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Active fire curtain barrier assemblies

Part 1: Specification

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Foreword

Publishing information

This part of BS 8524 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 November 2025. It was prepared by Technical Committee FSH/25, *Smoke, heat control systems and components*. A list of organizations represented on this committee can be obtained on request to the committee manager.

Supersession

This part of BS 8524 supersedes [BS 8524-1:2013](#), which is withdrawn.

Relationship with other publications

BS 8524 is published in the following parts:

- Part 1: *Specification*;
- Part 2: *Code of practice for application, installation and maintenance*.

[BS 8524-2](#) gives guidance on specifying, installing and maintaining active fire curtain barrier assemblies, with recommendations for different assembly applications, wiring, power supplies and the emergency egress control.

Information about this document

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

- side retention has been updated with a supporting figure;
- references to [ISO 21524:2021](#) and [BS EN 15269-11:2018](#) have been included;
- barrier types have been updated to reflect market supply;
- pressure and impact testing has been updated to force gauge methodology;
- horizontal and angle barriers have been included with supporting text and figures;
- durability of self-closing levels has been updated;
- reaction to fire to be classified to [BS EN 13501-1:2018](#) has been included and national requirements for Class 0 or Class 1 have been deleted;
- [Annex A](#) (previously Annex D) has been updated to strengthen gravity fail-safe testing procedures; and
- [Annex D](#) (previously Annex G) has been updated to clarify time/temperature criteria.

Product testing. Users of this part of BS 8524 are advised to consider the desirability of third-party testing of product conformity with this part of BS 8524. Users seeking assistance in identifying appropriate conformity assessment bodies or schemes may ask BSI to forward their enquiries to the relevant association.

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Where websites and webpages have been cited, they are provided for ease of reference and are correct at the time of publication. The location of a webpage or website, or its contents, cannot be guaranteed.

Use of this document

It has been assumed in the preparation of this part of BS 8524 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 document 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.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. “organization” rather than “organisation”).

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

In particular, attention is drawn to UK legal duties under health and safety law to prevent hazards from uncontrolled descent.

0 Introduction

0.1 Role and use of barrier assemblies

As fire-separating elements, barrier assemblies are required to provide the following main functions:

- a) to maintain any compartmentation of buildings needed to limit the spread of fire and smoke; and
- b) to allow access to protected escape routes, both vertical and horizontal, without any loss of fire resistance, and to limit smoke entry into these routes, i.e. protected corridors and protected shafts.

They can also be partially deployed to control the movement of fire effluent within buildings in the event of fire, prior to being fully deployed as a fire barrier.

Recommended positions and ratings for fire-separating elements for means of escape purposes are given in [BS 9999](#), [BS 9991](#) and [BS 7974](#). The recommendations in [BS 9999](#) and [BS 9991](#) use a risk-based approach; those in [BS 7974](#) are based on the principles of fire safety engineering.

When used as part of a fire-engineered design solution, barrier assemblies can become a critical element of that design. If barrier assemblies do not deploy to their operational position, the fire-engineered design solution would be compromised. Therefore, in the event that other fire protection systems or elements do not function, e.g. due to total power failure, the barriers are still expected to deploy to their fire-operational position to provide fire separation.

0.2 Application of barrier assemblies

Barrier assemblies used in life safety and property protection applications can be horizontal, vertical or angled. Depending upon the application, barrier assemblies can be used to replace fire doors, roller shutters, non-loadbearing walls, non-loadbearing ceilings, glazed elements, etc. They can also be used to form fire separation, e.g. forming protected routes or lobbies. When barrier assemblies are used only for fire and smoke control and a lobby is also provided, then different parameters apply, i.e. a single barrier assembly cannot be used to replace a lobby and two doors (see [BS 9999](#) and [BS 9991](#)). Barrier assemblies can enable greater barrier widths and barrier movements using less space than other traditional methods. Recommendations on the suitability, selection, installation and maintenance of barrier assemblies are given in [BS 8524-2](#).

