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SPECIFICATION FOR
IMPREGNATED
PAPER-INSULATED CABLES
FOR ELECTRICITY SUPPLY

**Part 1. Lead or lead alloy sheathed
cables for working voltages up to
and including 33 kV**

BS 6480 : Part 1 : 1969

*Including amendment May 1970 [AMD 515],
No. 2 dated 17/4/74 [AMD 1409], &
No. 3 " 30/1/76 [AMD 1866]
No. 4 " 31/8/76 [AMD 2066]*

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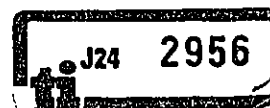
BRITISH STANDARDS INSTITUTION

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THIS BRITISH STANDARD, having been approved by the Electrical Industry Standards Committee Executive Board, was published under the authority of the Executive Board on 21 November, 1969.

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Third revision July, 1966.

BS 6480 (metric revision of BS 480) published November, 1969.

SBN: 580 05753 4

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.

In order to keep abreast of progress in the industries concerned, British Standards are subject to periodical review. Suggestions for improvements will be recorded and in due course brought to the notice of the committees charged with the revision of the standards to which they refer.

This standard makes reference to the following British Standards:

BS 77. Voltages for a.c. transmission and distribution systems.

BS 358. Method for the measurement of voltage with sphere-gaps (one sphere earthed).

BS 698. Papers for electrical purposes.

BS 801. Lead and lead alloy sheaths of electric cable.

BS 923. *Guide on high-voltage testing techniques*

BS 1442. Galvanized mild steel wire for armouring cables.

BS 3631. Method for the determination of the ash of paper and board.

BS 4066. Flame-retardant characteristics of electric cables.

BS 6360. Copper conductors in insulated cables and cords.

BS 6746. PVC-insulation and sheath of electric cables.

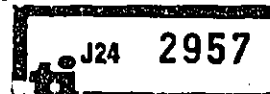
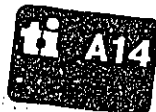
BS 6791. Aluminium conductors in insulated cables.

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 references ELE/3, ELE/3/31 Draft for comment 68/17552

BS 4727. Glossary of electrotechnical, power, telecommunication, electronics, lighting and colour terms.
Part 2 : Terms particular to power engineering.
Group 08 : Power cable terminology.

BS 5099. Spark testing of electric cables.

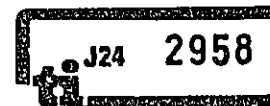


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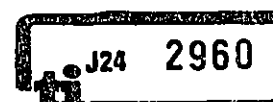
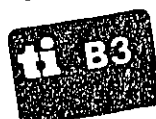
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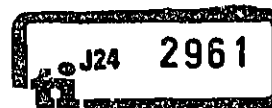
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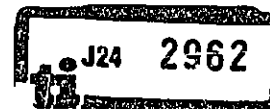
CO-OPERATING ORGANIZATIONS

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 Mining Electrical and Mechanical Engineers
- *Association of Supervising Electrical Engineers
- *British Electrical and Allied Manufacturers' Association
- *British Railways Board
- British Radio Equipment Manufacturers' Association
- *Crown Agents for Oversea Governments and Administrations
- Department of Employment and Productivity
- *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 Ltd.
- *Ministry of Technology
- Ministry of Defence
- *Ministry of Defence, Army Department
- Ministry of Defence, Navy Department
- *Ministry of Power
- *Ministry of Public Building and Works
- *Municipal Passenger Transport Association (Incorporated)
- National Inspection Council for Electrical Installation Contracting
- *National Physical Laboratory (Ministry of Technology)
- *Oil Companies Materials Association
- *Post Office
- Public Transport Association (Incorporated)
- South of Scotland Electricity Board

The Government departments 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:

- Aluminium Federation
- Copper Development Association
- British Plastics Federation
- Institute of Iron and Steel Wire Manufacturers
- London Transport Board
- National Coal Board



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Part 1. Lead or lead alloy sheathed cables for working
voltages up to and including 33 kV

FOREWORD

This British Standard is published in advance of the date on which the cables become available to enable manufacturers and users to be forewarned of impending changes arising from this revision.

The cable industry intends that cables complying with this standard shall be available from the 1st January, 1970 when BS 480: 1966 (inch version) will be withdrawn.

This revision of BS 480 includes requirements for lead or lead alloy sheathed cables, and smooth and corrugated aluminium sheathed cables in metric units. These requirements are based, where appropriate, on IEC Recommendations and are given in separate, self-contained parts as follows:

Part 1. Lead or lead alloy sheathed cables for working voltages up to and including 33 kV.

Part 2. Aluminium sheathed cables for working voltages up to and including 33 kV.

In this revision designs of cables have been modified in order to economize in the use of materials, where this has been possible without sacrificing technical performance; the thickness of lead sheath has been reduced and some reductions have been made in the insulation thickness.

Attention is drawn to the thicknesses of lead sheath in the tables, which are nominal and are subject to the tolerance given in Clause 14.

The number of rated voltages recognized has been reduced, but a larger range of cables is given for each rated voltage, including the introduction of cables with Milliken, sectoral circular and solid aluminium conductors, the two latter being for a rated voltage of 600/1000 V only.

Type tests for anti-corrosion coverings have been omitted because extruded coverings only are specified. Since the material and thickness are given, these coverings are regarded as acceptable on the basis of experience and previous type tests. Attention is drawn to the recommendations for the selection and operation of cables, and installation, which are given in Appendices A and B.

NOTE. Attention is drawn to certification facilities offered by BSI; see back cover of this standard.

SPECIFICATION

1. SCOPE

This British Standard gives requirements and dimensions for impregnated paper-insulated cables for operation up to and including 19 000 V to metal sheath and 33 000 V between conductors. It includes mass-impregnated, mass-impregnated non-draining, and pre-impregnated types of cables. The sheath may be of lead or lead alloy and provision is made for armour and protective coverings.

The cables included in the standard are:

600/1000 V single-core, twin, three-core, four-core and five-core.

1900/3300 V, 3800/6600 V, 6350/11 000 V and 8700/15 000 V single-core and three-core.

12 700/22 000 V and 19 000/33 000 V single-core, three-core and three-core SL.

2. DEFINITIONS

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

(1) *Rated voltage, E_0* . The power frequency voltage to earth for which the cable is designed.

(2) *Rated voltage E* . The power frequency voltage between conductors for which the cable is designed.

For other definitions, reference should be made to BS 4727: Part 2: Group

NOTE. The abbreviation STA has been used in the tables in this standard for steel tape armour, and SWA for steel wire armour. 08*

3. VOLTAGE DESIGNATION

The cable shall be designated by the rated voltages E_0 and E , expressed in the form E_0/E .

The rated voltages recognized for the purposes of this British Standard are 600/1000, 1900/3300, 3800/6600, 6350/11 000, 8700/15 000, 12 700/22 000, and 19 000/33 000.

NOTE 1. Where a rated voltage is one of the standard system voltages given in BS 77, 'Voltages for a.c. transmission and distribution systems', it may be assumed that the cable may be operated continuously at the corresponding highest voltage given in that British Standard. Otherwise, it may be assumed that the cable may be operated continuously at a power-frequency voltage 10% above the rated voltage.

NOTE 2. Guidance on the selection of cables of appropriate voltage designations for particular systems is given in Appendix A.

