Key to understanding this document

Red = Safety (or presence detection)

Blue = Motion detection (door activation)

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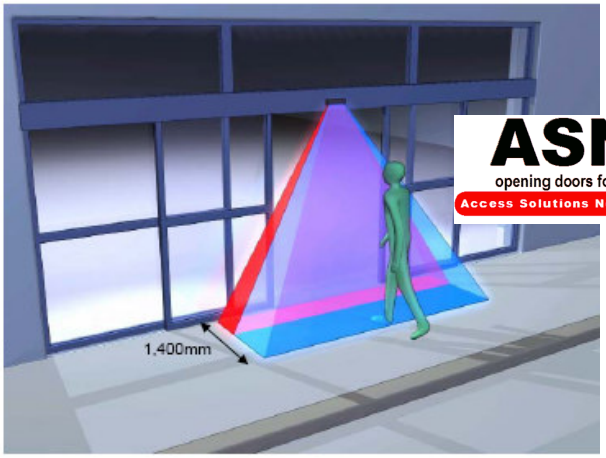
BS7036 Activation Sensors for Sliding Doors

Motion Detection for Sliding Doors

Automatic activation devices should be positioned to ensure that, where practicable, the edge of the detection zone where activation is initiated is a minimum of 1400 mm from the door.



Motion Device Verification

1 Test sensors by walking towards the door opening. The door should start to open when a person is approximately 1,400 mm (5 ft) from the door. The door should slide smoothly to the open position and stop without impact.

2 Step out of the activation zone. After a time delay (normally 1 s to 5 s) the door should close smoothly.

3 Repeat 1 and 2 on the other side of the opening if the door has two-way operation

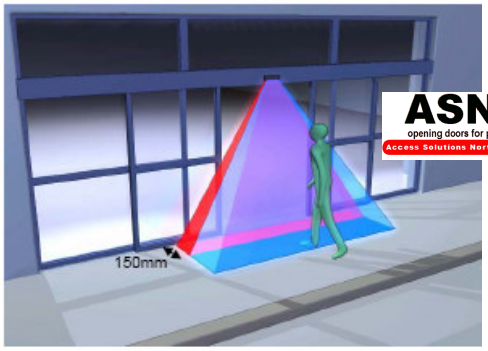
For motion sensing devices, testing is achieved by the tester approaching the door from several directions in turn.

Safety during the closing cycle

Various devices are available to protect the threshold area by preventing a door from closing whilst the area is occupied. These include presence sensing devices, hold-open beams or safety mats. Test these devices as follows:

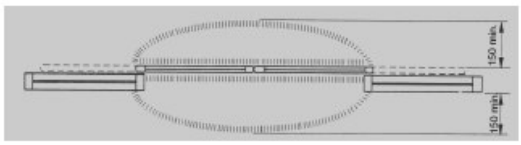
a) *Presence sensing devices.* If presence sensing devices are fitted, place the test object within 150 mm of the plane of movement of the door (but not interrupting any hold-open beam) and verify that the door remains open for a minimum of 30 s. After a minimum of 30 s it is allowable for the doors to close.

b) *Hold-open beams.* If hold-open beams are fitted, place the test object on the threshold and verify that the door remains open.



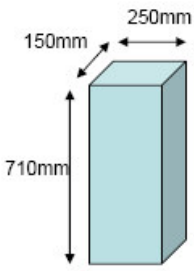
Extra Presence Detection for Sliding Doors

Where assessment indicates that a significant portion of the traffic using main entrance/exit doors is potentially vulnerable (e.g. elderly, infirm, disabled or very young) then it is essential that additional presence sensing safety devices covering the threshold of the door and cover a detection area as shown below



Presence Timer

Presence sensors should detect stationary traffic for 30 s minimum. If further movement of traffic occurs and the traffic remains within the detection zone, then the door should remain open for an additional 30 s minimum.



BS Test Object

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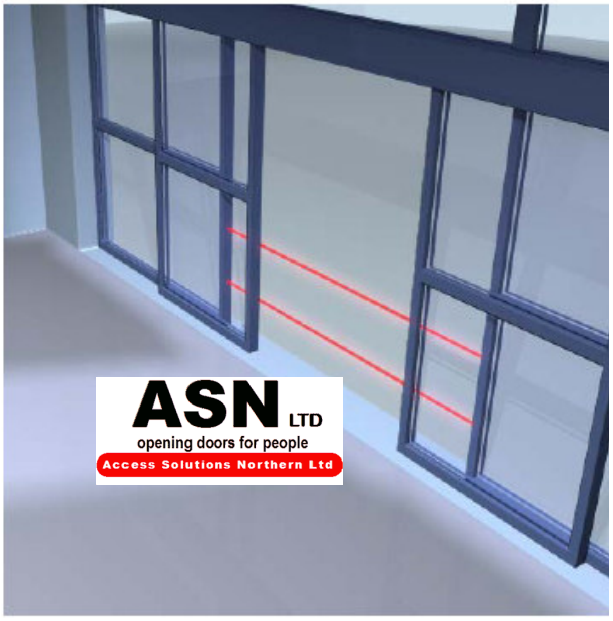
Beam Positions

