

Specification for

**Copper and copper-cadmium
stranded conductors for
overhead electric traction and
power transmission systems**

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by Technical Committee NFE/34, Copper and copper alloys, upon which the following bodies were represented:

- British Bathroom Council
- British Cable Makers Confederation
- British Non-Ferrous Metals Federation
- British Refrigeration Association
- British Valve and Actuator Manufacturers' Association
- Copper Development Association
- Inco Europe Limited
- London Metal Exchange
- Non-Ferrous Metal Stockists
- Transmission and Distribution Association (BEAMA Limited)

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Railways Board
- Institution of Incorporated Executive Engineers
- Society of Motor Manufacturers and Traders

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Foreword

This British Standard has been prepared by Technical Committee NFE/34/2. This revision supersedes BS 125 : 1970 and BS 2755 : 1970, which are withdrawn.

Copper and copper alloy conductors for overhead electric traction are also dealt with in BS 23.

In this revision due regard has been given to the work of the International Organization for Standardization (ISO) when reviewing the testing requirements, properties and physical dimensions of conductors. Where applicable, if possible, the requirements of this British Standard have been aligned with those of corresponding International Standards. However, it has been necessary to go outside ISO dimensions to specify conductors that are suitable for use with fittings currently in use.

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 10, an inside back cover and a back cover.

Specification

1 Scope

This British Standard specifies requirements for solid and stranded circular conductors for overhead power transmission systems and overhead electric traction systems. It specifies the requirements for material composition, dimensions, mechanical properties, electrical resistance, stranding, and other characteristics for hard-drawn high conductivity copper and copper alloy conductors.

NOTE. Guidance on information that should be supplied by the purchaser is given in annex A.

2 References

2.1 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies: any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

For the purpose of this British Standard the following definitions apply.

3.1 solid conductor

Conductor consisting of one wire of circular cross-section.

3.2 stranded conductor

Conductor consisting of a number of circular wires of the same nominal diameter, having a central core wire surrounded by one or more layers of helically laid wires. When the conductor consists of more than one layer, alternate layers are stranded in opposite directions.

3.3 wire diameter

Mean of two micrometer measurements taken at right angles to each other at any one cross-section of the wire.

3.4 circularity

Degree by which the cross-section of a wire conforms to a circle.

NOTE. Circularity is ascertained by comparing the maximum and the minimum diameters measured at the same cross-section of the wire.

3.5 direction of lay

For stranded conductors, the direction in which the helically laid outer strands are wound round the central core wire.

NOTE. Wires conform to the direction of the central part of the letter 'Z' when the conductor is held vertically and viewed from the side. For left-hand lay, the wires conform to the central part of the letter 'S' when the conductor is held vertically and viewed from the side.

3.6 lay length

Axial length of one complete turn of the helix formed by an individual wire in a stranded conductor.

3.7 lay ratio

Ratio of the lay length to the external diameter of the corresponding layer of wires in the stranded conductor.

4 Requirements

4.1 Composition

Copper conductors shall be manufactured from high conductivity copper wires conforming to the composition requirements for BS 6926 : 1988, grade C100, C101 or C102, the choice of grade being at the discretion of the manufacturer. Copper alloy conductors shall be manufactured from wires conforming to the composition requirements for BS 2873 : 1969, alloy C108 or other composition requirements agreed between the purchaser and the supplier.

4.2 Dimensions, tolerances and masses

4.2.1 Solid conductors

The dimensions and masses of solid conductors shall conform to tables 1 and 2.

The conductor shall not depart from circularity (see 3.4) by more than 2 % of the nominal diameter.

4.2.2 Component wires of stranded conductors

The dimensions of component wires for stranded conductors before stranding shall conform to tables 1 and 2, as appropriate.

The cross-section of any wire before stranding shall not depart from circularity (see 3.4) by more than 2 % of the nominal wire diameter.

The mass per unit length of the wire before stranding shall be no more than 2 % greater than the nominal value given in tables 1 and 2, as appropriate.