

Please be aware that this PDF has been created from the original hardcopy document, which might not be in good condition and so the PDF might reflect this.

OFFICE COPY. NO AND

Committed Room B

No. 837—1939.

British Standards Institution

Incorporated by Royal Charter.

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE.

INCORPORATED IN 1918 AS THE BRITISH ENGINEERING STANDARDS ASSOCIATION.

Withdrawn June 1956

BRITISH STANDARD

SPECIFICATION

FOR

STEEL-CORED COPPER CONDUCTORS

FOR

OVERHEAD TRANSMISSION PURPOSES.

LONDON:

PUBLISHED BY THE BRITISH STANDARDS INSTITUTION,

PUBLICATIONS DEPARTMENT,

23, VICTORIA STREET, LONDON, S.W. 1.

Telegrams: Standards, Soviet, London. Telephone: Abbey 5333.

March, 1939.

COPYRIGHT

ALL RIGHTS RESERVED, INCLUDING RIGHTS OF TRANSLATION.

Price 2/- net. Post free 2/2.

No. 837—1939.

British Standards Institution
Incorporated by Royal Charter.

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE.
INCORPORATED IN 1918 AS THE BRITISH ENGINEERING STANDARDS ASSOCIATION.

BRITISH STANDARD
SPECIFICATION

FOR

STEEL-CORED COPPER CONDUCTORS

FOR

OVERHEAD TRANSMISSION PURPOSES.

This Specification, having been adopted by the Electrical Industry Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council as a British Standard on 20th March, 1939.

LONDON:
PUBLISHED BY THE BRITISH STANDARDS INSTITUTION,
PUBLICATIONS DEPARTMENT,
38, VICTORIA STREET, LONDON, S.W.1.

Telegrams: Standards, Sowest, London. Telephone: Abbey 8385.

March, 1939.

COPYRIGHT.

ALL RIGHTS RESERVED. INCLUDING RIGHTS OF TRANSLATION.

Price 2/- net. Post free 2/2.

(2)

(3)

CONTENTS.

	PAGE
Co-operating Organisations ...	3
Foreword ...	4
DEFINITIONS.	
1. Definitions ...	5
STANDARDS FOR HARD-DRAWN COPPER.	
2. Resistance at 60°F. ...	6
3. Density at 60°F. ...	6
4. Constant-mass Temperature Coefficient at 60°F. ...	6
5. Coefficient of Linear Expansion ...	6
SPECIFICATION.	
6. Material ...	7
7. Resistances, Weights and Sizes of Solid Wires... ..	7
8. Resistances, Weights and Standard Sizes of Steel-cored Copper Conductors ...	7
9. Tolerances on the Weights, Resistances and Diameters of Wires ...	9
10. Mechanical Properties ...	10
11. Freedom from Defects ...	11
12. Joints in Wires and Conductors... ..	11
13. Stranding ...	11
14. Test Samples ...	12
15. Mechanical Tests ...	12
16. Resistance Test ...	14
TABLES.	
1. Solid Copper Conductors used in the Construction of Standard Steel-cored Copper Conductors ...	17
2. Solid Steel Wires used in the Construction of Standard Steel-cored Copper Conductors ...	19
3. Stranded Steel-cored Copper Conductors with Low Steel Ratio ...	20
4. Stranded Steel-cored Copper Conductors with High Steel Ratio ...	21
APPENDIX.	
Secondary Standards for Steel-cored Copper Conductors ...	22

CO-OPERATING ORGANISATIONS.

The Electrical Industry Committee under whose supervision this British Standard was prepared consists of representatives from the following Government Departments and Scientific and Industrial Organisations :—

- Admiralty.
- *Central Electricity Board.
- *Electricity Commissioners.
- *General Post Office.
- H.M. Office of Works.
- Home Office.
- *National Physical Laboratory.
- *War Office.
- *Association of Consulting Engineers.
- *British Electrical and Allied Manufacturers' Association.
- British Electrical and Allied Industries Research Association.
- *Cable Makers' Association.
- Electric Lamp Manufacturers' Association.
- Electrical Contractors' Association (Incorporated).
- *Incorporated Association of Electric Power Companies.
- *Incorporated Municipal Electrical Association.
- *Institution of Electrical Engineers.
- London Electricity Supply Association.
- Provincial Electric Supply Association.
- Railway Companies of Great Britain.
- Tramways, Light Railways, and Transport Association.

The Government Departments and Scientific and Industrial Organisations 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 :—

- Crown Agents for the Colonies.
- India Office.
- Mines Department.
- British Pottery Manufacturers' Federation.
- British Steel Wire Industries Association.
- Copper Development Association.
- High Conductivity Association.

† The Electrical Industry Committee is the British National Committee of the International Electrotechnical Commission.

FOREWORD.

This Specification has been prepared at the request of the Copper Development Association and forms one of a series of British Standards for overhead conductors authorised by the Electrical Industry Committee.

The other Specifications in the series are as follows:—

B.S. 215. Hard-drawn Aluminium and Steel-cored Aluminium Conductors for Overhead Transmission Purposes.

B.S. 446. Braided Cables, with Copper Conductors, for Overhead Transmission Lines.

B.S. 672. Hard-drawn Cadmium-Copper Solid and Stranded Circular Conductors for Overhead Transmission.

The Committee responsible for the preparation of this Specification has taken note of the numerous sizes of steel and copper wires which may be used for a required equivalent copper sectional area and has only included as Standard Sizes those for which there has been a general demand. It should be noted, however, that the sizes of steel-cored copper conductors tabulated in the Specification, while being representative, may not be the most economical for all service conditions.

This Specification requires reference to the following British Standard:—

B.S. 443. Testing of the Zinc Coating on Galvanised Wires.

In order to keep abreast of progress in the Industries concerned, the British Standards are subject to periodical review.

Suggestions for improvements, addressed to the British Standards Institution, 28, Victoria Street, London, S.W.1., will be welcomed at all times. They will be recorded, and in due course brought to the notice of the Committees charged with the revision of the publications to which they refer.

NOTE.—The Institution desires to call attention to the fact that this Specification is intended to include all the technical provisions necessary for the supply of the material herein referred to, but does not purport to include all the necessary provisions of a contract.

BRITISH STANDARD

SPECIFICATION

FOR

STEEL-CORED COPPER CONDUCTORS

FOR

OVERHEAD POWER TRANSMISSION PURPOSES.

DEFINITIONS.

Definitions.*

1. The following definitions have been adopted for the purpose of this Specification:—

(a) *Solid Conductor*.—A conductor composed of one 15 circular wire.

(b) *Steel-cored Copper Conductor*.—A stranded conductor composed of circular wires the inner one or more of which are of steel and the outer of copper. The complete conductor comprises a core of 1, 3 or 7 steel wires over which a concentric 20 layer or layers of solid copper conductors is, or are, lapped with a definite lay, the number of solid conductors in each layer usually increasing in arithmetical progression.

(c) *Diameter*.—As applied to a solid conductor is the mean of three equally spaced measurements taken on the 25 same cross section.

(d) *Lay Ratio*.—The ratio of the axial length of a complete turn of the helix formed by any individual wire in a stranded conductor to the mean diameter of the helix.

(e) *Tolerance*.—The permissible difference in magnitude 30 from the magnitude prescribed.

(f) *Piece*.—A single length of conductor.

(g) *Test Sample*.—A sample taken for test in accordance with the Specification.

(h) *One Ton* = 2 240 lb.

* For a full list of definitions of terms used in connection with Conductors and Cables, see Section 5 of the British Standard Glossary of Terms used in Electrical Engineering, (B.S. 205).