BS 7846:2009

BSI British Standards

Electric cables – Thermosetting insulated, armoured, fire-resistant cables of rated voltage 600/1 000 V, having low emission of smoke and corrosive gases when affected by fire – Specification

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Contents

Summary of pages
This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 48, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 30 September 2009. It was prepared by Subcommittee GEL/20/17, *Low voltage cables*, under the authority of Technical Committee GEL/20, *Electric cables*. A list of organizations represented on these committees can be obtained on request to their secretary.

Supersession

This British Standard supersedes BS 7846:2000, which is withdrawn.

Information about this document

This new edition makes changes to the scope to include types of fire resistant cables for use in the construction and industrial sector for life safety, fire fighting, property protection and business continuity applications. It requires that all cables meet, as a minimum requirement, the fire resistance category F2 and introduces the additional options of resistance to fire with direct mechanical impact and water in combination for varying periods of time, which are assessed in accordance with BS 8491, and classified in this standard as categories F30, F60 and F120. Alternative armour wire sizes and new armour constructions, which might be appropriate for certain of these optional categories, are also introduced.

BS 8491:2008 describes a method for assessment of the fire integrity of large diameter power cables for use as components of smoke and heat control systems as given in BS 7346-6 and certain other active fire safety systems. It is applicable to cables of rated voltages not exceeding 600/1 000 V and of overall diameter greater than 20 mm.

NOTE The test method given in BS 8491:2008 is technically identical with the test method given in BS 7346-6:2005, Annex B. It is intended that when BS 7346-6:2005 is amended Annex B will be taken out.

As with the previous edition, performance under fire conditions is assessed on the basis of tests which measure, under defined conditions, the flame propagation, emission of smoke and corrosive gases, and fire resistance.

Product certification/inspection/testing. Users of this British Standard are advised to consider the desirability of third-party certification/inspection/testing of product conformity with this British Standard. Users seeking assistance in identifying appropriate conformity assessment bodies or schemes may ask BSI to forward their enquiries to the relevant association.

Hazard warnings

WARNING. This British Standard calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is "shall".

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

1 Scope

This British Standard specifies requirements for construction and performance, and describes methods of test, for armoured, fire-resistant cables with thermosetting insulation and of rated voltage 600/1 000 V and low emission of smoke and corrosive gases when affected by fire.

The circuit integrity performance under fire conditions is assessed on the basis of various tests which either separately measure resistance to fire, resistance to fire with water spray, and resistance to fire with mechanical shock (Category F2) or in combination measure resistance to fire with direct mechanical impact and water jet (Categories F30, F60 and F120).

Cables specified in this standard are intended for use in fixed installations in industrial areas, buildings and similar applications, where maintenance of power supply during a fire is required for a defined period of time.

NOTE 1 Attention is drawn to the fact that the ability of a given cable to meet a particular category in this standard refers only to the test conditions stated, and the level of performance achieved in a particular installation can be influenced by actual installation conditions.

Cables covered by this standard have limited evolution of smoke and corrosive gases when assessed under the fire conditions as specified in BS EN 61034-2 and BS EN 50267-2-1.

In this standard, the level of corrosive (and acid) gases is determined by measurement of hydrochloric acid (HCl) in accordance with BS EN 50267-2-1.

The insulation and other components are suitable to permit operation of the cables at a maximum sustained conductor temperature of 90 °C and for a maximum short-circuit conductor temperature of 250 °C.

NOTE 2 Limitation on the temperature of the cables may be imposed in situations where they may be touched.

NOTE 3 Due to the relatively high conductor temperature, there is a risk of drying out the surrounding soil causing an increase in thermal resistivity which in turn would lead to the cable temperature rising to a higher value than anticipated. For cable laid directly in the ground, a suitable de-rating factor should be applied or a lower maximum sustained conductor operating temperature should be assumed to take into account the possible effects of soil drying out.

NOTE 4 In installations which include cable joints and terminations, the performance of these accessories should be taken into account in deciding the maximum operating temperature of the cable.

The cables specified in the standard are either steel wire armoured or interlocked steel tape armoured and sheathed, as follows:

a) two-, three-, four- and five-core stranded copper conductor;

b) multicore auxiliary stranded copper conductor.

Annex A gives recommendations for the selection and operation of cables while recommendations for the installation of cables are given in Annex B. Annex C lists the information that should be given with an enquiry or order.