BS 1245:2012

BSI Standards Publication

Pedestrian doorsets and door frames made from steel sheet – Specification

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Publishing and copyright information

Published by BSI Standards Limited 2012

ISBN 978 0 580 56185 6

ICS 91.060.50

The following BSI references relate to the work on this standard:
Committee reference B/538/2
Draft for comment 11/30142900 DC

Publication history

First published 1945
Second edition, November 1951
Third edition, February 1975
Fourth (present) edition, June 2012

Amendments issued since publication

Date	Text affected

Contents

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 32, an inside back cover and a back cover.

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Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 June 2012. It was prepared by Subcommittee B/538/2, *Doors*, under the authority of Technical Committee B/538, *Doors, windows, shutters, hardware and curtain walling*. A list of organizations represented on these committees can be obtained on request to their secretary.

Supersession

This British Standard supersedes BS 1245:1975, which is withdrawn.

Relationship with other publications

This British Standard is related to the following other standards.

- BS EN 14351-1 is the harmonized European product standard for windows and external pedestrian doorsets without resistance to fire and smoke leakage characteristics. It gives a list of performance characteristics and classifications of performance, but does not give guidance on determining the appropriate classification for any specific application.
- BS 6375 is the national application document in the UK, giving performance requirements and guidance for the selection of appropriate classes of performance from BS EN 14351-1.
- BS 8213-4 provides guidance on the survey and installation of replacement external pedestrian doorsets.

Information about this document

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

- changes taking into account the publication of the harmonized European standard BS EN 14351 to remove any conflict between the standards [1)];
- information on how the requirements relate to the European Construction Products Directive [1].

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) At the time of publication of this edition of BS 1245, only BS EN 14351-1 has been published. Part 2 is in preparation. Part 3 (also in preparation) has been redesignated prEN 16034.

Particular attention is drawn to the Building Regulations 2010 [2], and to the corresponding Building (Scotland) Regulations 2004 [3] and Building Regulations (Northern Ireland) 2000 [4].

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1 Scope

This British Standard specifies requirements for the design, fabrication and performance of pedestrian doorsets with leaves manufactured from steel skins with a minimum thickness of 1.0 mm, where all surfaces are steel and the edges are steel and mechanically fixed. It applies to doors whose leaves are infilled with materials of either recycled cardboard honeycomb or mineral wool.

It covers both complete doorsets, and door frames that could be used for doorsets with non-metallic leaves.

It applies to doors fitted into frames in a factory, to be installed vertically (within 15°) into buildings, as single or double units, in coupled assemblies when appropriate, of the following types:

a) single leaf single-swing doors with or without side and over panels;

b) double leaf single-swing doors with or without side and over panels;

c) single leaf double-swing doors with or without side and over panels;

d) double leaf double-swing doors with or without side and over panels.

It is applicable to assemblies up to the point of installation.

This British Standard does not specify requirements for fire resistance or smoke control characteristics.

2 Normative references

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

BS 6100-1 (BS ISO 6707-1), *Building and civil engineering – Vocabulary – Part 1: General terms*

BS 6100-12, *Building and civil engineering – Vocabulary – Part 12: Plant, equipment and persons*

BS 6262 (all parts), *Glazing for buildings*

BS 6375 (all parts), *Performance of windows and doors*

BS 8000-7, *Workmanship on building sites – Part 7: Code of practice for glazing*

BS EN 1279 (all parts), *Glass in building – Insulating glass units*

BS EN 1670:2007, *Building hardware – Corrosion resistance – Requirements and test methods*

BS EN 1935, *Building hardware – Single-axis hinges – Requirements and test methods*

BS EN 10088-2, *Stainless steels – Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

BS EN 10152, *Electrolytically zinc coated cold rolled steel flat products for cold forming – Technical delivery conditions*

BS EN 10346:2009, *Continuously hot-dip coated steel flat products – Technical delivery conditions*

BS EN 12519, *Windows and pedestrian doors – Terminology*

BS EN 13141-1, *Ventilation for buildings – Performance testing of components/products for residential ventilation – Part 1: Externally and internally mounted air transfer devices*

BS EN 13142, *Ventilation for buildings – Components/products for residential ventilation – Required and optional performance characteristics*

BS EN ISO 4042, *Fasteners – Electroplated coatings*

BS EN ISO 9227, *Corrosion tests in artificial atmospheres – Salt spray tests*

3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS 6100-1, BS 6100-12, BS EN 12519 and the following apply.

3.1 coupled assembly
two or more doorsets mechanically joined to fill an opening

NOTE This was previously known as a composite assembly.

3.2 door frame
part of a doorset surrounding a door leaf and to which the door leaf is hinged

3.3 door leaf
moving element within a doorset

3.4 doorset
complete unit, as installed, comprising door leaf, door frame, any associated side panels and/or top lights, and any operating hardware, locks and accessories

NOTE This is also known as a door assembly.

3.5 fixing
component that is used to secure separate parts of a doorset to each other, to secure an item of hardware to a door part, or to secure a completed doorset into the structure of a building

3.6 glazing gasket
plastic or synthetic rubber member used between the glazing and the frame and/or between the glazing and the glazing bead

3.7 hardware
device attached to a structural member of a doorset to facilitate opening, closing or making the product secure in the frame

3.8 sill
horizontal bottom member of a door frame

NOTE This is sometimes referred to as a threshold.

3.9 ventilation device
ventilator other than an opening light incorporated into a doorset

NOTE 1 A permanent ventilation device provides continuous ventilation. A controlled device can be closed and may be adjusted to provide ventilation.

NOTE 2 A ventilation device is referred to as an "air transfer device" in BS EN 13142 and is frequently referred to as a "trickle ventilator" in the UK.

3.10 weatherseal
resilient material designed to reduce air infiltration and water penetration

NOTE This is sometimes referred to as a weatherstrip.

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3.11 work size
width and height of the doorset to be supplied, as agreed between the manufacturer and the customer, established from a designed or built structural opening

4 Handing

The handing shall be in accordance the specification provided.

Where the manufacturer is specifying the handing, the specification shall conform to Annex A.

NOTE Where the manufacturer is not specifying the handing, care should be taken to check the handing designation. See Annex A.

5 Components

5.1 Steel materials

NOTE 1 Typical external steel door leaves are 40 mm to 55 mm, and the steel skins are normally 1.0 mm or 1.2 mm. Internal door leaves can be of reduced thickness and have lighter gauge skins. Some special doors for acoustic and/or security performance can be thicker and have skins of greater thickness.

Door leaves and frames shall be fabricated from one of the following:

- mild steel sheet, electro zinc coated conforming to BS EN 10152;
- mild steel sheet, hot-dip zinc coated, conforming to BS EN 10346:2009, coating designation Z275;
- austenitic stainless steel sheet or strip conforming to BS EN 10088-2.

Where metal reinforcement is used it shall be manufactured from one of the following metals:

a) mild steel strip, hot-dip zinc coated, conforming to BS EN 10346:2009, coating designation Z275. This type of reinforcement shall be only used in profiles or systems designed and sealed so that no exterior moisture can come into contact with the reinforcement;

b) mild steel sections which are subsequently given a corrosion-resistant coating in order to conform to the requirements in a);

c) austenitic stainless steel sheet or strip conforming to BS EN 10088-2.

NOTE 2 This type of reinforcement can be used in any type of profile or system.

5.2 Infill material

Door leaves shall be infilled with material from one of the following:

- recycled cardboard honeycomb of a cell size of 27 mm to 28 mm and a minimum weight of 170 gsm;
- mineral wool or other insulation slabs which require additional stiffeners to reinforce the steel skins.

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5.3 Hardware and hardware reinforcements

