

Specification for

Varnish-bonded glass-braided copper conductors —

Part 2: Rectangular conductors

Co-operating organizations

The Electrical Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- Associated Offices' Technical Committee
- Association of Consulting Engineers
- Association of Manufacturers of Domestic Electrical Appliances
- Association of Mining Electrical and Mechanical Engineers
- Association of Supervisory and Executive Engineers
- British Electrical and Allied Manufacturers' Association*
- British Radio Equipment Manufacturers' Association*
- British Railways Board
- Crown Agents for Oversea Governments and Administrations
- Department of Employment
- Department of the Environment
- Department of Trade and Industry
- Electric Cable Makers' Confederation*
- Electrical Contractors' Association (Incorporated)
- Electrical Contractors' Association of Scotland
- Electrical Research Association*
- Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales
- Electronic Engineering Association*
- Engineering Equipment Users' Association
- Institution of Electrical Engineers
- Lighting Industry Federation Limited
- Ministry of Aviation Supply*
- Ministry of Defence
- Ministry of Defence, Army Department
- Ministry of Defence, Navy Department
- Municipal Passenger Transport Association (Incorporated)
- National Inspection Council for Electrical Installation Contracting
- National Physical Laboratory (Department of Trade and Industry)
- Oil Companies' Materials Association
- Post Office
- Public Road Transport Association
- South of Scotland Electricity Board

The Government department and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- British Non-ferrous Metals Federation High Conductivity Copper Group
- Covered Conductors Association
- Radio and Electronic Component Manufacturers' Federation
- Small Electric Motor Manufacturers' Association
- Society of Motor Manufacturers and Traders Limited
- Telecommunication Engineering and Manufacturing Association

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Contents

	Page
Co-operating organizations	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 General requirements and test conditions	1
4 Conductor	1
5 Covering	2
6 Elongation	3
7 Packaging	3
Appendix A Preferred sizes of conductor	4
Appendix B Methods of test for conductivity of aqueous extract	6
Appendix C Method of test for pH value	7
Appendix D Measurement of conductor dimensions and overall dimensions	8
Appendix E Breakdown voltage	8
Figure 1 — Cells for determination of conductivity of aqueous extract	6
Table 1 — Tolerances on dimensions	1
Table 2 — Radius on corners	1
Table 3 — Increase in dimensions due to the covering	2
Table 4 — Breakdown voltages	3
Table 5 — Elongation	3
Table 6 — Sizes of conductors	5

Foreword

This standard makes reference to the following British Standards:

BS 572, *Interchangeable conical ground glass joints*.

BS 1036, *Electrolytic tough pitch high conductivity copper*.

BS 1432, *Copper for electrical purposes. Strip with drawn or rolled edges*.

BS 2045, *Preferred numbers*.

BS 2565, *Drums for covered winding wires and strips for electrical purposes for use in the United Kingdom*.

BS 2757, *Classification of insulating materials for electrical machinery and apparatus on the basis of thermal stability in service*.

BS 3239, *Determination of resistivity of metallic electrical conductor materials*.

In accordance with the practice of publishing British Standards which as nearly as possible conform to internationally agreed recommendations, this standard closely follows the dimensions given in IEC Publication . . .¹⁾, the requirements in IEC Publication . . .¹⁾ and methods of test given in IEC Publication . . .¹⁾.

With the decline in the use of imperial units, BS 3058-2 will eventually be withdrawn.

The schedule of preferred sizes of conductors includes only some of the sizes in the R' series²⁾ at present in general use for transformer windings.

SI units are used, in preference to "metric technical units". The relationship between the units of force in the two systems is 1 N = 0.102 kgf.

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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8 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⁾ In course of preparation.

²⁾ See BS 2045, "Preferred numbers".

1 Scope

1.1 General. This Part of BS 4801 gives requirements and dimensions for solid copper conductors of rectangular section, covered with a single braid of glass fibre, bonded with a suitable varnish of either Class B, Class F or Class H rated temperature as given in BS 2757.

It does not apply to stranded or laminated conductors or to conductors covered with a layer of material other than the bonded glass braid.

1.2 Sizes. The requirements of the standard are applicable to conductors having thicknesses from 0.80 mm up to 5.6 mm and widths from 3.15 mm up to 12.5 mm. A schedule of preferred sizes is given in Appendix A.

1.3 Thickness of covering. Four thicknesses of covering, Grade 0, Grade 1, Grade 2 and Grade 3, are specified.

NOTE 1 *Edgewise bending.* Covered conductors in accordance with this British Standard are not necessarily suitable for severe edgewise bending. Any special test requirements should be agreed between the purchaser and the manufacturer.

NOTE 2 The titles of the British Standards referred to in this standard are listed on page ii.

2 Definitions

For the purposes of this British Standard, the following definitions apply:

2.1

wire

the insulated material as received

2.2

conductor

the bare metal after removal of the glass covering

2.3

increase in dimensions due to the covering

the difference between the measurement over the bonded glass covering on the smaller dimension and the corresponding measurement of the conductor

2.4

tolerance

the permissible divergence of an actual magnitude from that prescribed

3 General requirements and test conditions

3.1 Unless otherwise specified, all tests shall be carried out within a temperature range of 15 °C to 35 °C and a relative humidity of 45 % to 75 %. Before measurements are made, the specimens shall be preconditioned under these atmospheric conditions for a time sufficient to allow them to reach stability.

3.2 The wire to be tested shall be removed from the packaging in such a way that the wire will not be subjected to tension or unnecessary bends; before each test sufficient wire shall be discarded to ensure that any damaged wire is not included in the test specimens.

3.3 When no specific range of sizes is given for a test, the test is applicable to all sizes.

4 Conductor

4.1 Material. The conductor shall be manufactured from high conductivity copper complying with the requirements of BS 1036. Before covering, the conductor shall comply with the requirements of BS 1432 for annealed copper strip.

4.2 Tolerance on conductor dimensions. The conductor dimensions shall not differ from the nominal values by more than the tolerance given in Table 1.

Table 1 — Tolerances on dimensions

Width or thickness		Tolerance ±
Over	Up to and including	
mm	mm	mm
—	3.15	0.030
3.15	6.30	0.050
6.30	12.5	0.070

4.2.1 Radius on corners. The radius on the corners of the bare conductor shall be maintained within 25 % of the values given in Table 2. They shall merge smoothly into the flat, and the conductor shall be free from sharp, rough and projecting edges.

Table 2 — Radius on corners

Nominal thickness of conductor		Corner radius
Over	Up to and including	
mm	mm	mm
—	1.00	Semicircular
1.00	1.60	0.50 ^a
1.60	2.24	0.65 ^b
2.24	3.55	0.80
3.55	—	1.00

^a Or semicircular for wires with widths greater than 4.75 mm, when so agreed between the purchaser and the manufacturer.

^b Or 0.80 mm for wires with widths greater than 4.75 mm, when so agreed between the purchaser and the manufacturer.