

SLOVENSKI STANDARD
SIST EN 61189-3:2001/A1:2001
01-marec-2001

Test methods for electrical materials, printed boards and other interconnection structures and assemblies - Part 3: Test methods for interconnection structures (printed boards)

Test methods for electrical materials, printed boards and other interconnection structures and assemblies -- Part 3: Test methods for interconnection structures (printed boards)

Prüfverfahren für Elektromaterialien, Leiterplatten und andere Verbindungsstrukturen und Baugruppen -- Teil 3: Prüfverfahren für Verbindungsstrukturen (Leiterplatten)

Méthodes d'essai pour les matériaux électriques, les cartes imprimées et autres structures d'interconnexion et ensembles -- Partie 3: Méthodes d'essai des structures d'interconnexion (cartes imprimées)

Ta slovenski standard je istoveten z: EN 61189-3:1997/A1:1999

ICS:

31.180	Tiskana vezja (TIV) in tiskane plošče	Printed circuits and boards
31.190	Sestavljeni elektronski elementi	Electronic component assemblies

SIST EN 61189-3:2001/A1:2001 **en**

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[SIST EN 61189-3:2001/A1:2001](https://standards.iteh.ai/catalog/standards/sist/612ba806-7c78-4a4c-a1ca-c2fabf68e2ac/sist-en-61189-3-2001-a1-2001)

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61189-3/A1

September 1999

ICS 31.180

English version

**Test methods for electrical materials, interconnection
structures and assemblies**
Part 3: Test methods for interconnection structures (printed boards)
(IEC 61189-3:1997/A1:1999)

Méthodes d'essai pour les matériaux
électriques, les structures
d'interconnexion et les ensembles
Partie 3: Méthodes d'essai des
structures d'interconnexion
(cartes imprimées)
(CEI 61189-3:1997/A1:1999)

Prüfverfahren für Elektromaterialien,
Verbindungsstrukturen und Baugruppen
Teil 3: Prüfverfahren für
Verbindungsstrukturen (Leiterplatten)
(IEC 61189-3:1997/A1:1999)

<https://standards.iteh.ai/catalog/standards/sist/6f2ba806-7c78-4a4c-a1ca-c2fabf68e2ac/sist-en-61189-3-2001-a1-2001>

This amendment A1 modifies the European Standard EN 61189-3:1997; it was approved by CENELEC on 1999-08-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 Central Secretariat or to any CENELEC member.

This amendment 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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 52/805/FDIS, future amendment 1 to IEC 61189-3, prepared by IEC TC 52, Printed circuits, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 61189-3:1997 on 1999-08-01.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2000-05-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2002-08-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of amendment 1:1999 to the International Standard IEC 61189-3:1997 was approved by CENELEC as an amendment to the European Standard without any modification.

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SIST EN 61189-3:2001/A1:2001

<https://standards.iteh.ai/catalog/standards/sist/6f2ba806-7c78-4a4c-a1ca-c2fabf68e2ac/sist-en-61189-3-2001-a1-2001>

Annex ZA (normative)

Normative references to international publications
with their corresponding European publications

Addition:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60454-1	1992	Specifications for pressure-sensitive adhesive tapes for electrical purposes Part 1: General requirements	EN 60454-1	1994
IEC 60695-2-2	1991	Fire hazard testing Part 2: Test methods Section 2: Needle-flame test	EN 60695-2-2	1994
IEC 62326-4	1996	Printed boards Part 4: Rigid multilayer printed boards with interlayer connections - Sectional specification	EN 62326-4	1997
IEC 62326-4-1	1996	Part 4: Rigid multilayer printed boards with interlayer connections - Sectional specification Section 1: Capability Detail Specification Performance levels A, B and C	EN 62326-4-1	1997
ISO 4046	1978	Paper, board, pulp and related terms Vocabulary		

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INTERNATIONAL STANDARD

IEC 61189-3

1997

 AMENDMENT 1
1999-07

Amendment 1

**Test methods for electrical materials,
interconnection structures and assemblies –**

**Part 3:
Test methods for interconnection structures
(printed boards)**

<https://standards.iteh.ai/catalog/standards/sist/6f2ba806-7c78-4a4c-a1ca-c2fabf68e2ac/sist-en-61189-3-2001-a1-2001>

Amendement 1

**Méthodes d'essai pour les matériaux électriques,
les structures d'interconnexion et les ensembles –**

**Partie 3:
Méthodes d'essai des structures d'interconnexion
(cartes imprimées)**

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Commission Electrotechnique Internationale
 International Electrotechnical Commission
 Международная Электротехническая Комиссия

PRICE CODE

V

For price, see current catalogue

FOREWORD

This amendment has been prepared by IEC technical committee 52: Printed circuits.