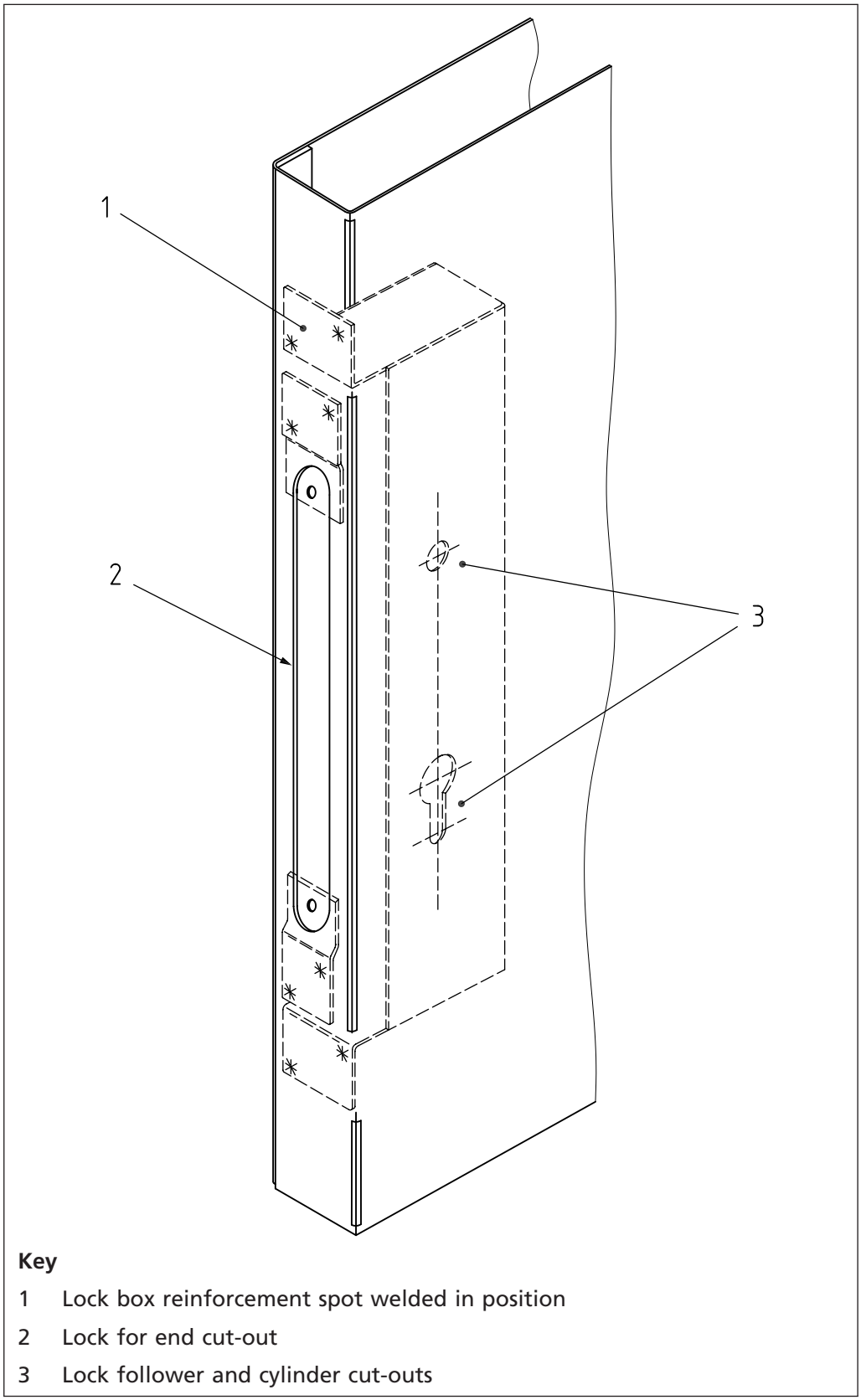
5.3.1 Locks and latches

Locks and/or latches shall be fitted using the lock/latch manufacturer's installation instructions using a lock box reinforcement, of sufficient thickness to accommodate the hardware manufacturer's recommended machine screw fixings, fixed inside the door leaf.

NOTE 1 A typical lock preparation detail is shown in Figure 1. Other arrangements are possible.

NOTE 2 Guidance on the positioning of lock/latch and operating furniture is given in BS 8300 and Figure 2. Other arrangements are possible.

Figure 1 **Typical isometric lock preparation detail in door leaf**



Key

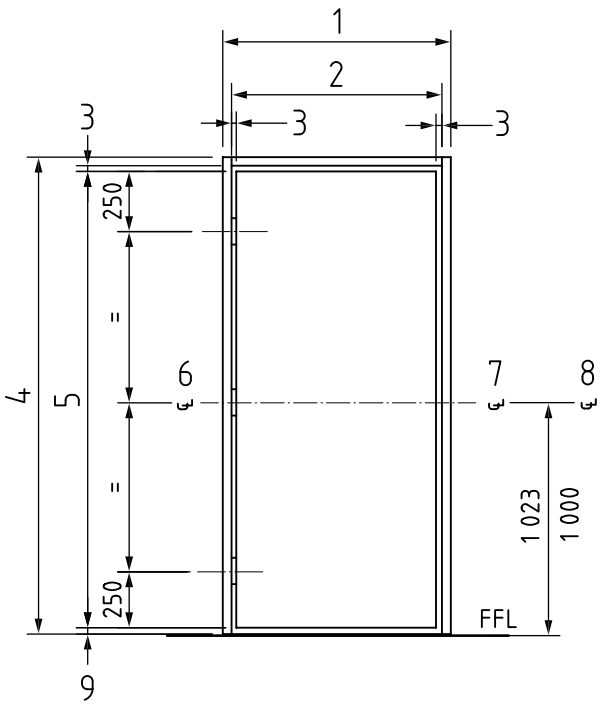
1 Lock box reinforcement spot welded in position

2 Lock for end cut-out

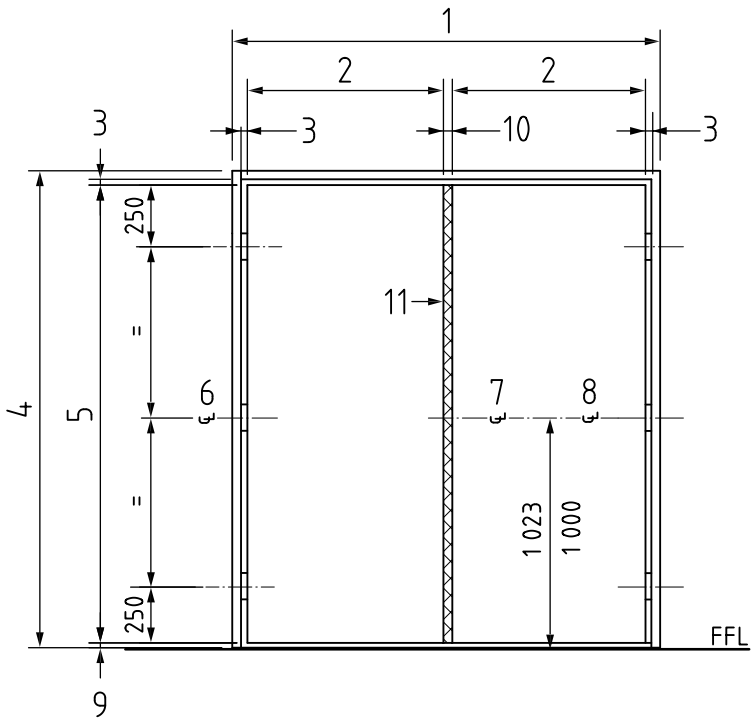
3 Lock follower and cylinder cut-outs

Figure 2 **Typical doorset configurations and hardware locations**

Dimensions in millimetres



a) Single doorset configuration



b) Double doorset configuration

Key

1 Overall frame width
2 Leaf width
3 Gap (3 mm)
4 Overall frame height
5 Overall leaf height
6 Hinge
7 Lock case
8 Panic device
9 Undercut (3 mm to 20 mm)
10 Gap (4 mm)
11 Astragal (if required)

NOTE Hinge quantities and centres depend on leaf size, and may be increased in accordance with the manufacturer's recommendations.