0.3 Deployment of barrier assemblies

Some examples of how barrier assemblies could be deployed are:

- a) barriers deploy fully upon receipt of a signal from the fire alarm system;
- b) barriers remain retracted when the fire alarm system is activated and only deploy upon receipt of a signal from a local smoke/heat detector. In these circumstances, the only barrier assemblies to deploy are those where fire or smoke are in the vicinity;
- c) barriers deploy upon local thermal activation, e.g. upon parting of a fusible link;
- d) barriers remain retracted when the fire alarm system is activated for a predetermined time to allow for evacuation before deploying fully;
- e) barriers move to a given height above finished floor level when the fire alarm system is activated to contain smoke for a predetermined time before closing fully for fire containment;
- f) barriers move to a given height above finished floor level when a specific fire alarm system signal is provided, to contain smoke when the fire location is such that the barrier assembly is not required to deploy fully; and
- g) barriers deploy on loss of primary and auxiliary power supply.

NOTE Further information on the deployment of barrier assemblies is given in [BS 8524-2](#).

0.4 Heat transfer through barrier assemblies

In fire safety situations, it is often important to establish the heat transfer from one side of the separating element to the other in order to calculate escape route sizes and safe operating distances. Traditionally, for other product types, this has been established using insulation data; it is now accepted that insulation performance can be difficult to measure and achieve for barrier assemblies, and the use of radiation data is therefore also appropriate.

NOTE Further information on the application of radiation test data is given in [BS 8524-2](#).

1 Scope

This part of BS 8524 specifies requirements for the design, testing and classification of active fire curtain barrier assemblies, for installation in accordance with [BS 8524-2](#). It covers the reliability and durability, fire resistance, smoke containment and force gauge resistance performance of the active fire curtain barrier assemblies, their control devices and ancillary equipment.

The requirements within this part of BS 8524 are applicable to active fire curtain barrier assemblies of any material that are designed to provide fire resistance in most end-use applications.

This document does not apply to the following end-use applications:

- barriers made of part of the building's structure;
- theatre/proscenium textile curtains, for which requirements are given in [BS 5867-1](#);
- fabrics for curtains, drapes and window blinds, for which requirements are given in [BS 5867-1](#) and [BS 5867-2](#);
- smoke barriers, for which requirements are given in [BS EN 12101-1](#); and
- operable fabric curtains when used in retail applications to provide pedestrian access, for which requirements are given in [BS EN 16034](#).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions, or limits the application, of this document¹⁾. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

[BS 476-22](#), *Fire tests on building materials and structures – Part 22: Methods for determination of the fire resistance of non-loadbearing elements of construction*

[BS 476-31.1](#), *Fire tests on building materials and structures – Part 31: Methods for measuring smoke penetration through doorsets and shutter assemblies – Section 1: Method of measurement under ambient temperature conditions*

[BS 8524-2](#), *Active fire curtain barrier assemblies – Part 2: Code of practice for application, installation and maintenance*²⁾

[BS 9999](#), *Fire safety in the design, management and use of buildings – Code of practice*³⁾

[BS EN 54](#) (all parts), *Fire detection and fire alarm systems*

[BS EN 1363-1](#), *Fire resistance tests – Part 1: General requirements*

[BS EN 1363-2](#), *Fire resistance tests – Part 2: Alternative and additional procedures*

[BS EN 1366-7](#), *Fire resistance tests for service installations – Part 7: Conveyor systems and their closures*

[BS EN 1634-1:2014+A1:2018](#), *Fire resistance and smoke control tests for door, shutter assemblies and openable windows and elements of building hardware – Part 1: Fire resistance test for doors and shutter assemblies and openable windows*

[BS EN 1634-3:2004](#), *Fire resistance and smoke control tests for door and shutter assemblies, openable windows and elements of building hardware – Part 3: Smoke control test for door and shutter assemblies*

¹⁾ Documents that are referred to solely in an informative manner are listed in the Bibliography.