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

FDIS	Report on voting
52/805/FDIS	52/825/RVD

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

A bilingual version of this amendment may be issued at a later date.

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Add the following figures to the list of figures:

- Figure 10 – Needle burner test [SIST EN 61189-3:2001/A1:2001](https://standards.iteh.ai/catalog/standards/sist/6f2ba806-7c78-4a4c-a1ca-c2fabf68e2ac/sist-en-61189-3-2001-a1-2001)
<https://standards.iteh.ai/catalog/standards/sist/6f2ba806-7c78-4a4c-a1ca-c2fabf68e2ac/sist-en-61189-3-2001-a1-2001>
- Figure 11 – Pencil holder [c2fabf68e2ac/sist-en-61189-3-2001-a1-2001](https://standards.iteh.ai/catalog/standards/sist/6f2ba806-7c78-4a4c-a1ca-c2fabf68e2ac/sist-en-61189-3-2001-a1-2001)
- Figure 12 – Composite test pattern
- Figure 13 – Test specimen

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2 Normative references

Insert, in the existing list, the titles of the following standards:

- IEC 60454-1:1992, *Specifications for pressure-sensitive adhesive tapes for electrical purposes – Part 1: General requirements*
- IEC 60695-2-2:1991, *Fire hazard testing – Part 2: Test methods – Section 2: Needle-flame test*
- IEC 62326-4:1996, *Printed boards – Part 4: Rigid multilayer printed boards with interlayer connections – Sectional specification*
- IEC 62326-4-1:1996, *Printed boards – Part 4: Rigid multilayer printed boards with interlayer connections – Sectional specification – Section 1: Capability Detail Specification – Performance levels A, B and C*
- ISO 4046:1978, *Paper, board, pulp and related terms – Vocabulary*

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7.2 Test 3D02: Conductor width and spacing (under consideration)

Replace this subclause by the following subclause:

7.2 Test 3D02: Conductor width and spacing

7.2.1 Object

The purpose of this test method is to provide a procedure for determining the conductor width and spacing of a printed board.

7.2.2 Test specimens

The specimen shall be a suitable printed board having conductor patterns for test.

Where the use of test coupons, as specified in IEC 62326-4-1, is agreed between the user and the supplier, the measurement shall be carried out on specimen F.

7.2.3 Test apparatus and materials

An illuminated eyepiece or microscope or projector having an ocular micrometer with a resolution of 0,01 mm or better shall be used.

7.2.4 Procedure

The conductor width and spacing between conductors shall be measured at random points, including central and corner areas, according to the relevant specification, and viewed vertically from above. The measured value shall be recorded to the nearest 0,01 mm. Edge defects such as indentations, projections, and slivers shall be excluded from measurement.

7.2.5 Report

The report shall include

- a) the test method number and revision;
- b) the date of the test;
- c) the identification and description of the specimen;
- d) the conductor width and spacing measured;
- e) the layer number;
- f) the number of measurements;
- g) the maximum and minimum observed conductor widths and spaces;
- h) the average conductor width and spaces;
- i) any deviation from this test method;
- j) the name of the person conducting the test.

7.2.6 Additional information

None.

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8.3 Test 3C03: Flammability; rigid printed board needle plane test (under consideration)

Replace this subclause by the following subclause:

8.3 Test 3C03: Flammability; needle flame test, rigid printed boards

8.3.1 Object

The object of the test is to determine the effect upon a printed board of exposure to a glowing wire under specific conditions.

The intensity of the ignition source is similar to that of an accidentally overheating or glowing of a single electronic component.

Reference should be made to 8.3 of IEC 60326-3, with regard to the fire integrity of printed boards and the suitability of test methods.

Timings measured by this test are an indication of the ability of the printed board to self-extinguish. There is no correlation with other properties of the material(s), such as the oxygen index.

8.3.2 Test specimen

The test specimen shall be a production board or a test board that is representative of the production board in terms of:

- base material(s);
- surface coating(s);
- type (for example multilayer, single-sided, etc.);
- size;
- design;
- surface area;
- thickness;
- metal distribution.