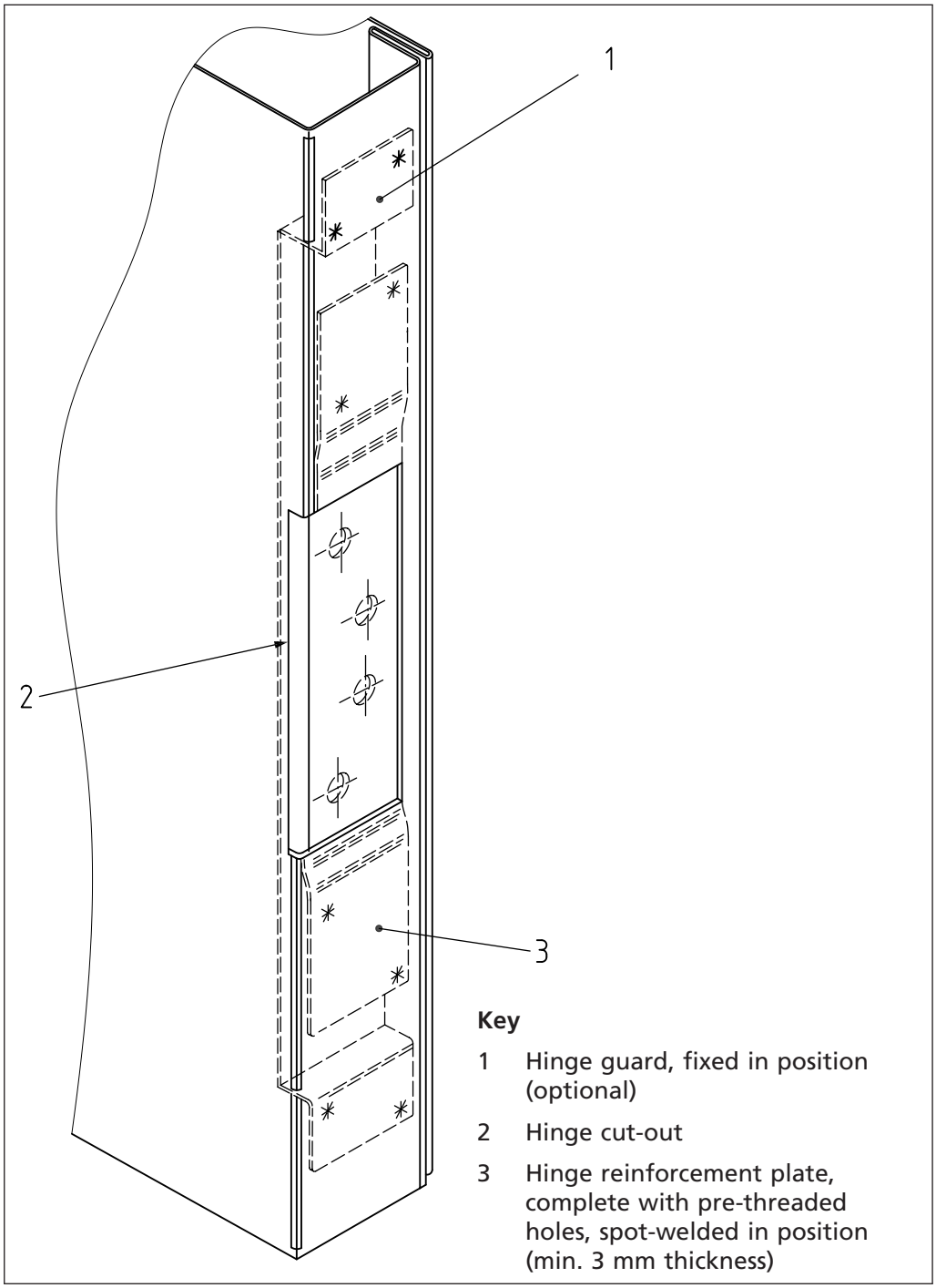
5.3.2 Hinges

Hinges shall conform to BS EN 1935 unless otherwise specified by the purchaser.

The hinges shall be welded or screwed to the frame at the manufacturer's discretion. Where screwed on hinges are used, there shall be a reinforcing plate fixed to the frame to which the hinge shall be screwed. The plate shall be of steel not less than 3 mm nominal thickness. The length of the plates shall be not less than 70 mm greater than the length of the hinge.

NOTE A typical hinge preparation detail is shown in Figure 3. The position of the hinges for internal and external doorsets is typically as shown in Figure 2.

Figure 3 **Typical isometric hinge preparation detail in door leaf**



5.3.3 Finishes of hardware except for fixings

Materials for all hardware, except for fixings as defined in **3.5**, shall have at least the equivalent corrosion resistance of BS EN 1670:2007, grade (class) 3 when subjected to a neutral salt spray test as specified in BS EN ISO 9227. Tests shall be carried out on complete hardware items as supplied.

NOTE 1 There is no direct correlation between a given number of hours salt spray testing and real-time natural environment exposure.

NOTE 2 In certain coastal or industrial environments, austenitic stainless steel hardware conforming to BS EN 10088-2, is particularly suitable.

Threaded components shall be treated in accordance with BS EN ISO 4042.

5.4 Glazing materials

The type, thickness and quality of glass shall be selected using the recommendations given in the relevant part of BS 6262.

Insulating glass units shall conform to BS EN 1279.

Glazing gaskets shall be suitable for the type and quality of the glass selected or specified.

5.5 Finishes

Doorsets shall be covered with a corrosion-inhibitive protective primer coating prior to delivery. For doorsets with factory-applied finishing systems, if a primer is used, it shall be applied before the final coating.

NOTE 1 Doorsets that are to be installed in corrosive atmospheres or marine environments might require additional protection.

Both the primer (where used) and the final coating shall be applied in accordance with the manufacturer's recommendations.

NOTE 2 The finish needs to be durable. A single coat will give a cover of 30 μm to 40 μm. When a primer is added under the top coat then 60 μm would be the minimum thickness. If necessary the coating specification should be agreed between the manufacturer and the customer prior to supply.

6 Construction and design

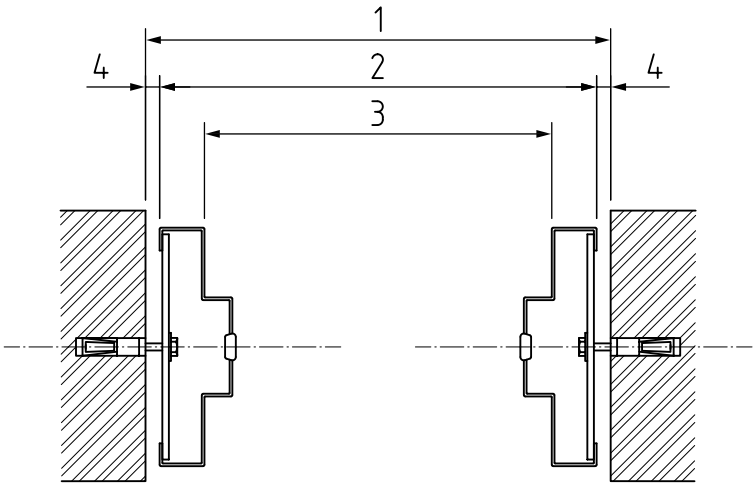
NOTE Additional guidance on the construction of door leaves is given in Annex B.

6.1 Sizing

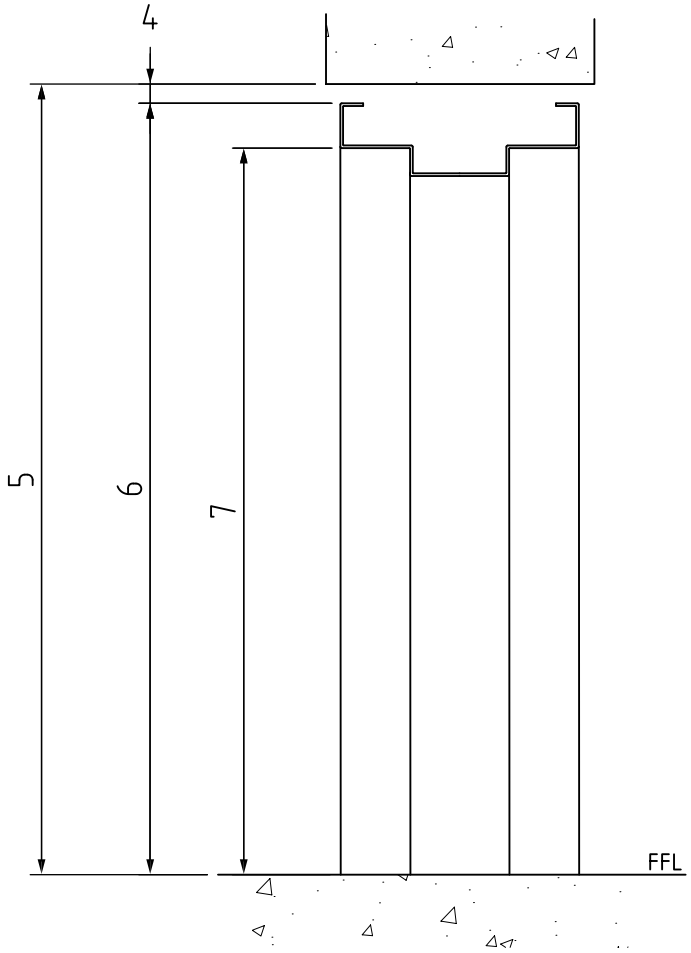
The opening sizes shall be as shown in Figure 4 and Figure 5. Where both sizes are quoted the width shall be given before the height.

NOTE Attention is drawn to Approved Documents B [5] and M [6] of the Building Regulations 2000 [2] in respect of effective clear opening widths.

