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Code of practice for the operation of fire protection measures

Part 4: Actuation of release mechanisms for doors

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Foreword

Publishing information

This part of BS 7273 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 June 2015. It was prepared by Technical Committee FSH/12, *Fire detection and alarm systems*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This part of BS 7273 supersedes BS 7273-4:2015, which is withdrawn.

Relationship with other publications

BS 7273 is published in five parts:

- Part 1: *Electrical actuation of gaseous total flooding extinguishing systems*;
- Part 2: *Mechanical actuation of gaseous total flooding and local application extinguishing systems*;
- Part 3: *Electrical actuation of pre-action watermist and sprinkler systems*;
- Part 4 (this part): *Actuation of release mechanisms for doors*;
- Part 5: *Electrical actuation of watermist systems (except pre-action systems)*.

Recommendations for the design, installation, commissioning and maintenance of fire detection and fire alarm systems are given in BS 5839-1. In order to conform to this part of BS 7273, such systems are, for the most part, expected to conform to BS 5839-1. However, some of the recommendations given in BS 5839-1 (e.g. in respect of provision and siting of fire detectors) are modified by recommendations given in this part of BS 7273. Where this is the case, the recommendations given in this part of BS 7273 take precedence for the purposes of actuation of door release mechanisms.

Information about this document

This is a full revision of the standard and introduces the following principal changes:

- To make the standard more straightforward to use and the recommendations more succinct, the text has been shortened and simplified; some of the commentary has been moved to new informative annexes and some of the previous text has been tabulated e.g. a new Table 1 has been introduced, which, for all three categories of actuation, describes and contrasts the conditions under which the interface with a door release mechanism is fail-safe.
- The diagrams relating to the location of smoke detectors in relation to electrically held-open fire doors have been revised. This is intended to make the recommendations clearer and to remove possible confusion where a single diagram has been used to convey several principles applying to detector siting and spacing.
- There have been changes in terminology to assist users of the standard. The designations, A, B and C for categories of actuation are now referred to as ‘Critical’, ‘Standard’ and ‘Indirect’. These better describe the suitability of the different categories of actuation in relation to particular applications.
- The guidance in BS 7273-4:2007, Annex A of the previous standard is now normative and, therefore, the standard includes recommendations (in tables in Annex B of this version) as to which category of actuation is appropriate for a particular application.

Text introduced by or altered by Amendment No. 1 is indicated in the text by tags ▌A1⟩ ⟨A1▌. Minor editorial corrections are not tagged.

Use of this document

As a code of practice, this part of BS 7273 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 part of BS 7273 is expected to be able to justify any course of action that deviates from its recommendations.

Presentational conventions

The provisions of 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.

The word "should" is used to express recommendations of this standard. The word "may" is used in the text to express permissibility, e.g. as an alternative to the primary recommendation of the Clause. The word "can" is used to express possibility, e.g. a consequence of an action or an event.

Notes and commentaries are provided throughout the text of this standard. Notes give references and additional information that are important but do not form part of the recommendations. Commentaries give background information.

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

It is commonplace for there to be an interface(s) between a fire detection and fire alarm system and various forms of door hardware. The devices actuated by the arrangements described in this part of BS 7273 are frequently used, in the event of fire, to open, release, or unlock doors that form part of the means of escape in the event of fire, or that prevent the spread of smoke and fire into escape routes. Their use might also be required to make buildings, and circulation routes within buildings, accessible for some groups of people, such as those with certain forms of disability.

Typically, the facilities with which it is often necessary to interface the fire detection and fire alarm system comprise of:

a) devices to hold open self-closing fire-resisting doors (e.g. electromagnetic, and acoustically and/or radio-actuated, hold-open devices);

b) devices to secure doors on means of escape (e.g. electromagnetically held locking devices and solenoid-operated locks);

c) powered sliding doors on means of escape, which might be required to open permanently on operation of the fire detection and fire alarm system.

Applications for these facilities are discussed in Annex A. In this standard, the generic term "release mechanism" (see **3.32**) is used to describe the devices or arrangements described in a) to c).

It is essential that the actuation of the door hardware occurs reliably, as a failure to operate might seriously impede the escape of people from fire by, for example, failing to unlock fire exit doors, or by permitting spread of fire or smoke into escape routes. Failure of electronically secured doors to open in the event of fire can also hamper fire-fighting and rescue operations by the fire and rescue service.

There is often an assumption that the arrangements for actuation of the devices and facilities to which this standard refers will be fail-safe. The assumption is made that, in the event of a failure of the fire detection and fire alarm system, doors will be released. This cannot always be assured. For example, if the power supply to an electromagnet fails, the electromagnet will cease to operate, mirroring the situation required in the event of fire.

However, on total failure of the main and standby power supplies to the control and indicating equipment (CIE), the power supply to the electromagnet might not necessarily be interrupted, because the supply to the electromagnet can be independent of the supply to the CIE.

No fire protection equipment or facility is totally immune to failure. The level of reliability of the actuation arrangements needs to be commensurate with the risk to people in the event of fire and simultaneous failure of the actuation arrangements to operate (see Clause **4**).

In specifying measures for the interface between door release mechanisms and fire detection and fire alarm systems this standard takes into account the risk to occupants:

1) if the facilities fail to operate in the event of operation of the fire detection and fire alarm system; and

2) if actuation of release mechanisms occurs as a result of events other than fire.

In the case of 2), account might also need to be taken of the risk to persons other than occupants (e.g. the general public). In the case of electronically secured doors, this British Standard assumes that the only means of releasing the locks is the electronic arrangement, and that there is no provision for mechanical release of locks by building occupants (e.g. by means of a thumb-turn or handle). Where such mechanical means of releasing locks is provided, the full application of all recommendations in this part of BS 7273 might not be necessary.