Test boards of 150 mm × 150 mm may be considered large enough to represent larger production boards. Smaller production boards should be tested in their actual size.

A minimum of five specimens shall be tested.

8.3.3 Test apparatus and materials

The following test apparatus and materials shall be used:

- a) A room or compartment, in which the test is conducted, having dimensions adequate to ensure that the test is carried out in a substantially draught-free atmosphere, but which allows a sufficient supply of air for normal combustion. Subdued light is advantageous.
- b) A burner to produce the test flame, which is a tube with a length of at least 35 mm with an internal diameter of $(0,5 \pm 0,1)$ mm and an external diameter not exceeding 0,9 mm. The burner shall be held in a movable fixture.

- c) A burner shall be supplied with butane gas having a minimum purity of 95 %. No air may be admitted to the burner tube. Propane gas may be used, but butane gas shall be the reference.

The burner shall be adjusted whilst in a vertical axis, in order to produce a flame having a height of (12 ± 1) mm. See figure 10a.

- d) A wooden board to be placed underneath the specimen. The board shall be covered with tissue paper which complies with 6.86 of ISO 4046. The distance between the lower edge of the specimen and the tissue paper shall be (200 ± 5) mm.
- e) A hand-operated timing device with a resolution of $\pm 0,5$ s or better.
- f) An air circulating oven capable of maintaining (125 ± 5) °C.
- g) A desiccator capable of maintaining 20 % R.H. or less.

8.3.4 Test procedure

The test specimens shall be pre-conditioned for 24 h at (125 ± 5) °C in an air-circulating oven. The test specimens shall then be allowed to stabilize for 4 h at room temperature in a desiccator over anhydrous calcium chloride.

The relevant specification shall detail the position of the test specimen and the point of application of the flame (for example surface, edge). The attitude of the specimen (for example horizontal or vertical) should mimic the intended mode of operation in the assembled equipment.

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Where surface application is used, the point of application of the flame shall, specimen size permitting, not be less than 10 mm from the nearest edge, in order to minimize edge effects.

Where edge application is used, the flame shall not, specimen size permitting, be less than 10 mm from the nearest corner.

The burner shall be mounted at an angle of about 45°, so that any drops from the test specimen can fall freely onto the underlying tissue paper.

If the intended operational attitude of the printed board is not known or is variable, the test specimens shall be positioned as follows.

Edge application: The lower edge shall be horizontal and the specimen shall be inclined at approximately 80°. The flame shall be applied to the lower side of the test specimen.

The burner shall be ignited away from the test specimen, and the height of the flame shall be adjusted to (12 ± 2) mm. The burner shall then be positioned as described, so that the test specimen penetrates the flame by approximately 2 mm. A vertical distance of between 8 mm and 10 mm from the tip of the burner and the surface or edge to be tested is adequate for this purpose. In the case of application to a vertical surface, a horizontal distance of approximately 5 mm is necessary.

The detail specification shall state the severity to be used.

Test flame application times as detailed in clause 5 of IEC 60695-2-2 are preferred. These severities are: 5 s - 10 s - 20 s - 30 s - 60 s - 120 s.

8.3.5 Report

The report shall include

- a) the test number and revision;
- b) the date of the test;
- c) the identification and description of the specimen;
- d) the number of specimens, if other than five;
- e) the position of the test specimens;
- f) the point of application of the test flame;
- g) the duration of application of the test flame;
- h) for each specimen whether flames and/or burning or glowing particles fall from the test specimen spreading fire to surrounding parts of the test specimen or to the tissue paper beneath the test specimen;
- i) for each specimen whether there is flame or glowing at the end of the application of the test flame;
- j) for each specimen whether the duration of burning is less than 30 s;
- k) any deviation from this test method;
- l) the name of the person conducting the test.

8.3.6 Additional information

There are obvious hazards associated with flammability testing. Training of test operators and familiarity with laboratory safety procedures is of paramount importance.

The smoothness of the specimen edges can be critical to the performance of the sample. A polished finish is recommended. A rough finish (for example blanked) will significantly degrade performance due to the increase in surface area available to the flame.

Small-scale flammability tests, such as the one described herein, are an indicator of the behaviour of the material(s) tested. Fire integrity of equipment in which printed boards are used can only be assessed by equipment level testing.