Figure 4 **Key to sizing: between reveals (second fix)**



a) Plan view on structural opening

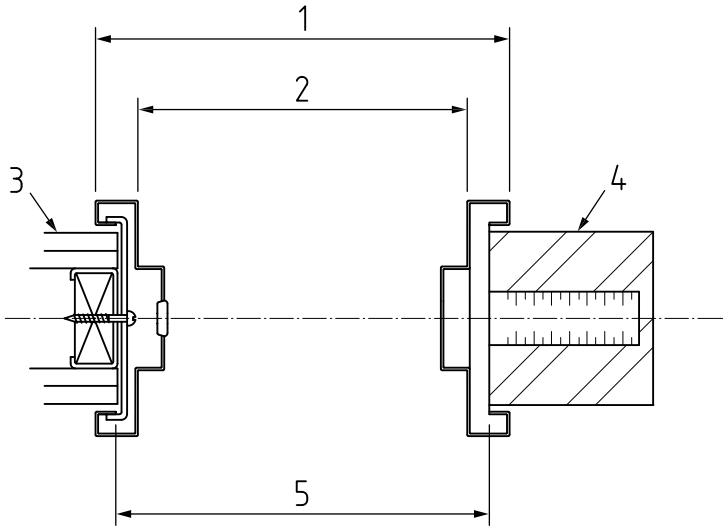


b) Vertical section through structural opening

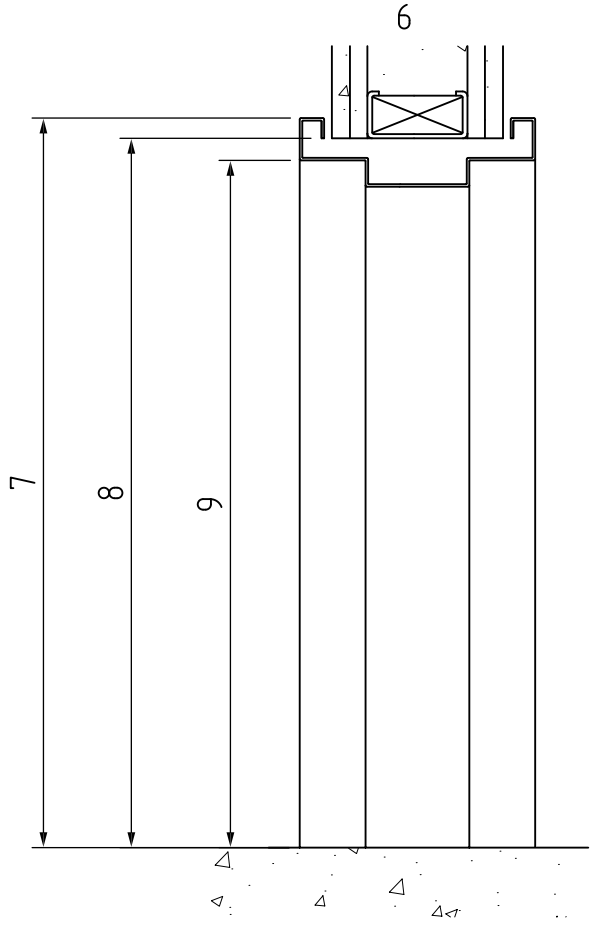
Key

1 Structural opening width
2 Overall frame width
3 Rebate width
4 Fitting tolerance (0 mm to 20 mm)
5 Structural opening height
6 Overall frame height
7 Rebate height
FFL Finished floor level

Figure 5 **Key to sizing: studwork or built in to brickwork (first fix)**



a) Plan view on structural opening



b) Vertical section through structural opening

Key

1 Overall frame width
2 Rebate width
3 Studwork
4 Wall anchor built into brickwork
5 Structural opening width
6 Studwork lintel
7 Overall frame height
8 Structural opening height
9 Rebate height

6.2 Manufacturing tolerances

The overall width and height of the doorset shall be the work size minus manufacturer's clearance, to allow fitting into an as-built structural opening (**3.11**).

6.3 Door frame construction

*COMMENTARY ON **6.3***

The frames for steel doorsets or for doorsets with non-metallic leaves are normally profiled from 1.2 mm or 1.5 mm thick steel sheet in various shapes and sizes. Each frame consists of two jambs and head member and, when applicable, a transom and/or sill. The whole is then rigidly joined together either by mechanical means or welding.

Steel doorset manufacturers use different methods of assembling door frames. These can be by mechanical means or welding. A number of typical assembly methods are shown in Figure 6.

Typical single and double rebate profile frames are shown in Figure 7. A typical double swing pivot jamb profile and the strike and head profiles are shown in Figure 8.

Where a transom is fitted the rebate of the transom shall fit flush with the rebate of the door frame.

Reinforcements shall be welded or mechanically fixed to the frame to receive hinges and/or lock strike plates.

When required, door frames shall be fitted with a sill, which shall be fixed flush to the base of the frame to suit the door frame profile.

NOTE Typical sill details are shown in Figure 9.

When frames are to be installed in wet construction, mortar guards shall be fixed in the frame at locations provided for lock/latch strike plates, hinges or bolts.

Frame silencers shall be fitted to the stop of the frame to cushion the closing of the door leaf unless weatherstrips or smoke seals are fitted.

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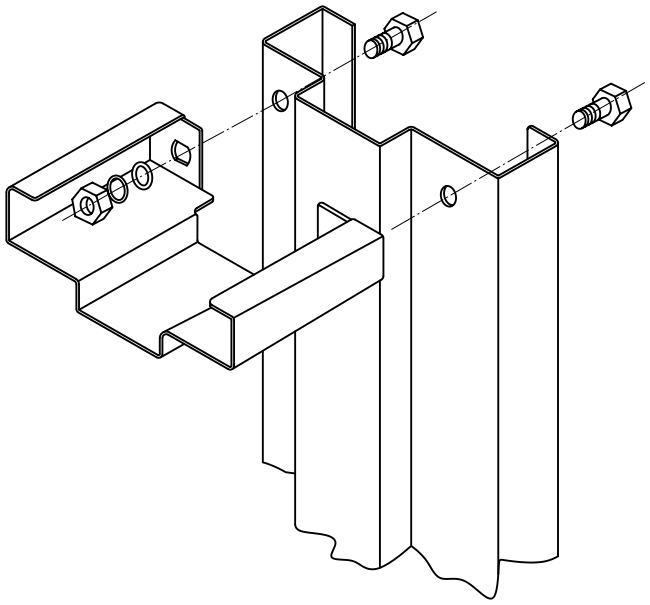
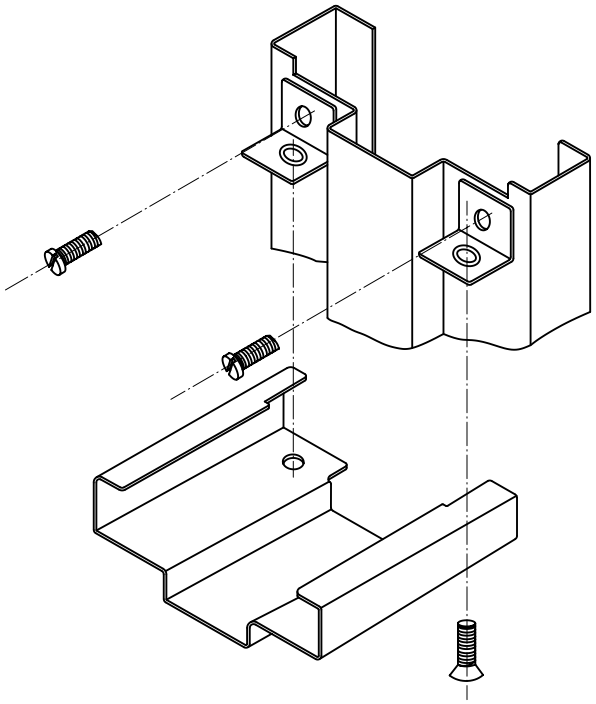
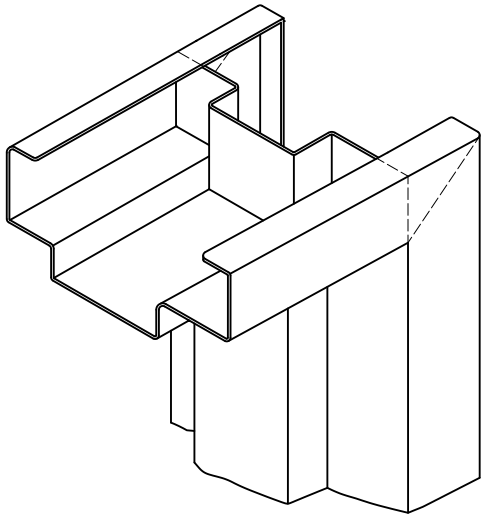
Figure 6 **Typical frame assembly methods**



