000 MΩm min.
Surface corrosion	2E08	No visible corrosion products in the gap
Corrosion at the edge	2E13	Positive pole: not worse than A/B Negative pole: not worse than 1,4
Relative permittivity after damp heat and recovery	2E10	The average value shall not exceed 4,0
Dielectric dissipation factor after damp heat and recovery	2E10	The average value shall not exceed 0,03
Electrical strength (optional) material thickness not greater than 0,8 mm	2E11	30 kV/mm min.
Surface resistance at 200 °C	2E07	100 000 MΩ min.
Volume resistivity at 200 °C	2E07	10 000 MΩm min.

6 Non-electrical properties of the copper-clad laminate

6.1 Appearance of the copper-clad face

6.1.1 Normal surface appearance

The copper-clad face shall be substantially free from blisters, wrinkles, pin-holes, deep scratches, pits and resin. Any discoloration or contamination shall be readily removable with a hydrochloric acid solution of density 1,02 g/cm^2 with a suitable organic solvent.

6.1.2 Qualified surface appearance (optional)

If a surface of high quality is essential for precious metal plating or fine line etching and is ordered by the purchaser, the following requirements shall apply in addition to those of 6.1.1 when inspected in accordance with 2M18 of IEC 61189-2.

The surface appearance of the copper-clad face shall be such as not to conceal imperfections.

The surface of the copper foil shall be free from scratches of depth greater than 10 µm or 1/5 of the nominal thickness of the copper foil, whichever is lower.