

Metal-clad base materials for printed wiring boards —

**Part 103: Special materials used in
connection with printed circuits —**

**Section 103.2 Specification for copper
foil for use in the manufacture of
copper-clad base materials**

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Electronic Components Standards Policy Committee (ECL/-) to Technical Committee ECL/19 upon which the following bodies were represented:

- British Telecommunications plc
- ERA Technology Ltd.
- Electrical and Electronic Insulation Association (BEAMA Ltd.)
- Electronic Components Industry Federation
- Electronic Engineering Association
- GAMBICA (BEAMA Ltd.)
- Institute of Circuit Technology
- Institute of Metal Finishing
- Ministry of Defence
- National Supervising Inspectorate
- Printed Circuit Association
- Telecommunication Engineering and Manufacturing Association

This British Standard, having been prepared under the direction of the Electronic Components Standards Policy Committee, was published under the authority of the Board of BSI and comes into effect on 28 February 1990

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The following BSI references relate to this standard:
Committee reference ECL/19
Draft for comment 89/23232 DC

ISBN 0 580 18190 1

Amendments issued since publication

Amd. No.	Date of issue	Comments

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National foreword

This Section of BS 4584 has been prepared under the direction of the Electronic Components Standards Policy Committee. It is identical with IEC 249-3A:1976 *“Base materials for printed circuits” — Part 3 “Special materials used in connection with printed circuits” — Specification No. 2. “Specification for copper foil for use in the manufacture of copper clad base materials”*, including the corrigendum issued in June 1980, published by the International Electrotechnical Commission (IEC).

Cross-reference

International standard	Corresponding British Standard
IEC 249-1:1982	BS 4584 Metal-clad base materials for printed wiring boards
	Part 1:1983 Methods of test (Identical)

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This specification gives requirements for properties of copper foil intended for use in the manufacture of copper-clad laminated sheets and of copper-clad flexible materials, used for printed wiring.

This specification applies to copper foil supplied in rolls, but by agreement between purchaser and vendor, may be applied to foil produced in sheets.

2 Designation

Copper foil for the uses considered in this specification may be either of two types, as specified by the purchaser:

- Type A, electro-deposited copper foil (standard or high ductility);
- Type B, rolled copper foil (as rolled, lightly cold-rolled, or rolled and annealed).

3 Mass per unit area, and thickness

The primary measure of quantity of copper foil shall be the mass per unit area, together with applicable tolerances. Thicknesses of copper foil corresponding to specified values of unit mass, together with corresponding tolerances for thickness, shall be regarded as given for information only. The requirements apply to both Type A and Type B, with the exception that the first line of the table is held under consideration for Type B and applies only to Type A.

Table I

Requirements				For information only					
Nominal mass per unit area		Deviation in per cent of nominal mass		Nominal thickness		Thickness deviation			
						Class I		Class II	
g/m ²	oz/ft ²	Class I	Class II	μm	in	μm	in	μm	in
152	0.5	± 10 %	± 5 %	18	0.0007	± 5	± 0.0002	± 2.5	± 0.0001
230	0.75	± 10 %	± 5 %	25	0.0010	± 5	± 0.0002	± 2.5	± 0.0001
305	1	± 10 %	± 5 %	35	0.0014	± 5	± 0.0002	± 2.5	± 0.0001
610	2	± 10 %	± 5 %	70	0.0028	± 8	± 0.0003	± 4.0	± 0.000 15
915	3	± 10 %	± 5 %	105	0.0042	± 10	± 0.0004	± 5.0	± 0.0002

Mass per unit area shall be determined by test method 1 of this specification.

4 Chemical analysis

Type A copper foil shall have a minimum purity of 99.8 % copper (with silver content regarded as copper), excluding any “as shipped” surface treatment.

Type B copper foil shall have a minimum purity of 99.9 % copper (with silver content regarded as copper), excluding any “as shipped” surface treatment.

The copper content shall be calculated as prescribed in test method 2 of this specification. The chemical analysis shall be carried out after removal of any surface treatment or contamination (e.g. grease) from the surface of the specimen.

5 Electrical properties

For both Type A and Type B copper foil having a nominal mass per unit area of 152 g/m² (0.5 oz/ft²), the minimum conductivity shall be 93.70 % of the International Annealed Copper Standard (IACS) at 20 °C (68 °F), equivalent to 0.163 59 Ωg/m² (= 1.840 · 10⁻⁸ Ωm in S.I. units).

For both Type A and Type B copper foil having a nominal mass per unit area equal to or greater than 305 g/m² (1 oz/ft²), the minimum conductivity shall be 96.16 % of the International Annealed Copper Standard (IACS) at 20 °C (68 °F), equivalent to 0.159 40 Ωg/m² (= 1.793 · 10⁻⁸ Ωm in S.I. units).