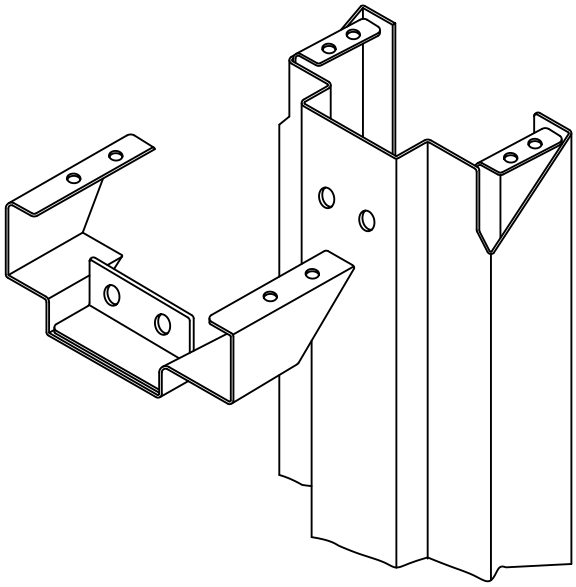
a) Knock-down butt joint



b) Push-up head



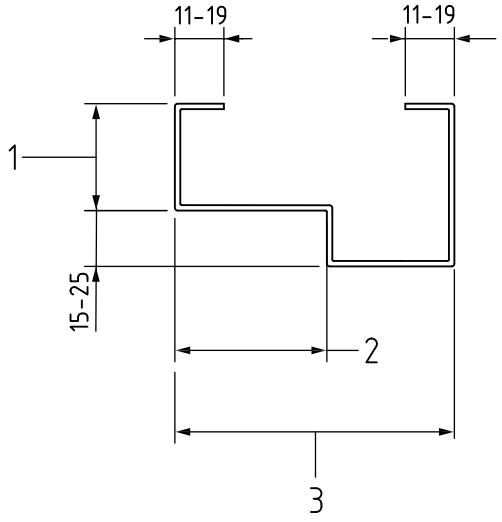
c) Butt or mitre welded



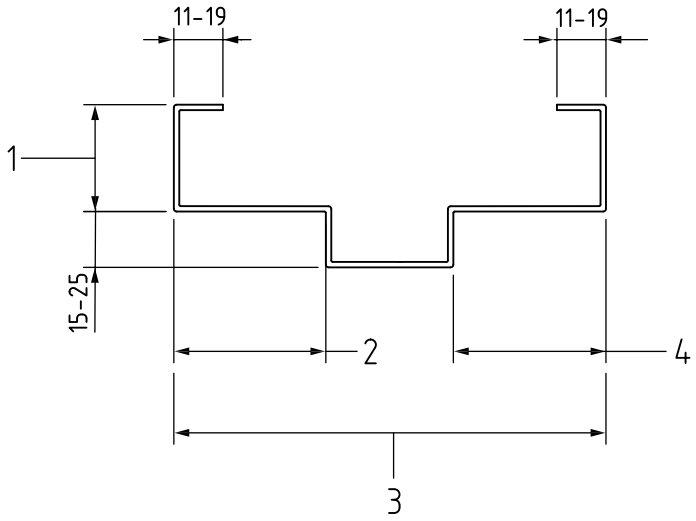
d) Butt mitre bolted

Figure 7 **Typical profiles for single swing jambs and heads**

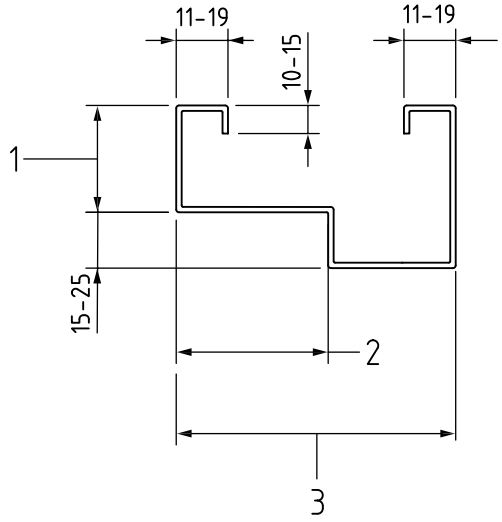
Dimensions in millimetres



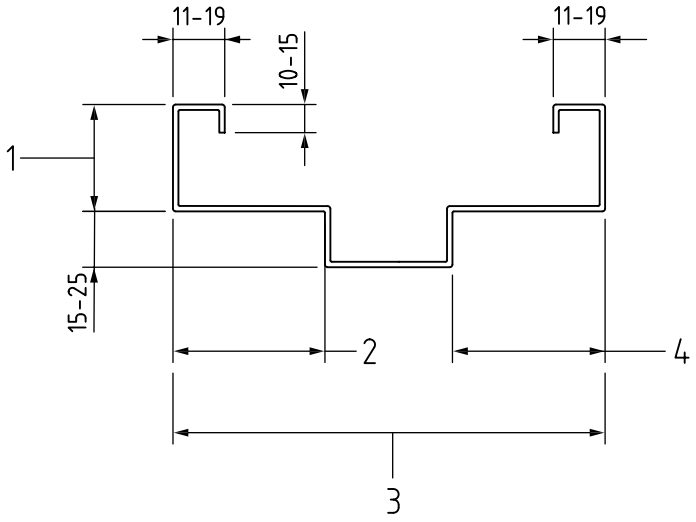
a) Single rebate profile



b) Double rebate profile



c) Single rebate wrap-around profile



d) Double rebate wrap-around profile

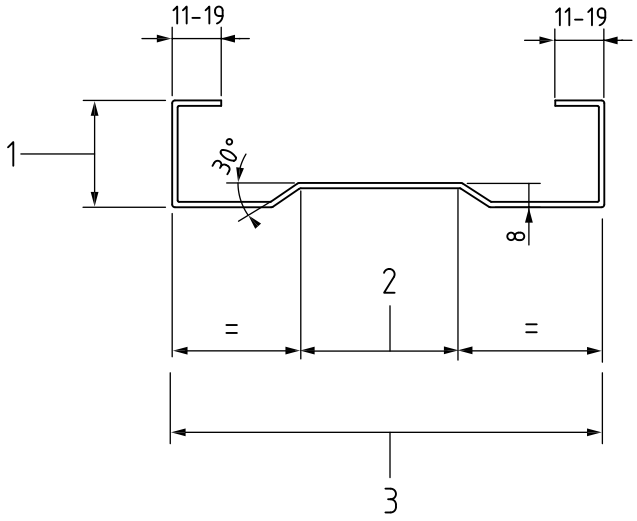
Key

1 Variable frame face
2 To suit leaf thickness
3 To suit wall condition
4 Equal to leaf rebate

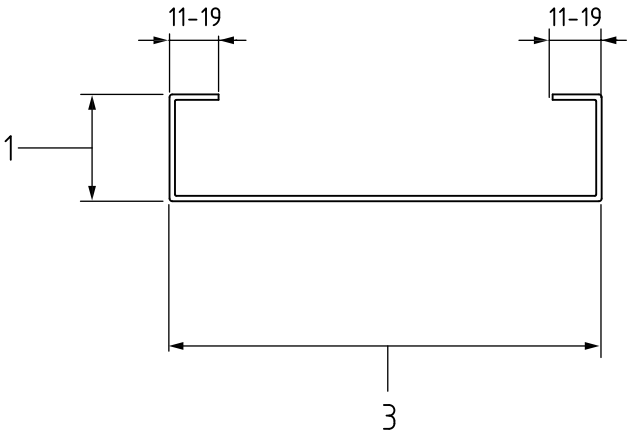
NOTE Profiles may be designed to suit project-specific wall conditions.