²⁾ This document also gives informative references to [BS 8524-2:2025](#).

³⁾ This document also gives informative references to [BS 9999:2017](#).

- [BS EN 12453:2017+A1:2021](#), *Industrial, commercial and garage doors and gates – Safety in use of power operated doors – Requirements and test methods*
- [BS EN 13501-1:2018](#), *Fire classification of construction products and building elements – Part 1: Classification using data from reaction to fire tests*
- [BS EN 13501-2:2023](#), *Fire classification of construction products and building elements – Part 2: Classification using data from fire resistance and/or smoke control tests, excluding ventilation services*
- [BS EN 13823](#), *Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by a single burning item*
- [BS EN 15269-11:2018](#), *Extended application of test results for fire resistance and/or smoke control for door, shutter and openable window assemblies, including their elements of building hardware – Part 11: Fire resistance for operable fabric curtains*
- [BS EN ISO 1182](#), *Reaction to fire tests for products – Non-combustibility test*
- [BS EN ISO 1716](#), *Reaction to fire tests for products – Determination of the gross heat of combustion (calorific value)*
- [BS EN ISO 13943](#), *Fire safety – Vocabulary*
- [BS ISO 3009](#), *Fire resistance tests – Elements of building construction – Glazed elements*
- [ISO 21524:2021](#), *Fire resistance tests – Elements of building construction – Requirements for active fire curtains*

3 Terms and definitions

For the purposes of this part of BS 8524, the terms and definitions given in [BS EN 13501-1:2018](#), [BS EN ISO 13943](#) and the following apply.

3.1 active fire curtain barrier assembly (barrier assembly)

assembly manufactured from flexible materials, not hinged or pivoted, provided for the passage of persons, air and objects, which, together with its frame as installed in a building, is intended (when closed) to resist the passage of fire

NOTE For ease of reference, the active fire curtain barrier assembly is referred to hereinafter as the “barrier assembly”.

3.2 barrier assembly with smoke resistance performance

assembly manufactured from flexible materials, not hinged or pivoted, provided for the passage of persons, air and objects, which, together with its frame as installed in a building, is intended (when closed) to resist the passage of fire and smoke

3.3 barrier movement

travel distance of a barrier assembly from its retracted position to its fire-operational position

3.4 compartmentation

process of separating a building or part of a building into one or more rooms, spaces or storeys, with the intention of preventing the spread of fire to or from another part of the same building or adjoining building

NOTE 1 Compartmentation is mainly implemented to assist the fire and rescue services by confining the fire within a fire-resisting enclosure. In some instances, it is employed to assist means of escape in buildings where evacuation might be delayed, e.g. where phased evacuation policy has been applied in premises such as hospitals and care homes or where a policy of non-evacuation (e.g. “defend in place” or “stay put strategy”) is employed as in blocks of flats.

NOTE 2 Fire enclosures specifically for the purpose of means of escape, such as lobby protection to stairways and enclosure of special risks, are not regarded as compartments and can employ passive smoke containment measures.

3.5 deployment

movement of a barrier assembly from its retracted position to its fire-operational position

3.6 fire-operational position

final configuration of a barrier assembly specified by its designer to achieve and be sustained in the ultimate fire condition of the design

3.7 fire separation

method of providing an element that is intended for use in maintaining separation between two adjacent areas of a building in the event of a fire to form protected routes and/or compartmentation

3.8 fire and rescue service override switch

manually operated switch to enable firefighters to initiate or terminate the operation of a fire safety system or other device

3.9 fusible link

device that releases a component such as a fire damper or fire shutter at a set temperature

NOTE This usually incorporates either a solder link or a frangible glass bulb.

