

**SPECIFICATION FOR
VARNISH-BONDED
GLASS-LAPPED
COPPER CONDUCTORS**

Part 1. Round wire

BS 4799 : Part 1 : 1972

THIS BRITISH STANDARD, having been approved by the Electrical Industry Standards Committee, was published under the authority of the Executive Board on 25 May, 1972.

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The Institution desires to call attention to the fact that this British Standard does not purport to include all the necessary provisions of a contract.

A complete list of British Standards, numbering over 5000, fully indexed and with a note of the contents of each, will be found in the British Standards Yearbook, which may be purchased from BSI Sales Department. It may also be consulted in many public libraries and similar institutions.

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 1489. The packaging of covered winding wires for electrical purposes.
- BS 2757. Classification of insulating materials for electrical machinery and apparatus on the basis of thermal stability in service.

British Standards are revised, when necessary, by the issue either of amendment slips or of revised editions. It is important that users of British Standards should ascertain that they are in possession of the latest amendments or editions.

The following BSI references relate to the work on this standard:
Committee reference ELE/36 Draft for comment 70/3816

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CONTENTS

Co-operating organizations	Page 4
Foreword	5

SPECIFICATION

1. Scope	5
2. Definitions	6
3. General requirements and test conditions	6
4. Conductor	6
5. Covering	8
6. Elongation	10
7. Packaging	10

APPENDICES

A. Measurement of conductor diameter and overall diameter	11
B. Electrical resistance	12
C. Method of test for conductivity of aqueous extract	14
D. Method of test for pH value	17
E. Breakdown voltage	18

TABLES

1. Tolerances on conductor diameter	7
2. Increase in diameter due to the covering	8
3. Breakdown voltages	10
4. Temperature correction factors	13
5. Dimensions, resistance and elongation	19

FIGURE

1. Cells for determination of conductivity of aqueous extract	16
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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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Part 1. Round wire

FOREWORD

In accordance with the practice of publishing British Standards which conform as closely as possible to internationally agreed recommendations, this replacement for BS 1933, Part 3 conforms with the dimensions given in IEC Publication 182, 'Basic dimensions of winding wires', the methods of test given in IEC Publication . . . * and the requirements in IEC Publication . . . *.

With the decline in the use of imperial units, BS 1933, Part 1 will eventually be withdrawn.

Some wire sizes additional to those recommended in IEC Publication 182 have been included at the request of certain sections of the electrical industry. These are indicated as non-preferred sizes.

SI units are used in preference to 'metric technical units'. The relationship between the units of force in the two systems is $1 \text{ N} = 0.102 \text{ kgf}$.

Requirements for rectangular conductors covered with varnish-bonded glass lapping are given in Part 2 of this British Standard.

SPECIFICATION

1. SCOPE

1.1 General. This Part of BS 4799 gives requirements and dimensions for round copper wire covered with a single or double lapping 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 conductors, or covered conductors having a layer of material other than bonded glass or to braided glass coverings,

1.2 Sizes. The requirements of the standard are applicable to wires having bare diameters from 0.250 mm to 4.000 mm inclusive. The standard sizes are given in Table 5. The preferred sizes are given in bold type.

*In course of preparation.

1.3 Thickness of covering. Two thicknesses of covering are specified as follows:

- Grade 1. Applicable to wires having a bare diameter from 0.250 mm up to and including 2.000 mm.
- Grade 2. Applicable to wires having a bare diameter from 0.250 mm up to and including 4.000 mm.

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

2. DEFINITIONS

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

- (1) *Wire*. The insulated material as received.
- (2) *Conductor*. The bare metal after removal of the glass covering.
- (3) *Increase in diameter due to the covering*. The difference between the diameter over the glass covering and the diameter of the conductor.
- (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.

4.2 Tolerance on conductor diameter. When measured by the method described in Appendix A the conductor diameter shall be within the appropriate limits given in Table 5. These have been obtained by applying the tolerances given in Table 1.

4.2.1 Out-of-roundness of conductor. The out-of-roundness, as defined in Appendix A, shall not exceed the figure given in Column 2 of Table 1.