Figure 8 **Typical profiles for double swing jambs and heads**

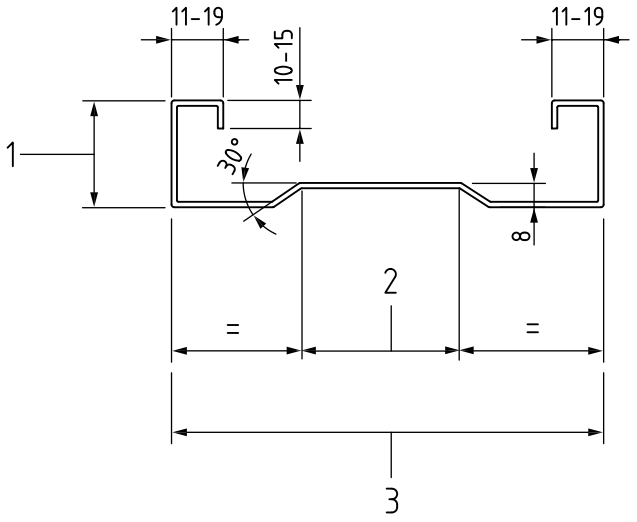
Dimensions in millimetres



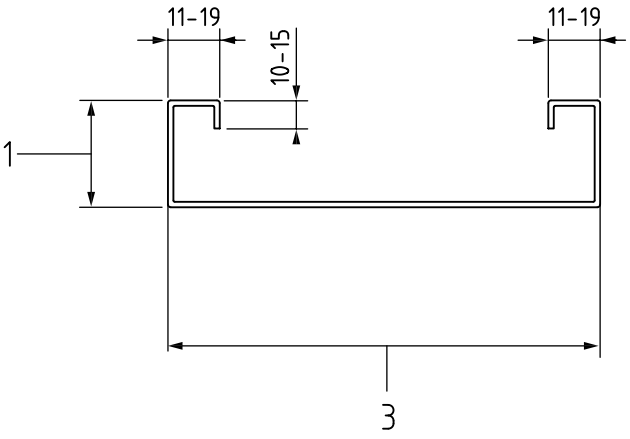
a) Double swing pivot profile



b) Double swing strike and head profile



c) Double swing wrap-around pivot jamb profile



d) Double swing wrap-around strike jamb and head profile

Key

1 Variable frame face

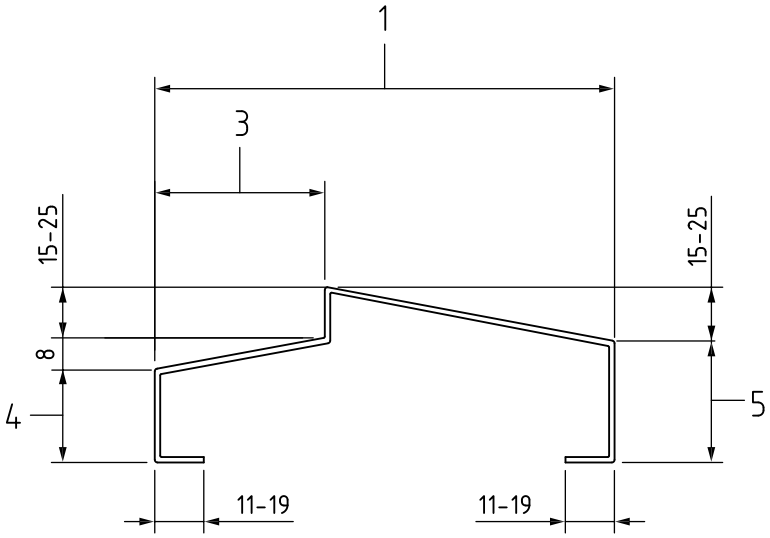
2 To suit leaf thickness

3 To suit wall condition

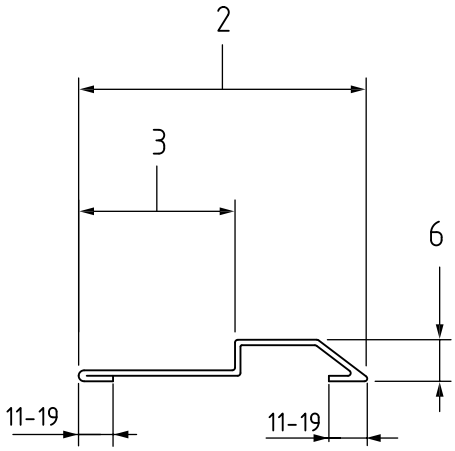
NOTE Profiles may be designed to suit project-specific wall conditions.

Figure 9 **Typical sill details**

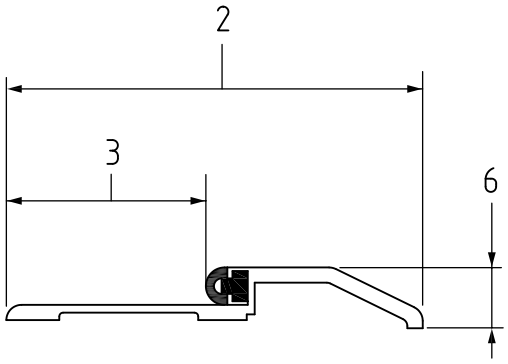
Dimensions in millimetres



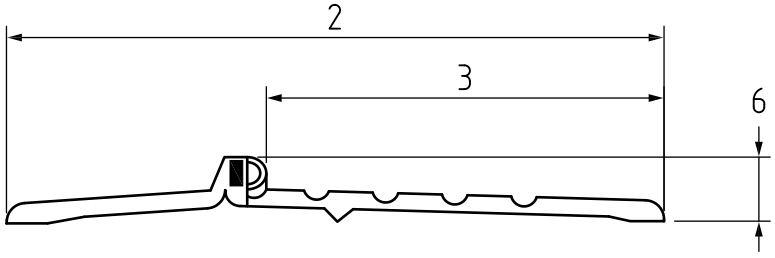
a) Sill profile



b) Low profile sill profile



c) Low profile aluminium threshold



d) Inward opening aluminium threshold

Key

1 To suit wall condition
2 To suit jamb profile
3 To suit leaf thickness
4 Variable frame face
5 Variable frame face +8 mm
6 Maximum 15 mm

NOTE Formed profiles may be designed to suit project-specific wall conditions.

6.4 Frame fixing methods

*COMMENTARY ON **6.4***

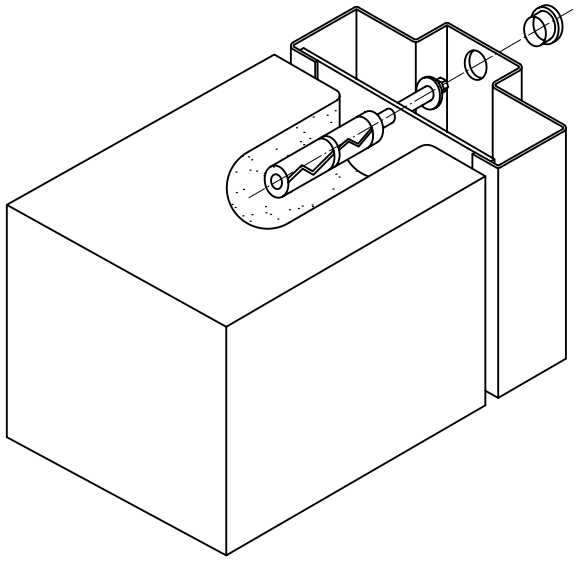
The way in which steel doorsets are fixed to openings depends on the opening construction which can be masonry, partitioning or cladded steelwork. When steel doorsets are fitted to cladding it is critical that the supporting steel structure is capable of providing a solid and rigid base to prevent movement of the door frame when the door is being used. It is recommended that the thickness of the supporting steelwork should be at least 3 mm. It is also important that where applicable the effect of thermal bridging is taken into account in the design of the interface between the door frame and the wall.

The frame fixings shall be provided by the doorset manufacturer and shall be appropriate for the type of fixing method required (see Note 1).

NOTE 1 When the door is set in position and the opening built around it, it is known as "first fix". Where the opening is already constructed and the doorset fitted afterwards it is known as "second fix". The type of fixing to use with the appropriate profile frame then requires fixings suitable for the structure.

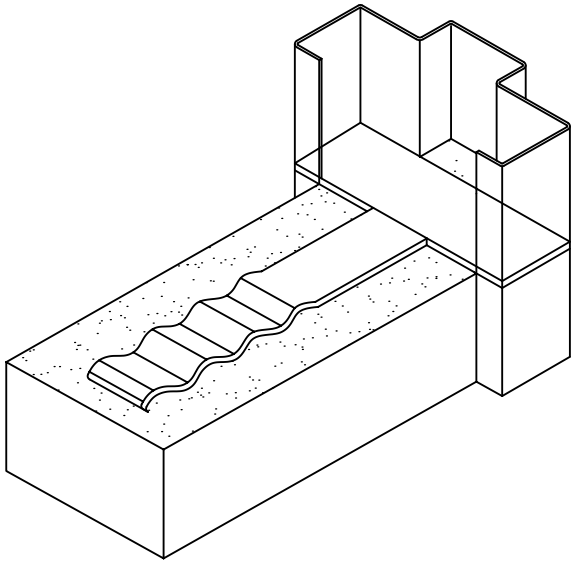
NOTE 2 Typical frame fixing methods are shown in Figure 10.

Figure 10 **Typical frame fixing methods** *(1 of 2)*

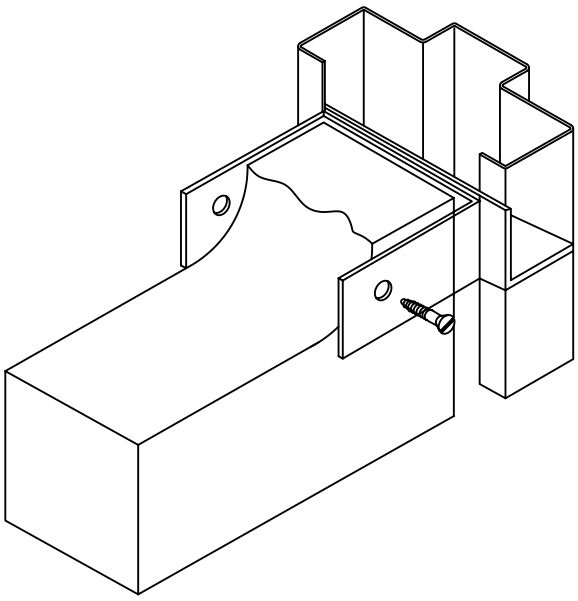


NOTE Packing shims removed for clarity.

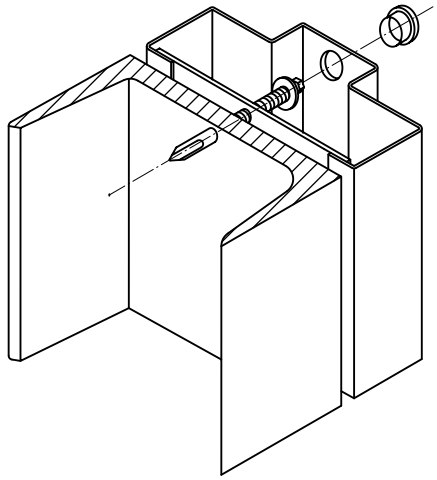
a) Expansion bolt complete with plug



b) "T" wall anchor (first fix)