[SOURCE: BS 9999:2017, 3.62, modified – note has been changed]

3.10 gravity fail-safe

ability of a barrier assembly to move to its fire-operational position in a safe and controlled manner to facilitate fire separation when all consumable primary and auxiliary power supplies are removed, in the event of wiring or system corruption, open or short circuit, or any combination thereof

3.11 hold-open device

element of the hold-open system that allows a gravity fail-safe barrier assembly to remain open either at a pre-set or chosen position until released

3.12 means of escape

means whereby a safe route (or routes) in the event of fire is (or are) provided for persons to travel from any point in a building to a place of ultimate safety

[SOURCE: BS 9999:2017, 3.76]

3.13 multi-positional deployment

staged movement of barrier assemblies to provide initial smoke containment prior to full fire containment

3.14 side retention

retention device which links the barrier fabric to the building structure to contain fire and smoke

3.15 smoke barrier

device to channel, control and/or prevent the migration of smoke

NOTE Smoke is often referred to as “fire effluent”. Smoke barriers can also be referred to as smoke curtains, smoke blinds or smoke screens. These are specified in BS EN 12101-1.

4 Barrier assembly design

4.1 General

The barrier assembly shall be designed and manufactured to create a fire-separating element, providing integrity only or integrity with insulation and/or radiation protection as appropriate to the intended use (see Note 1), in a horizontal, vertical or angled orientation.

NOTE 1 Typical uses of the barrier assembly include:

- a) compartmentation;
- b) creating protected routes for the purpose of means of escape, where using standard fire doors/shutters and non-loadbearing walls and ceilings would be prohibitive to the design;
- c) protecting a non-fire-resisting component in a fire-resisting wall; a barrier assembly could be used in front of such elements to provide the necessary fire-resisting standard, e.g. in front of non-fire-resisting glazing and doorsets in an historic building, where required for compartmentation or protecting means of escape; and
- d) meeting the requirements for smoke leakage in conjunction with other non-smoke-rated products (e.g. lift door) protecting openings to reduce leakage of smoke.

Further information on the uses of barrier assemblies is given in [BS 8524-2](#).

NOTE 2 Recommendations for barrier assemblies when used as fire doors are given in [BS 9999](#) and [BS 9991](#).

4.2 Side retention

- 4.2.1** Barrier assemblies, whether single or multiple barrier units, that are reliant on side retention as part of their integral design, shall have no gaps between the fabric edge and the leading edge of the retention guide that would fail to meet the criteria for pressure (see [5.2.3](#)) and integrity (see [5.6.2](#)).

NOTE Barrier assemblies having side tabs (retention device that is fixed to, and extends beyond, the edge of the barrier assembly but is not integral to the barrier assembly itself) have been found in some circumstances to produce edge gaps in end-use applications (see [Figure 1](#)). Such tabs are permissible provided that the requirements are still met.

- 4.2.2** During installation, where side retention is used, it shall be identical to the tested samples. Where mechanical fixings are used at the side fabric edges to assist in retaining the fabric edge within the side retention system, these shall be as used in practice and shall be the identical type, size, pitch, and position on all relevant specimens.

4.3 Additional requirements for multiple barrier assemblies

- 4.3.1** Where multiple single barrier assemblies are used to create a larger barrier assembly, they shall be overlapped and shall be continuously conjoined at the bottom edge.

NOTE 1 [Figure 2](#) illustrates an example of the overlapping and conjoining of barrier assemblies.

NOTE 2 [Figure 3](#) illustrates examples of typical overlapping barrier assemblies.

- 4.3.2** The amount of overlap required for barrier assemblies other than the tested size shall be determined in accordance with [BS EN 15269-11:2018](#), **C.9** and **C.10**.

- 4.3.3** For barrier assemblies larger than those tested, the necessary overlap dimensions as determined in [4.3.2](#) shall be recorded.

NOTE The necessary overlap generally increases with the drop.

