SLOVENSKI STANDARD
oSIST prEN IEC 61249-2-53:2024

01-december-2024

Materiali za plošče tiskanih vezij in druge povezovalne strukture - 2-53. del: Pokovinjeni in nepokovinjeni ojačeni osnovni materiali

Materials for printed boards and other interconnecting structures - Part 2-53: Reinforced base materials clad and unclad - PTFE unfilled laminate sheets of defined flammability (vertical burning test), copper-clad

Matériaux pour circuits imprimés et autres structures d'interconnexion - Partie 2-53: Matériaux de base renforcés, métallisés et non métallisés - Feuilles stratifiées non chargées en PTFE d'inflammabilité définie (essai de combustion verticale), plaquées cuivre

Ta slovenski standard je istoveten z: **prEN IEC 61249-2-53:2024**

ICS:

31.180	Tiskana vezja (TIV) in tiskane plošče / Printed circuits and boards

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COMMITTEE DRAFT FOR VOTE (CDV)

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IEC TC 91 : ELECTRONICS ASSEMBLY TECHNOLOGY	
SECRETARIAT:	SECRETARY:
Japan	Mr Osamu IKEDA
OF INTEREST TO THE FOLLOWING COMMITTEES:	HORIZONTAL FUNCTION(S):
ASPECTS CONCERNED:	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
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TITLE:

Materials for printed boards and other interconnecting structures - Part 2-53: Reinforced base materials clad and unclad - PTFE unfilled laminate sheets of defined flammability (vertical burning test), copper-clad

PROPOSED STABILITY DATE: 2031

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MATERIALS FOR PRINTED BOARDS AND OTHER INTERCONNECTING STRUCTURES –

Part 2-53: Reinforced base materials clad and unclad – PTFE unfilled laminate sheets of defined flammability (vertical burning test), copper-clad

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International Standard IEC 61249-2-53 has been prepared by IEC technical committee 91, Electronics assembly technology.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

The National Committees are requested to note that for this document the stability date is 2031.

THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE DELETED AT THE PUBLICATION STAGE.

MATERIALS FOR PRINTED BOARDS AND OTHER INTERCONNECTING STRUCTURES –

Part 2-53: Reinforced base materials clad and unclad - PTFE unfilled laminate sheets of defined flammability (vertical burning test), copper-clad

1 Scope

This part of IEC 61249 specifies requirements for properties of PTFE unfilled reinforced laminated sheet of a thickness 0,05 mm up to 10,0 mm, of defined flammability (vertical burning test), copper-clad.

This part of IEC 61249 is applicable to the design, manufacture, use of PTFE unfilled reinforced laminated sheet of defined flammability (vertical burning test), copper-clad.

Its flame resistance is defined in terms of the flammability requirements of 8.3.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 61189-2:2006, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 2: Test methods for materials for interconnection structures*

IEC 61189-2-721:2015, *Test methods for electrical materials, printed board and other interconnection structures and assemblies - Part 2-721: Test methods for materials for interconnection structures – Measurement of relative permittivity and loss tangent for copper clad laminate at microwave frequency using split post dielectric resonator*

IEC 61189-2-803:20XX, *Test methods for electrical materials, printed board and other interconnection structures and assemblies - Part 2-803: Test methods for materials for interconnection structures - Test methods for Z-Axis Expansion of base materials and printed board*

IEC 61189-2-807:2021, *Test methods for electrical materials, printed board and other interconnection structures and assemblies - Part 2-807: Test methods for materials for interconnection structures – Decomposition temperature (Td) using TGA*

IEC 61189-2-809:20XX, *Test methods for electrical materials, printed board and other interconnection structures and assemblies – Part 2-809: Test methods for materials for interconnection structures - X/Y Coefficient of Thermal Expansion Test (CTE) for Thick Base Materials by TMA*

IEC 61249-5-1, 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*

IPC TM-650 TM 2.5.5.5, *Stripline Test for Permittivity and Loss Tangent (Dielectric Constant and Dissipation Factor) at X-Band*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Construction and Materials

4.1 Construction

The sheet consists of an insulating base make of PTFE as the primary resin with metal-foil bonded to one side or both.

4.2 Resin system

PTFE resin or modified PTFE as the primary resin, and have no filler.

4.3 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.

4.4 Reinforcement

Woven E-glass as specified in IEC/PAS 61249-6-3.

5 Internal marking

AABUS (As agreed upon by user and supplier).

6 Electrical properties

The electrical properties requirements are shown in Table 1.

Table 1 – Electrical properties

Property	Test method	Units	Requirement
Surface resistivity after damp heat while in the humidity chamber	IEC 61189-2 2E04	MΩ	≥10 000
Volume resistivity after damp heat while in the humidity chamber	IEC 61189-2 2E04	MΩ • m	≥5 000
Surface resistivity after E-24/125 while in the chamber	IEC 61189-2 2E04	MΩ	≥1 000
Volume resistivity after E-24/125 while in the chamber	IEC 61189-2 2E04	MΩ • m	≥1 000
Relative permittivity as received (10 GHz)[a]	IPC TM-650 TM 2.5.5.5	-	Type A：≤2,75 Type B：>2,75 ≤4,00 Nominal value shall be AABUS
Relative permittivity as received (10 GHz) [a]	IEC 61189-2-721	-	AABUS
Dissipation factor as received (10 GHz) [a]	IEC 61189-2-721	-	Type A：⩽0.0025 Type B：＞0.0025, ⩽ 0.005

			Nominal value shall be AABUS
Thermal coefficient of relative permittivity (10 GHz, -55 °C～85 °C)	IEC 61189-2-721	10^{-6}/°C	AABUS
Electric strength (only for material thickness <0,5 mm)	IEC 61189-2 2E02	kV/mm	≥20
Arc resistance	IEC 61189-2 2E14	s	≥60
Dielectric breakdown (only for material thicknesses ≥0,5 mm)	IEC 61189-2 2E15	kV	≥35

[a] The tolerance of relative permittivity around that nominal can be chosen as follows, 1: ± 0,02 2: ± 0,04 3: ± 0,05 4: ± 0,25 5: ± 0,50 6: AABUS.

7 Non-electrical properties of the copper-clad laminate

7.1 Appearance of the copper-clad sheet

7.1.1 General

Appearance of the copper-clad sheet shall be inspected in accordance with IEC 61189-2 method 2M18.

The copper-clad face shall be substantially free from pinhole and resin spots, and free from defects that may have an impact on the material´s fitness for use for the intended purpose.

For the following specific defects the requirements given shall apply.

7.1.2 Indentations (pits and dents)

The size of an indentation, usually the length, shall be determined and given a point value to be used as measure of the quality, see Table 2.

Table 2 – Indentations

Size mm	Point value for each indentation
≥0,13 ≤0,25	1
>0,25 ≤0,50	2
>0,50 ≤0,75	4
>0,75 ≤1,00	7
>1,00	30

The total point count for any 300 mm × 300 mm area shall be calculated to determine the class of the material.

Class A 29 maximum

Class B 17 maximum Longest Dimensions ≤500 µm

Class C 5 maximum Longest Dimensions ≤380 µm

Class D 0

Class X To be agreed upon by user and supplier

The required class of material shall be specified in the purchase order. Class A applies unless otherwise specified.