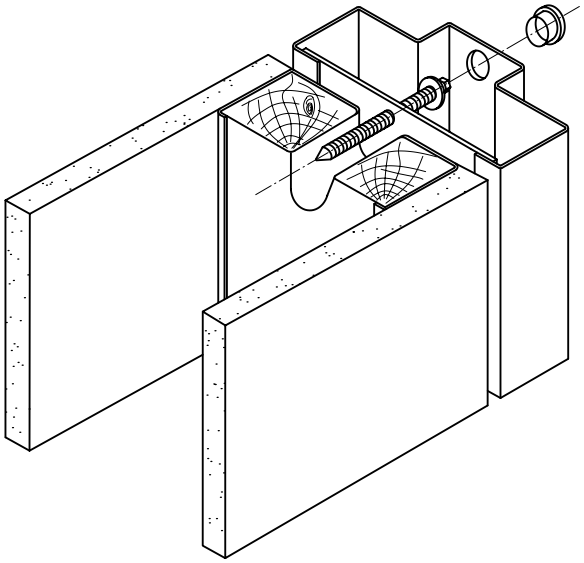
c) Wrap-around anchor

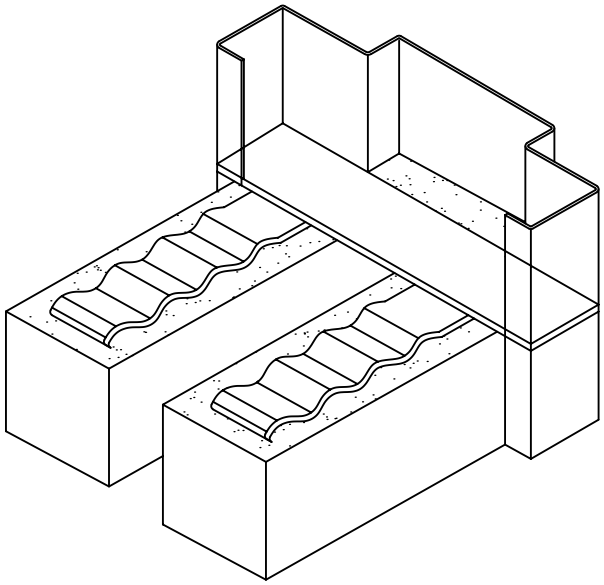


NOTE Packing shims removed for clarity.

d) Self-drilling/self-tapping screw into steelwork complete with plug

Figure 10 **Typical frame fixing methods** *(2 of 2)*

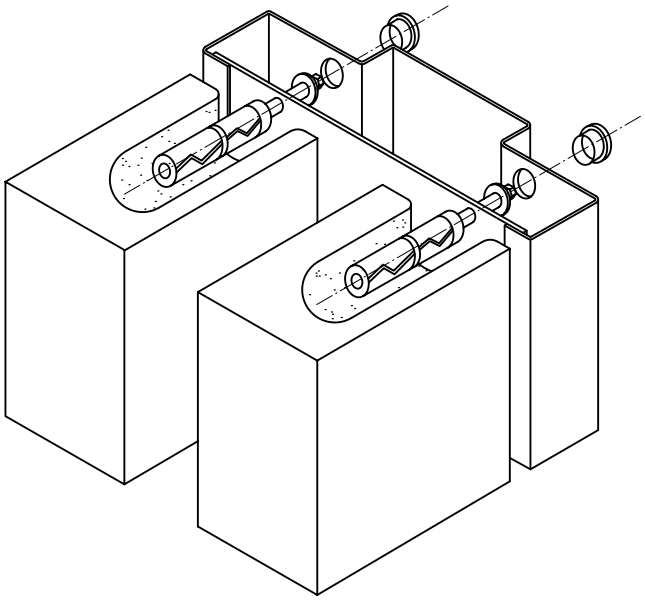




NOTE Packing shims removed for clarity.

e) Woodscrew complete with plug into studwork

f) Cavity "T" wall anchor (first fix)



NOTE Packing shims removed for clarity.

g) Expansion bolts complete with plugs to bridge cavity in wall

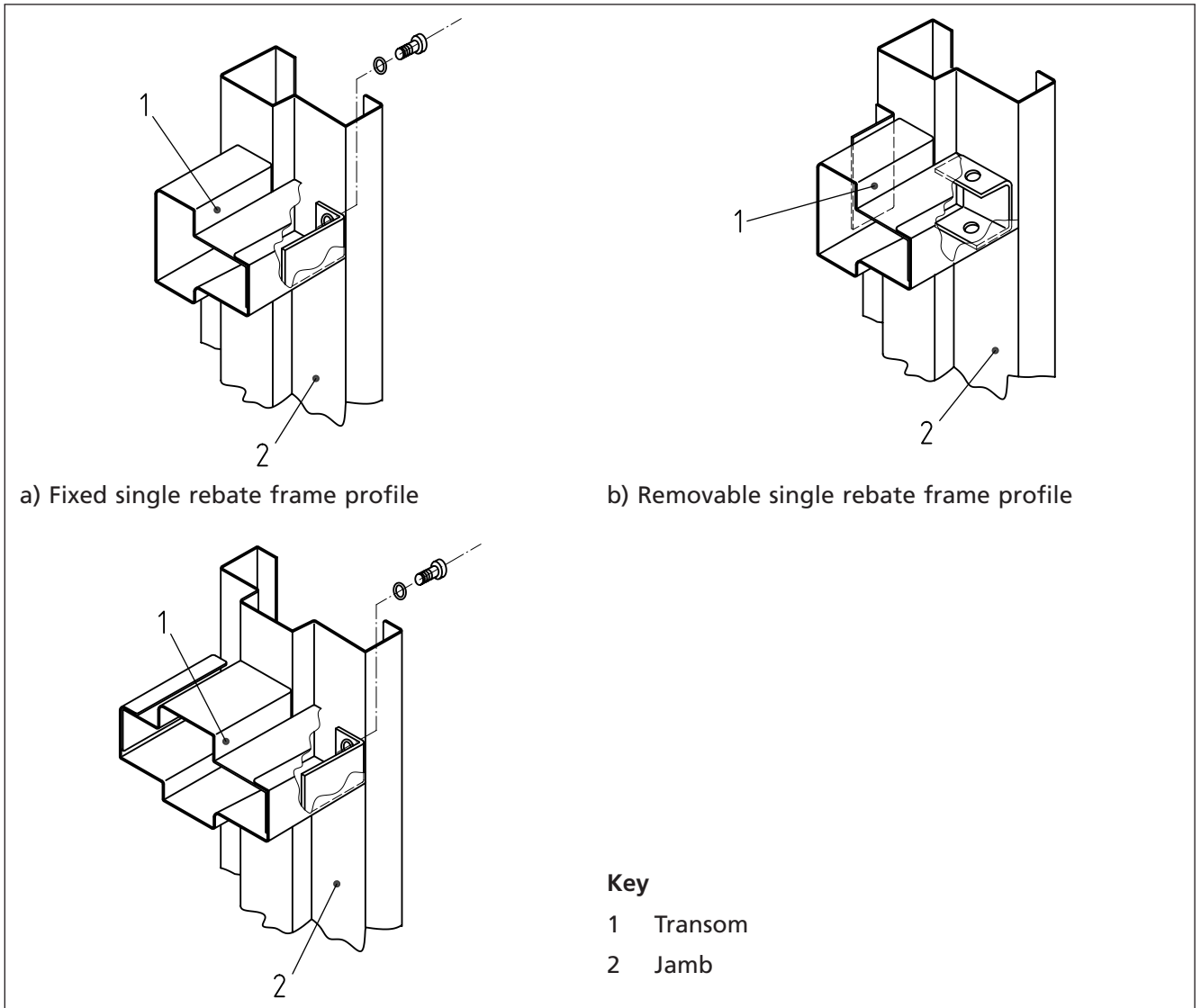
6.5 Over panels and side panels

NOTE Over panels in ceiling height frames may be solid, with or without a transom bar, glazed or with ventilation devices. A typical transom fixing detail is shown in Figure 11. The method of fixing will vary from manufacturer to manufacturer when the panels are permanently fixed but sometimes the panels are removable, in which case a typical detail is shown in Figure 12. A typical detail of fixing a glazed over panel is shown in Figure 13.

The method of construction of any top and/or side panels shall be the same as that used for the door leaf.

Where infillings other than glazing are used, they shall be constructed in the same way as the door leaf.