Figure 1 — Side guide options and bottom bar expansion

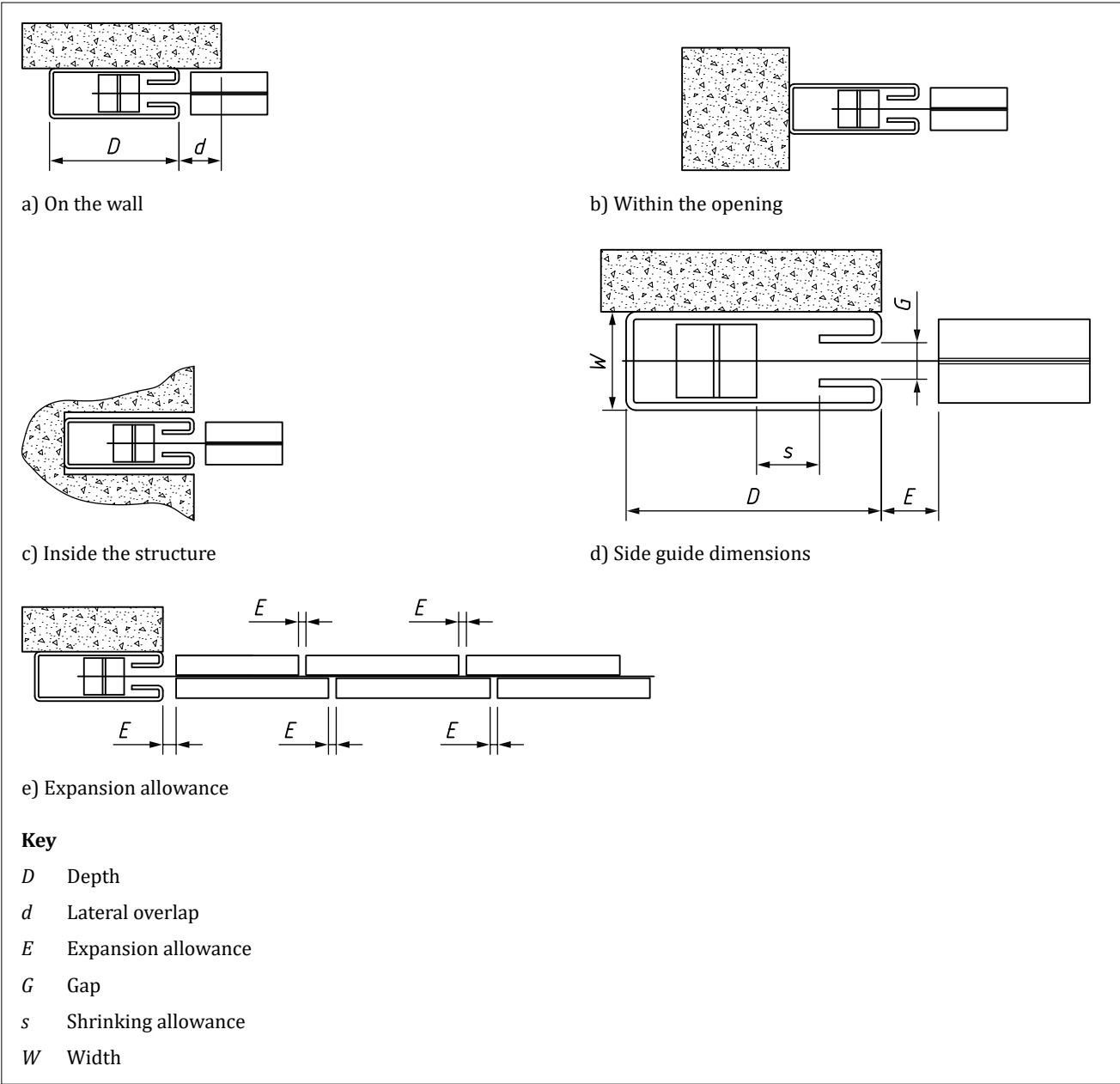


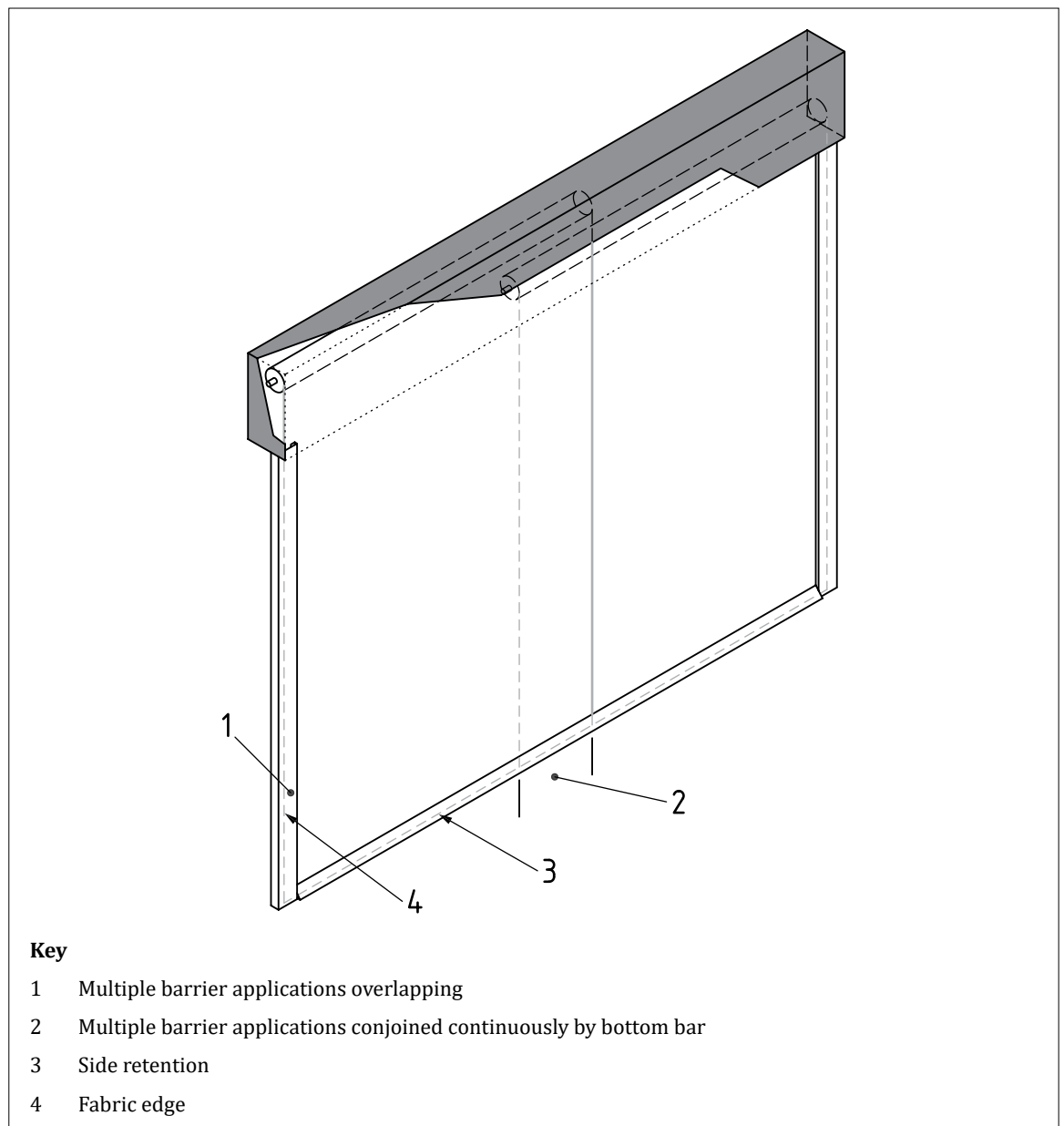
Figure 2 — *Example of overlapping and conjoining of barrier assemblies*

Figure 3 — Examples of typical barrier assembly arrangements