A hold-open beam positioned between the jambs at a height between 300 mm and 600 mm above the finished floor level. The beam should be connected such that traffic interrupting the beam causes the door to remain fully open, or to reopen if it is in its closing cycle.



Side Screen Safety

Where practicable, one of the following should be fitted.

- A suitable barrier
- A pocket screen of minimum height 1,500 mm measured from finished floor level so that a pocket is formed into which the door slides
- Presence sensors protecting the area through which the doors travel during their opening cycle, such that the doors (if activated) open at search speed, or give an audible warning, when traffic is detected.

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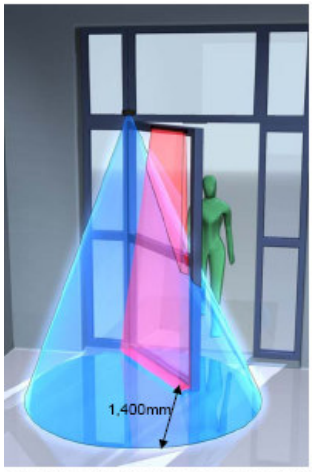
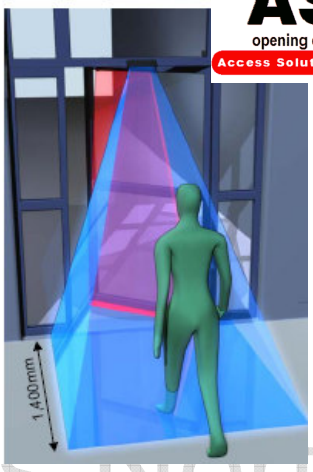
BS 7036 Health and safety at powered doors for pedestrian use

BS7036 Activation Sensors for Swing Doors



Motion Detection for Swing Doors

Automatic activation devices should be positioned to ensure that, where practicable, the edge of the detection zone where activation is initiated should be as follows:
a) 1400 mm from the door, measured perpendicular to the plane of the closed door, when the door opens away from the user;
b) 1400 mm from the leading edge of the door in the fully open position when the door opens towards the user.



Test activation sensor as follows.

a) For a door opening away from the user, test sensors by walking towards the door opening. The door should start to open when a person is approximately 1400 mm from the door. The door should swing smoothly to the open position and stop without impact.
b) For a door opening towards the user, the door should start to open when a person is approximately 1400 mm plus the width of the door leaf from the door.
2 Step out of the detection zone. After a time delay (normally 1 s to 5 s) the door should close smoothly.
3 Repeat 1 and 2 on the other side of the opening if the door has two-way operation.

Permitted Safety Devices on Swing Doors

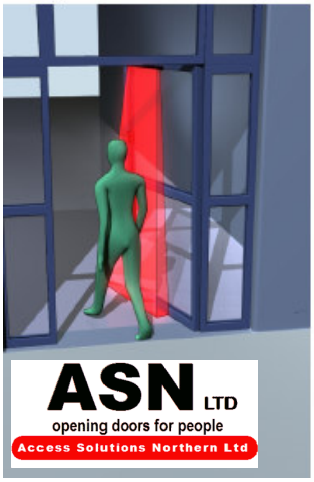
a) Presence sensing device which interrupts door movement at any point during its cycle
b) Presence sensing device or safety mat which gives limited protection by preventing a fully open or fully closed door from moving.
Item b above should only be considered where the Hazard Analysis and Risk Assessment indicates that the risk is low.

Test Safety Sensor as follows

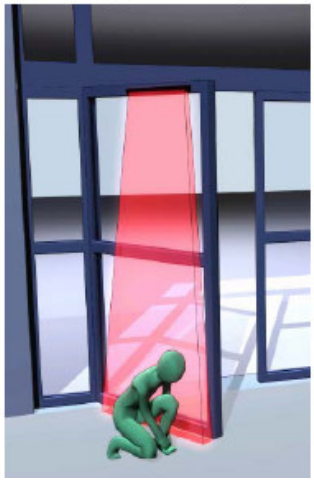
1. With the door in the closed position, place the test object in the swept area of the doors, activate the door and verify that the door starts to open but stops before striking the test object.

