

BS 8492:2009



BSI Standards Publication

Telecommunications equipment and telecommunications cabling – Code of practice for fire performance and protection

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Summary of pages

This document comprises a front cover, an inside front cover, pages i to ii, pages 1 to 26, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI and came into effect on 30 November 2009. It was prepared by Technical Committee TCT/7, *Telecommunications – Installation requirements*. A list of organizations represented on this committee can be obtained on request to its secretary.

Relationship with other publications

The recommendations of this British Standard are intended to support the requirements specified in BS 6701 relating to the installation, operation and maintenance of telecommunications equipment and telecommunications cabling.

Use of this document

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

Any user claiming compliance with this British Standard is expected to be able to justify any course of action that deviates from its recommendations.

Presentational conventions

The provisions in this standard are presented in roman (i.e. upright) type. Its recommendations are expressed in sentences in which the principal auxiliary verb is “should”.

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.

Introduction

Telecommunications cabling infrastructure includes:

- telecommunications cabling, comprising cables, cords and connecting hardware intended to support the operation of information technology equipment as, or as part of, a telecommunications system;
- closures housing connecting hardware;
- cable management systems housing cables and closures;
- cabinets, frames or racks within which closures may be installed.

The telecommunications equipment connected to the cabling generally requires a power supply, often provided by mains power cabling.

With a few notable exceptions, all materials within the telecommunications cabling infrastructure, equipment and associated mains power cabling are flammable.

When subject to fire conditions, telecommunications cabling presents a specific potential threat because:

- there are specific areas in which the concentration of cabling is very high (such as equipment rooms and telecommunication rooms [see the generic cabling standards in the BS EN 50173 series]) resulting in increased impact of fire in those areas;
- telecommunications cabling is widely distributed throughout buildings within pathways, which create routes for flame spread between areas within the buildings.

The types of pathway within which the cable management systems are installed are, to some extent, influenced by the types of premises and their application. Examples of such influences are shown in Figure 1.

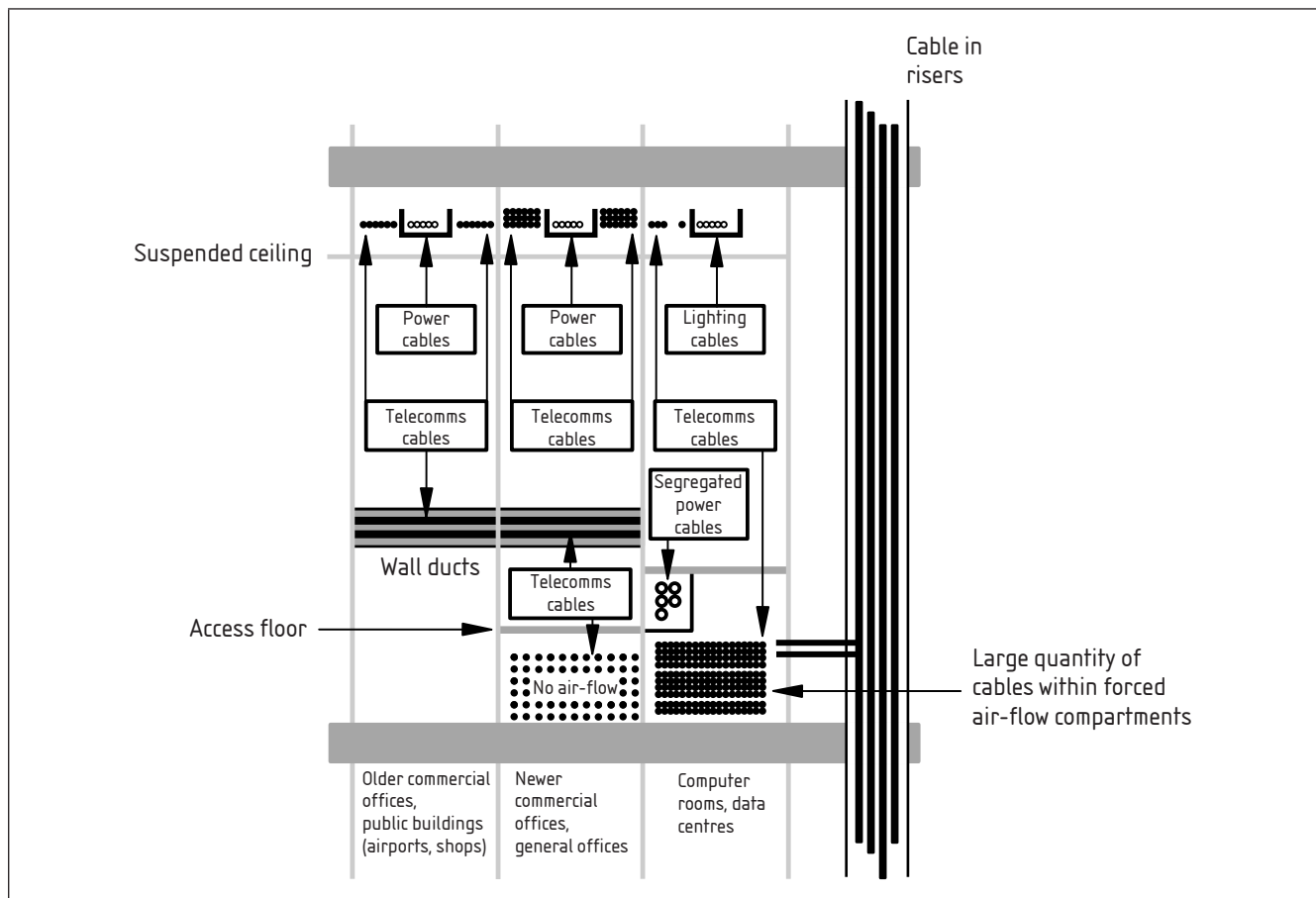
Fire affects both the health of personnel and the functionality of objects within the vicinity of the fire. The nature of premises dictates the comparative risk of these factors. The recommendations given in Clause 4 of this British Standard are based on a holistic or “balanced” approach to the mitigation of fire risk in a range of premises. The recommendations address the risk of ignition, the spread and impact of fire following ignition, taking into account:

- product selection;
- installation of appropriate fire prevention, detection and suppression systems.

Further recommendations relating to component selection are given in Clause 6, which may be implemented in isolation but only when the nature of the building or its occupancy does not allow for the balanced approach to be followed.

The approach to fire safety in the design, management and use of buildings is defined by regulation and described in a number of documents including BS 9999 and the BS 7974 series. BS 8492 is intended to complement these regulations and standards.

Figure 1 Examples of pathways in different types of premises



1 Scope

This British Standard gives recommendations for fire performance and fire protection of all types of telecommunications equipment and telecommunications cabling. It covers:

- designing and implementing cabling infrastructures;
- selecting products, including materials and construction;
- minimizing fire spread;
- increasing safety levels for personnel and property.

This British Standard details the relationship between its recommendations, the usage of premises and fire protection measures.

It is applicable to certain hazardous environments but does not exclude additional requirements which are applicable in particular circumstances, defined, for example, by electrified railways, petrochemical sites, intrinsically safe areas, explosive ordnance storage facilities (bomb dumps).

NOTE Annex A considers the fire hazard posed by the installation of telecommunications equipment and telecommunications cabling infrastructure within premises.

It is expected that this British Standard will be of value to:

- 1) those responsible for specifying infrastructure solutions including:
 - i) premises owners;
 - ii) telecommunications consultants;
- 3) fire authorities;
- 4) those involved in installing fire prevention and protection systems.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 476-20, *Fire tests on building materials and structures – Part 20: Methods for determination of the fire resistance of element of construction (general principles)*

BS 5839-1, *Fire detection and fire alarm systems for buildings – Part 1: Code of practice for system design, installation, commissioning and maintenance*

BS 6266, *Code of practice for fire protection for electronic equipment installations*

BS 6701, *Telecommunications equipment and telecommunications cabling – Specification for installation, operation and maintenance*

BS 7671, *Requirements for electrical installations – IEE Wiring Regulations*

BS EN 1366-3, *Fire resistance tests for service installations – Part 3: Penetration seals*

BS EN 50174 (all parts), *Information technology – Cabling installation*

BS EN 50267-2-1, *Common test methods for cables under fire conditions – Tests on gases evolved during combustion of materials from cables – Part 2-1: Procedures – Determination of the amount of halogen acid gas*

BS EN 50267-2-2, *Common test methods for cables under fire conditions – Tests on gases evolved during combustion of materials from cables – Part 2-2: Procedures – Determination of degree of acidity of gases for materials by measuring pH and conductivity*

BS EN 50310, *Application of equipotential bonding and earthing in buildings with information technology equipment*

BS EN 61034-2, *Measurement of smoke density of cables burning under defined conditions – Part 2: Test procedure and requirements*

BS EN 62305-4, *Protection against lightning – Part 4: Electrical and electronic systems within structures*

BS EN ISO 13943, *Fire safety – Vocabulary*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS 6701, BS EN 50174 (all parts), BS EN ISO 13943, and the following apply.

3.1.1 **compartment**

discrete fire zone designed to contain a fire within that zone

NOTE Compartments are also known as “fire compartments”.