NOTE A1 *In blocks of flats, it is common for electronic locking to be fitted to the main entrance doors to the blocks. As a result of modern purpose-built blocks of flats having a "stay-put" strategy, there is normally no fire detection and fire alarm system with which electronic locking can be interfaced. To facilitate means of escape from the block, the electronic locking is released either by mechanical means (e.g. a lever handle), or by a manual release control that is used for normal egress (e.g. a mushroom head push-button); in the latter case, a further manual release control conforming to the recommendations of sub-clause* ***11.2*** *of this British Standard is provided for emergency use. As, in such cases, there is no fire detection and fire alarm system, the electronic locking is outside the scope of this Part of BS 7273.*

However, attention is drawn to BS 8220-1, which recommends that, in medium and high-rise blocks of dwellings (i.e. dwellings within a block of flats), where electric strikes or magnets are installed, they need to be fail safe (open) devices in the event of simultaneous failure of the normal, and any standby, power supply. This also enhances the reliability of access to the block by the fire and rescue service, for whom a facility for access (e.g. a "drop key" facility) is normally provided. This is not a requirement of either building regulations (in relation to new buildings) or fire safety legislation relevant to existing buildings (given that the entrance door to the block could, otherwise, be locked with a mechanical lock, operated by an "easy opening device", such as a lever handle, on the inside, and by a key that would not be held by the fire and rescue service on the outside).

However, provision of "fail-safe to open" is good practice, in that it capitalizes on the provision of electronic locking by facilitating easy access to the block for the fire and rescue service. Equally, the latter facility might impact on the security of the block because the access facility for the fire and rescue service is commonly operated by a key (e.g. a "drop key") that is readily available to members of the public and, hence, criminals. A1

Throughout the United Kingdom, adequate means of escape in the event of fire, and adequate access to buildings, are required under the relevant national building regulations: the Building Regulations 2010 [1], the Building Regulations (Northern Ireland) 2012 [2], and the Building (Scotland) Regulations 2004 [3] and subsequent amendments. Building regulations apply to new building work including, amongst other things, material alterations to means of escape in the event of fire in virtually all existing buildings. Accordingly, approval to fit devices actuated by the arrangements described in this part of BS 7273 might need approval by the relevant building control body.

In England and Wales, adequate means of escape in the event of fire in existing buildings are required under the Regulatory Reform (Fire Safety) Order 2005 [4]. Guidance on this legislation in England and Wales, including the use of release mechanisms for doors, is published by the Department for Communities and Local Government (www.gov.uk). Similar requirements are imposed by equivalent legislation in Scotland[1)] and Northern Ireland[2)]. In each case, the legislation requires that fire precautions, including provisions relating to means of escape, be based on a fire risk assessment. Throughout Great Britain, the Equality Act 2010 [9], and similar legislation in Northern Ireland, requires that, in most buildings, reasonable adjustments to the physical features of premises are carried out to overcome physical barriers to access. Certain devices actuated by the arrangements described in this part of BS 7273 are used to overcome such physical barriers.

Although this part of BS 7273 gives recommendations for the design of the interface between a fire detection and fire alarm system and devices that open, unlock or release doors in the event of fire, this does not necessarily mean that such devices will be acceptable (e.g. under legislation) in all circumstances in all premises. Guidance on this matter can be found in the guidance documents that support legislation and in other relevant British Standards. Often, the acceptability of the devices, and of the type of device used, will be determined by a risk assessment carried out by a competent person. Building control bodies and fire and rescue authorities can give advice in particular circumstances.

1) The Fire (Scotland) Act 2005 [5] and the Fire Safety (Scotland) Regulations 2006 [6]. Guidance on the Scottish legislation is published by Scottish Government (www.scotland.gov.uk).

2) The Fire and Rescue Services (Northern Ireland) Order 2006 [7] and Fire Safety Regulations (Northern Ireland) 2010 [8]. Guidance on the legislation in Northern Ireland is published by Department of Health, Social Services and Public Safety (dhsspsni.gov.uk).

1 Scope

This part of BS 7273 gives recommendations for the design, installation, commissioning and maintenance of electrical control arrangements for actuation of mechanisms that unlock, release or open doors in the event of fire. It applies to all aspects of the interface between these mechanisms and a fire detection and fire alarm system, including interfaces that incorporate acoustic coupling and radio transmission. It does not recommend whether the above mechanisms should, or should not, be used in any given premises, or in any particular circumstances.

The interface arrangements to which this part of BS 7273 applies, include any such arrangements that are designed in the event of fire to:

a) release fire-resisting doors that are normally held in the open position;

b) unlock doors that are normally locked; or

c) cause powered sliding doors to open.

〈A1〉 This British Standard does not apply to electrically controlled systems that form part of a smoke venting system.

NOTE 1 Recommendations for the interface between these systems and a fire detection and fire alarm system are given in BS 7273-6. 〈A1〉

This part of BS 7273 does not generally apply to the equipment that holds, releases, locks or unlocks the doors, or that facilitates the opening of powered sliding doors.

NOTE 2 Recommendations are given, where appropriate, for the standards to which some of this equipment needs to conform.

This part of BS 7273 does not apply to products used within the fire detection and fire alarm system that initiate the signal to actuate the door locking or release mechanisms, nor to aspects of the fire detection and fire alarm system concerned with its primary function to give warning in the event of fire.

NOTE 3 Recommendations for the design, installation, commissioning and maintenance of fire detection and fire alarm systems are given in BS 5839-1, which refers normatively to BS 7273 for the interface between a fire detection and fire alarm system and other fire protection systems and equipment.

The scope of this part of BS 7273 is shown diagrammatically in Figure 1.