2. Activate the door to the open position. Place the test object as in 1 above and check that the door starts to close but stops before striking the object.

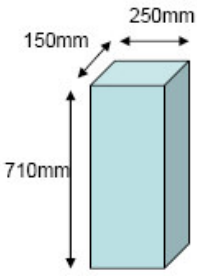
Approach Side Safety



Swing Side Safety



BS Test Object



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1 Finger traps

During the opening and closing cycle of a swing or balanced door, a potential finger trap is created by the construction, the position of the pivot point, or by other features. Such hazards should be overcome by the installation of a finger guard that either fills the finger trap or minimizes the gap so as not to create a finger trap Particular attention should be directed to manual doors that are proposed for conversion to power operation.

Low energy swing doors have two main methods of operation as follows:

a) power assisted operation in which the initiating signal is provided by the action of pushing, pulling or touching the door leaf or handle; or

b) power operation in which the initiating signal is provided by a manual or automatic activation device.

NOTE 2. Low energy swing doors are generally not fitted with safety devices because the kinetic energy levels are not considered to be dangerous. However, installation of low energy swing doors should only be considered where the Hazard Analysis and Risk Assessment (see **4.1.4** of Part 1) has taken account of elderly, frail and disabled users and indicates that the risk to these users is low.

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5 Safety during the opening and closing cycle

5.1 Provision should be made to protect traffic occupying the swept area.

5.2 The powered door operator should be so designed that forces caused by the door leaf impacting the human body, or part of it, are limited to safe values.

NOTE. The potential for causing injury is defined by the mass of the door and its speed of movement i.e. its kinetic energy. See annex C for minimum opening and closing times for a range of door masses.

Therefore, to keep the force of impact to a safe level, the speed of a low energy swing door should be adjusted so that the kinetic energy of the door does not exceed the values given in table 1 of Part 1 at any point in the opening or closing cycle.

5.3 The maximum static entrapment force should not exceed 67 N when applied 25 mm from the leading or meeting stile of the door at any point in the opening or closing cycle.

5.4 If the Hazard Analysis and Risk Assessment identifies that any contact with the user is unacceptable then a presence sensing safety device (see **8.3** of Part 1) or safety mat (see **8.2.2** of Part 1) should be fitted.

NOTE. A safety mat gives limited protection by preventing a fully open or fully closed door from moving.

If door kinetic energy is too high then safety sensors should be used

Hotron Touch Switches in Hardwired or Radio Controlled format

Hotron Non-Touch Switches

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Finger Protectorers

Potential finger trap hazard
This is created when the door is in motion

A potential finger trap hazard is created when a door is in motion. Newly fitted aluminium doors should have a special anti finger trap stile built into the door, but older doors will probably not have these.

All doors open to public use should have them fitted but these are not required on manual doors.

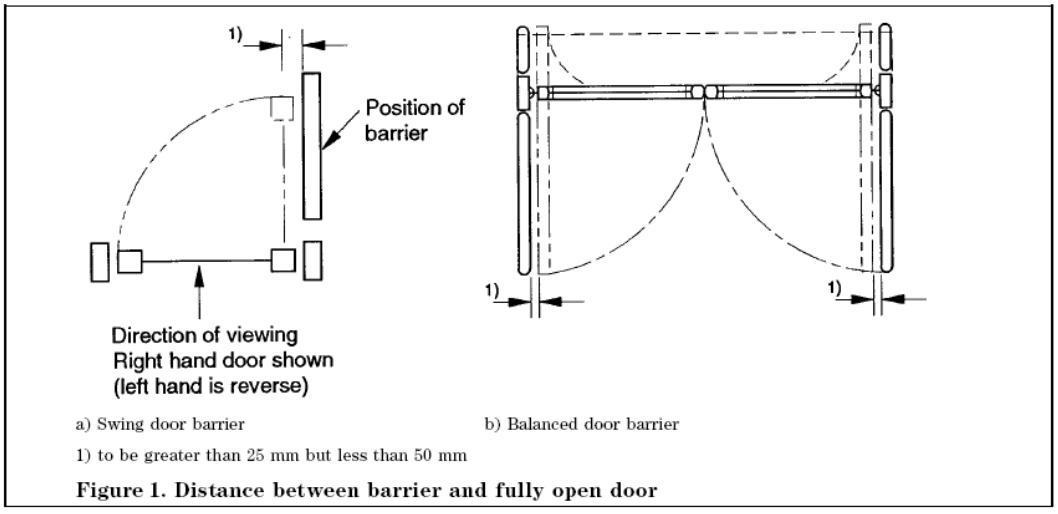
Automatic doors must have these fitted to comply with the BS7036 automatic door safety regulations. The style of guard will depend on the type of door being fitted to.