3.1.2 **compartmentation**

division of a premises into compartments in order to provide protection for the rest of the premises

3.1.3 **containment**

use of fire barriers or fire-stopping techniques to maintain the fire performance of defined compartments within the premises

3.1.4 **electric arc**

continuous, luminous discharge of electric current crossing a gap or an insulating surface between two conductors

3.1.5 **electric spark**

transient, luminous discharge of electric current crossing a gap or an insulating surface between two conductors

3.1.6 **plenum**

space where the primary purpose is the movement (typically forced) of air within which mains power cables, telecommunications cables and building services infrastructures can also be installed

3.1.7 **secondary ignition**

ignition of an item or items other than the original burning material

3.1.8 **telecommunications cabling infrastructure**

telecommunications cabling, closures, cable management systems and the cabinets, frames or racks within which closures can be installed

3.1.9 **telecommunications space**

specified volume associated with one or more termination points of telecommunications cabling

3.2 Abbreviations

For the purposes of this British Standard, the abbreviations given in BS 6701, BS EN ISO 13943 and the following apply.

MI	mineral-insulated (cable)
MIMS	mineral-insulated, metal-sheathed (cable)
PTFE	polytetrafluoroethylene
uPVC	unplasticized polyvinylchloride

4 Balanced approach to fire threat mitigation

COMMENTARY ON CLAUSE 4

Clause 4 relates to the management of fire within premises and gives recommendations for the reduction of the risk of fire, and for the mitigation of the effects of fire, by the selection of suitable components and techniques for fire prevention, fire detection and fire suppression.

The recommendations are based upon the consideration of the fire hazard posed by the installation of telecommunications equipment and cabling infrastructure within premises as described in Annex A, which addresses:

- a) ignitability;*
- b) flame spread;*
- c) heat release;*
- d) the production of fire effluent (i.e. smoke, toxic gas and corrosive gas).*

The relative importance of these factors can differ throughout the areas served by the telecommunications cabling and associated infrastructure. Therefore, it is important to note that a single solution covering product selection, and containment, detection and suppression systems might not be appropriate.

4.1 General

The balanced approach to fire threat mitigation detailed in **4.2**, **4.3** and **4.4** should be applied, wherever practicable.

The recommendations of Clause 4 are the primary approach in premises and should be used wherever practicable. Only where the balanced approach in premises is rendered impracticable or deemed inappropriate, owing to the nature of the building or its occupancy, should the recommendations of Clause 6 be considered in isolation.

4.2 Compartmentation within premises

4.2.1 General

Within the premises, compartments should be created that are separated by vertical and horizontal barriers with appropriate levels of fire performance in order to:

- a) prevent the spread of fire and its effluent;
- b) minimize the extent of loss.

The selection of compartment boundaries should take into account the impact of fire within each compartment.

The fire performance of items within each compartment, in combination with the fire detection and suppression systems of the compartment, should:

- 1) reflect the risk to property, personnel and business continuity;
- 2) be selected to satisfy the needs of the premises' owners, landlords, tenants and insurers.

NOTE Guidance on assessing risk is given in **4.2.2.2**.

4.2.2 Risk management

4.2.2.1 Ranking of fire threats

WARNING. In cases where the location and contents of specific compartments remove the need to consider fire threats as described in Table 1, the maintenance of the boundaries of those compartments (i.e. containment) is critical to the fire performance of the premises as a whole.

The fire threats specific to each compartment should be assessed in accordance with Table 1, which gives an indication of the degree of threat mitigation that is necessary in a variety of installations.

Table 1 Ranking of fire threats

Ranking	General installations (see 4.4.2)	Installations where evacuation of personnel is critical (see 4.4.3)	Installations where protection of equipment is critical (see 4.4.4)
Most important 	Resistance to ignition	Resistance to ignition	Resistance to ignition
	Flame spread	Impact: Effluent: Smoke	Impact: Effluent: Corrosive gas
	Impact: Effluent: Smoke	Flame spread	Flame spread
	Impact: Effluent: Corrosive gas	Impact: Effluent: Toxic gas	Impact: Effluent: Smoke
Least important	Impact: Effluent: Toxic gas	Impact: Effluent: Corrosive gas	Impact: Effluent: Toxic gas

NOTE This table has been adapted from PD IEC/TR 62222:2005, Table 2.

4.2.2.2 Risk assessment and business continuity analysis

A risk assessment should be carried out for each compartment which takes account of the following:

- a) architectural considerations;
- b) the fabric and contents of the compartment and building;
- c) the requirements of the owners, landlords, tenants and insurers, including for example;
 - 1) protection of the building and its personnel;
 - 2) business continuity;
 - 3) aesthetics and finish;
 - 4) electrical and optical performance of the cabling system.

Where appropriate, business continuity analysis should also be applied.

NOTE Recommendations for risk management are given in BS 31100. For guidance on business continuity, see BS 25999.