

Electrical installations for open-cast mines and quarries —

Part 3: Recommendations for equipment and ancillaries

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- Associated Offices Technical Committee
- British Coal
- China Clay Association
- Electric Cable Makers' Confederation
- Electrical Contractors' Association
- Engineering Equipment and Materials Users' Association
- Federation of Civil Engineering Contractors
- Federation of Manufacturers of Construction Equipment and Cranes
- Health and Safety Executive
- Independent Engineering Insurers' Committee
- Institution of Mining and Metallurgy

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Foreword

This Part of BS 6907 has been prepared under the direction of the Mining and Quarrying Requisites Standards Committee. BS 6907 is based on the International Electrotechnical Commission's publication IEC 621 "*Electrical installations for outdoor sites under heavy conditions (including open-cast mines and quarries)*" and, like that publication, is published in Parts as follows.

- *Part 1: Glossary;*
- *Part 2: General recommendations for protection against direct contact and electric shock;*
- *Part 3: Recommendations for equipment and ancillaries;*
- *Part 4: Recommendations for winning, stacking and processing machinery, pumps and low signal level and communications systems;*
- *Part 5: Recommendations for operation.*

BS 6907 sets out the guiding principles for the installation and operation of electrical equipment so as to ensure safety of persons, livestock, property and proper functioning of the plant.

It applies to the installation and operation of electrical apparatus and systems associated with outdoor sites under heavy conditions, including open-cast mines, quarries, stockpiles, etc. It applies particularly to electrical apparatus and systems used for the following:

- a) winning, stacking and primary processing machinery;
- b) secondary processing machinery;
- c) conveyor systems;
- d) pumping and water supply systems;
- e) movable railway systems;
- f) control, signal, supervisory and communication systems.

BS 6907 does not cover temporary and provisional places of work in the open, such as building sites and earth-moving sites, unless the equipment used is similar to that used in surface mining applications.

It takes account of British practice, electrical regulations and law and thereby differs in several respects from the IEC publication. Both cover a subject not previously the subject of an international standard or a British Standard.

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 10, an inside back cover 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 Scope

This Part of BS 6907 gives recommendations for good practice for the safe and efficient installation and use of electrical equipment and ancillaries.

For winning, stacking and processing machinery, pumps and low signal level and communications systems, exemptions from these recommendations and supplementary recommendations are given in BS 6907-4, which should, therefore, be read in conjunction with this Part.

NOTE 1 A glossary of terms used in this standard is given in BS 6907-1.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 General

2.1 Design and selection

Design and selection of apparatus or equipment should be on the basis of expected loading, operating characteristics and cyclic duty taking into consideration the protection required in special and arduous environmental, operational, transportation and storage conditions including:

- high altitude;
- low and/or high ambient temperature;
- supply voltage variations;
- supply frequency variations;
- insecure power supply and transients;
- high or low humidity;
- environment (dust, wind pressure, marine atmosphere, etc.);
- flammable and/or explosive materials and/or atmosphere;
- vermin, including rodents or other small animals;
- localities prone to natural catastrophes;
- ecological impact.

In order to ensure that correct design parameters are selected, mutual agreement should be reached between the user and the supplier as to the quantitative and/or qualitative conditions.

2.2 Relevant standards

All electrical apparatus or equipment should be in accordance with the relevant British Standards.

2.3 Materials

Materials used in the construction of apparatus or equipment should be appropriate for the operational conditions, including temperature, altitude, moisture, etc.

2.4 Protection

Protection should be provided against damage, explosion, and/or over-heating during normal operation and expected fault conditions.

2.5 Operating conditions

Apparatus or equipment should be designed to meet such conditions as vibration, acceleration, deceleration, slewing and angles of inclination (tilting and mounting) which may occur under expected operational conditions.

2.6 Site conditions

Apparatus or equipment should be installed so that design features such as cooling systems are not impaired by external factors such as position, blocking of ventilation ducts, hostile environment, etc.

2.7 Earth terminal

An earth terminal should be provided on all enclosures of apparatus and equipment operating at a voltage in excess of extra low voltage.

NOTE See the IEE Regulations for the definition of extra low voltage.

2.8 Noise limitations

Consideration should be given in the design to limit the emission of noise.

2.9 Pollution by cooling medium (coolant)

Adequate precautions should be provided to prevent spillage of the cooling medium causing pollution of the environment, for example, groundwater storages, harbours, waterways, soil, etc.

Where equipment with a flame-retardant cooling medium is used, the installation should be so arranged as to inhibit the possible atmospheric contamination and noxious effects of the cooling medium.

3 Rotating machines

3.1 Mechanical construction

Rotating machines used in applications where high acceleration, overspeed, reversing or braking may be employed should be designed and constructed so as to withstand expected stresses that may occur to parts such as rotor windings or cages, stators, stator end windings, shafts and couplings.

3.2 Mechanical protection

Rotating machines should be so constructed and guarded as to prevent contact with moving parts.