Barriers for Swing Doors

If the opening face of a swing door can be approached from the sides then a suitable barrier must be fitted to compliance with the BS7036 Health and safety regulations. This is to divert traffic away from the leading edge of the door on to a straight approach to the door.

These barriers have to conform to certain specifications and criteria in construction and stability.

Diagram shows position of barrier this is a physical feature and not an electronic device



a) Swing door barrier

b) Balanced door barrier

1) to be greater than 25 mm but less than 50 mm

Figure 1. Distance between barrier and fully open door

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Regarding Door handles please see bellow exert from the BS7036 Health and safety regulations

BS 7036 : Part 1 : 1996

4.1.6 There should be no attachments to, or devices incorporated into, powered doors or adjacent areas that would create a potential hazard.

NOTE. Such devices include letter boxes, letter flaps, handles.

5 Safety during the opening cycle

5.1 Provision should be made to deter persons from occupying the area through which the door travels during its opening cycle.

5.2 A keep clear sign should be affixed to the screen or wall across which the door travels (see **11.3** of Part 1).

5.3 Where practicable, one of the following should be fitted.

NOTE Barriers and screens are not suitable for use with telescopic sliding doors as they introduce serious trapping hazards.

a) A suitable barrier (see Figure 1 of this Part and clause **9** of Part 1). For folding doors, if they can be approached in the open position from the side, then a barrier should be installed along the line of the door leaf in its open position. The distance between the barrier and the fully open door should be greater than 25 mm and less than 100 mm (see Figure 2).

b) A pocket screen of minimum height 1 500 mm measured from finished floor level so that a pocket is formed into which the door slides (see Figure 3 and clause **6**).

c) Presence sensors (see **8.3** of Part 1) protecting the area through which the doors travel during their opening cycle, such that the doors (if activated) open at search speed, or give an audible warning, when traffic is detected.

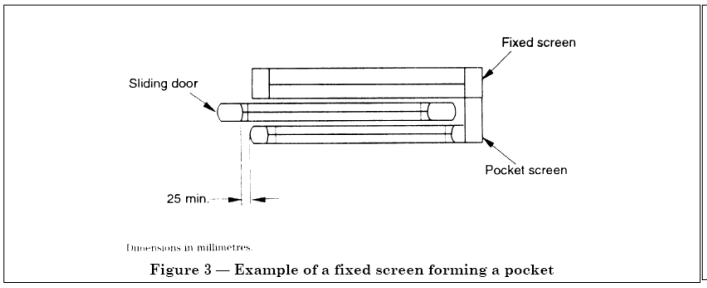


Figure 3 — Example of a fixed screen forming a pocket

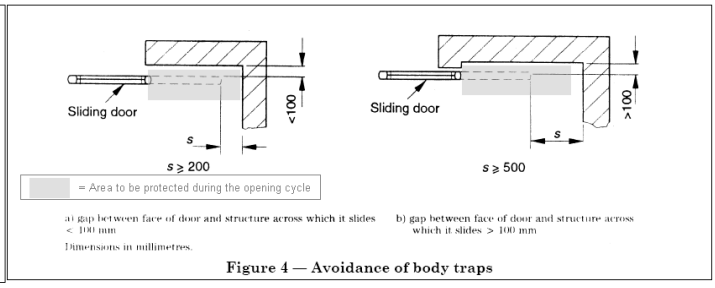
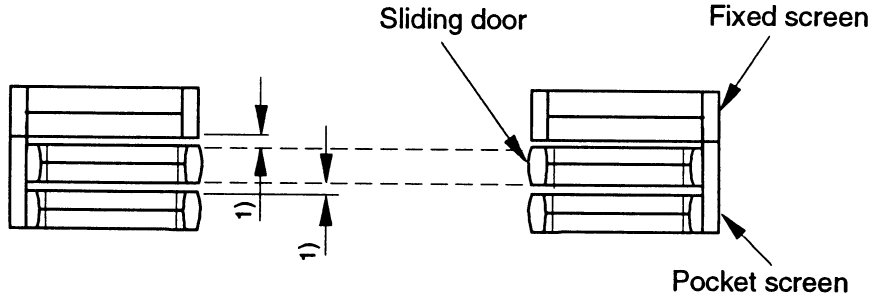


Figure 4 — Avoidance of body traps



Dimension 1) greater than 25 mm or less than 6 mm.

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