



JAPANESE
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STANDARD

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Japanese Standards Association

JIS C 6489 : 1999

**Base materials for printed circuits—
Epoxide non-woven/woven glass
reinforced copper-clad laminated
sheet of defined flammability
(vertical burning test)**

ICS 31.180

Descriptors : anodes, laminates, copper, printed circuits, printed-circuit bases, printed-circuit boards, cloth, textile glass, epoxides, plastics

Reference number : JIS C 6489 : 1999 (E)

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently **JIS C 6489 : 1994** is replaced with **JIS C 6489 : 1999**.

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In the event of any doubts arising as to the contents,
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**Base materials for printed circuits—
Epoxide non-woven/woven glass
reinforced copper-clad laminated sheet
of defined flammability
(vertical burning test)**

Introduction This Japanese Industrial Standard has been prepared based on the first edition of **IEC 60249-2-10** *Base materials for printed circuits—Part 2 : Specifications—Specification No. 10 : Epoxide non-woven / woven glass reinforced copper-clad laminated sheet of defined flammability (vertical burning test)* published in 1987 without modifying the technical contents. However, a partial modification has been given according to the actual condition in Japan and, in addition, the amendment to the said International Standard has been integrated into the text.

Portions underlined with dots are the matters not stated in the original International Standard.

The IEC Standard number is based on the new numbering system of IEC Standards put in force on January 1st 1997, and the Standard published before the said date is numbered by adding 60000 to the former number. This is only the change in the numbering system and the contents remain unchanged.

1 Scope This specification gives requirements for properties of epoxide non-woven/woven glass reinforced copper-clad laminated sheet of defined flammability (vertical fire resistance), in thicknesses of 0.7 mm up to 3.2 mm (hereafter referred to as “copper-clad laminated sheet”).

Remarks 1 To designate this material, the reference: 60249-2-10-FV0-IEC-EP-GF+GC-Cu may be used; if there is no risk of confusion, the type designation may be abbreviated to read IEC-60249-2-10-FV0.

2 The International Standard corresponding to this Standard is given below.

IEC 60249-2-10 : 1987 *Base materials for printed circuits—Part 2 : Specifications—Specification No. 10 : Epoxide non-woven / woven glass reinforced copper-clad laminated sheet of defined flammability (vertical burning test)*

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards indicated below shall be applied.

JIS C 6481 *Test methods of copper-clad laminates for printed wiring boards*

JIS C 6515 *Copper foil for printed wiring boards*

Remarks : **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)* is identical with the said standard.

IEC 60249-1 : 1982 *Base materials for printed circuits—Part 1 : Test methods.*
Amendment No. 3 (1991)

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

3 Materials and construction The sheet consists of an insulating base with metal foil bonded to one or both sides.

3.1 Insulating base Epoxide resin bonded composite laminate consisting of a non-woven glass-fibre (glass fibre paper or glass felt) core and glass cloth surface layers. Its flame resistance is defined in terms of the flammability requirements of Sub-clause 7.3.

3.2 Metal foil Copper as specified in **JIS C 6515**.

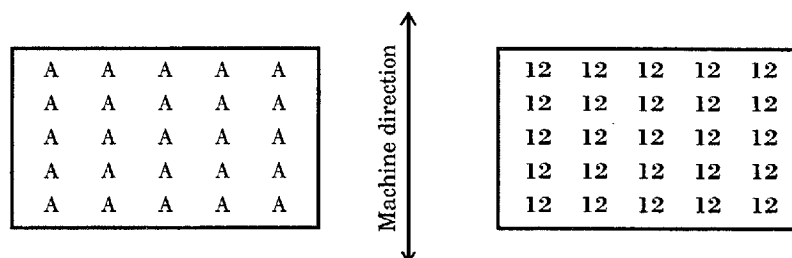
The preferred foils are Type E (electro-deposited copper) of standard ductility.

4 Internal marking Each sheet should bear a manufacturer's identification mark that is:

- in red, to indicate that the material is of defined flammability;
- repeated at intervals so that no part of the sheet is further than 75 mm from the furthest point of the nearest mark;
- as shown in Examples below, printed so as to indicate the machine direction of the filling material; if letters or numbers are used, these shall be upright in the machine direction.

Information : It may be omitted in accordance with the agreement between the parties concerned.

Examples :



The same as the table shown on the uppermost position of
IEC 60249-2-10 (First edition 1987).

5 Electrical properties