Figure 11 **Typical transom assembly methods**



a) Fixed single rebate frame profile

b) Removable single rebate frame profile

c) Fixed double rebate frame profile

Key

1 Transom

2 Jamb

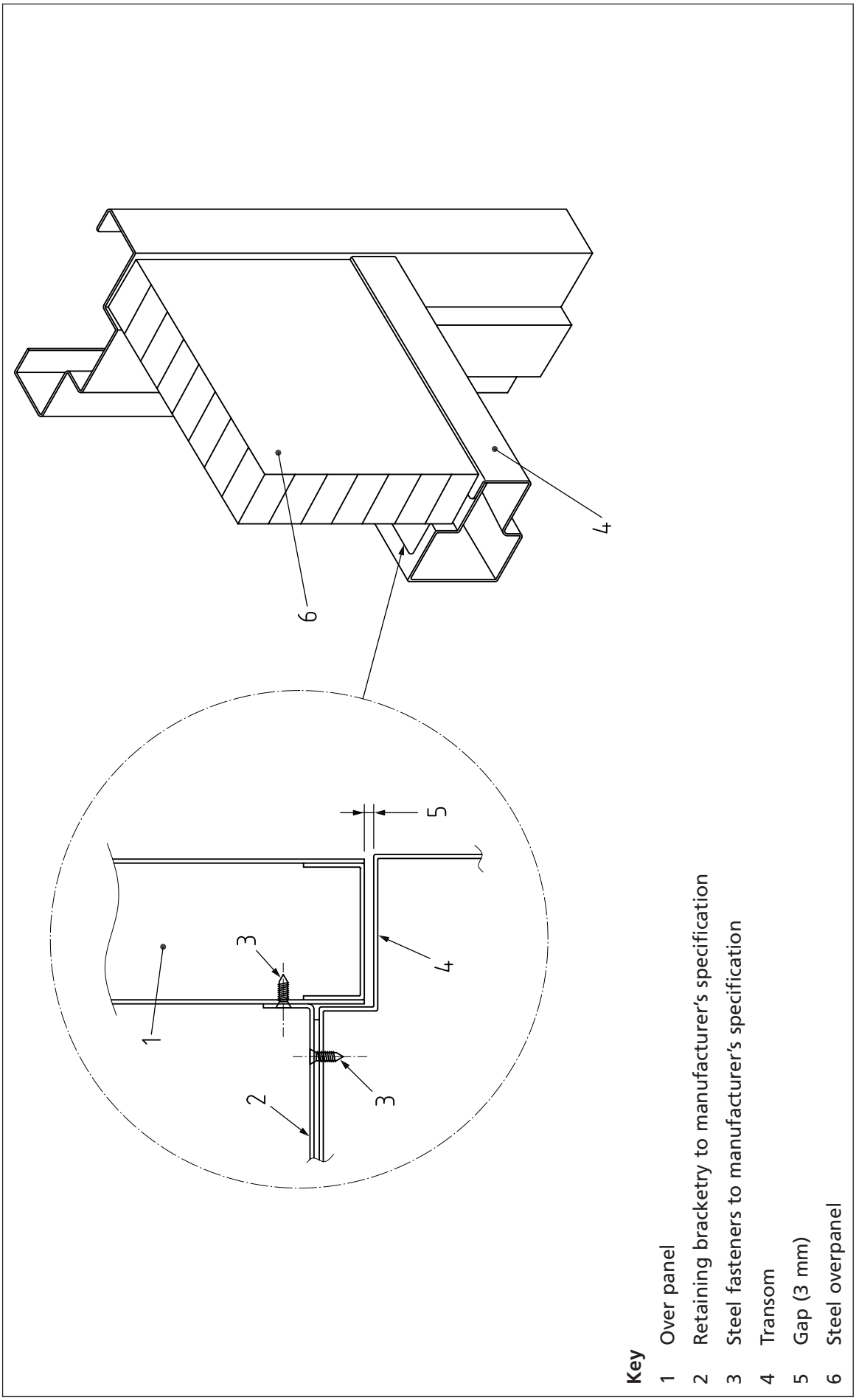
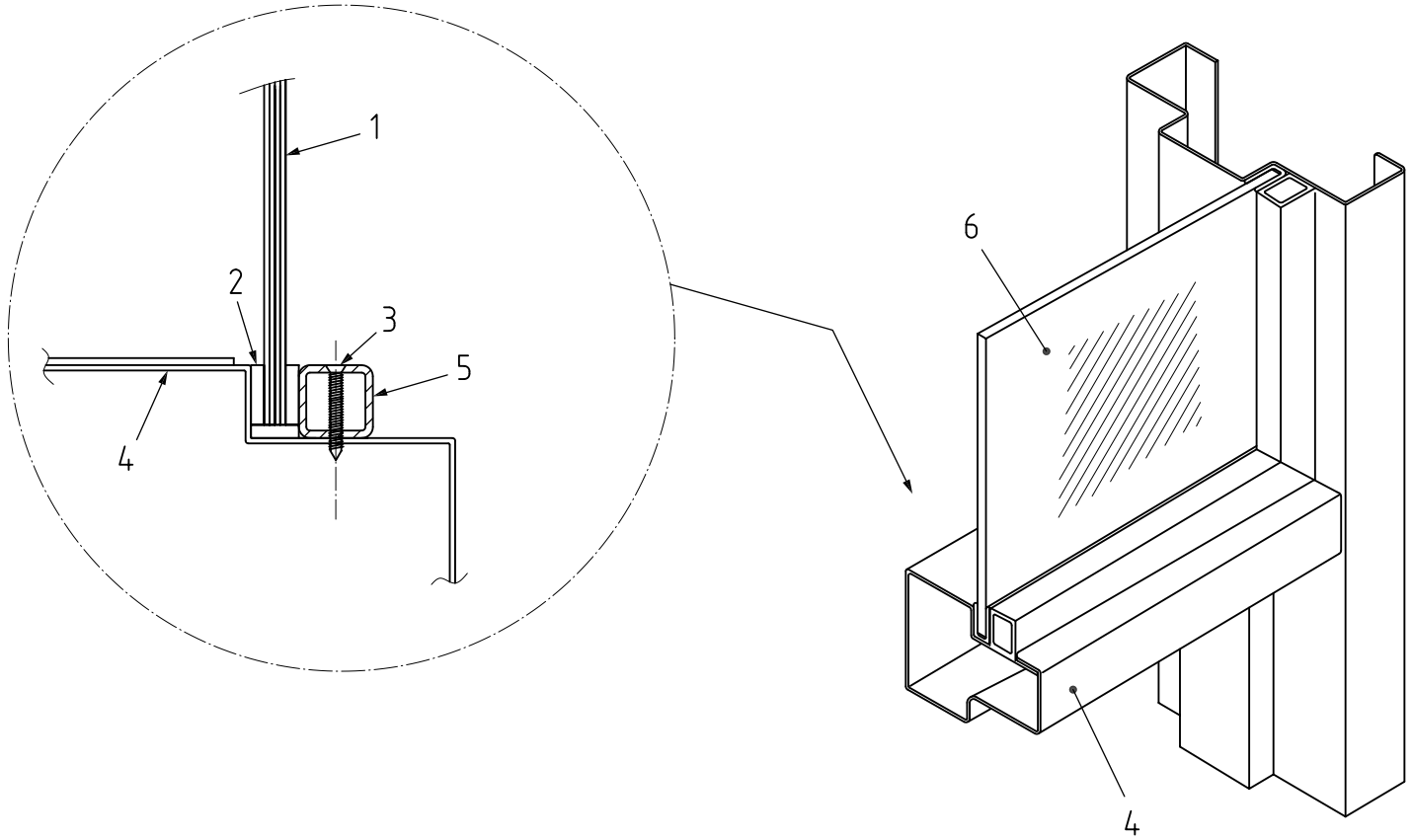


Figure 12 **Typical removable steel over panel detail**

Key

1 Over panel
2 Retaining bracketry to manufacturer's specification
3 Steel fasteners to manufacturer's specification
4 Transom
5 Gap (3 mm)
6 Steel overpanel

Figure 13 **Typical glazed over panel detail**



Key

1 Minimum 6 mm thick glass (non-fire-rated doorsets supplied with toughened or laminated safety glass; fire-rated doorsets supplied with fire-rated safety glass)

2 Glazing gasket to match performance specification/manufacturer's recommendations

3 Glazing bead secured in position with steel fasteners or proprietary clips in accordance with manufacturer's recommendations

4 Transom

5 Mitre or butt jointed steel or aluminium glazing bead to manufacturer's recommendations

6 Glazed panel

7 Glazing

Any glazing shall be in accordance with the recommendations given in the relevant part of BS 6262 and BS 8000-7. Doorsets shall also be designed to allow re-glazing without removing the outer frame from the structure of the building.

NOTE Attention is drawn to the glazing safety recommendations of BS 6262-4, particularly the requirements for marking the glass.

8 Ventilation devices

Ventilation devices shall not permit the penetration of moisture into any profile chambers that are not designed to have moisture in them.

NOTE Conformity to this requirement is determined by visual examination.

9 Installation, use, cleaning and maintenance

Guidance on the installation, use, cleaning and maintenance of doorsets shall be provided by the door manufacturer. Where appropriate, this shall include guidance on suitable types of finishing paint for doorsets that are to be finished on site.

10 Security

10.1 Basic security

Where basic security forms part of the requirements, when a completed doorset is subjected to the basic security test specified in BS 6375-3, it shall not be possible to gain entry.

10.2 Enhanced security

When enhanced security forms part of the requirements, doorsets shall conform to BS 6375-3.

11 Safety in case of fire

11.1 Fire resistance

Where fire resistance forms part of the requirements, it shall be declared in accordance with BS 6375-3.

11.2 Reaction to fire

Where reaction to fire forms part of the requirements, it shall be declared in accordance with BS 6375-3.

12 Safety in use

12.1 Impact resistance

Where impact resistance forms part of the requirements, it shall be declared in accordance with BS 6375-2.

12.2 Safety devices

Any safety devices shall conform to the requirements specified in BS 6375-2.

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12.3 Emergency exit and panic devices

Any emergency exit devices or panic exit devices shall conform to the requirements in specified in BS 6375-3.

13 Weathertightness

Where weathertightness forms part of the requirements for external doorsets, the completed doorset shall meet the weathertightness requirements for the appropriate classification specified in BS 6375-1, when tested in accordance with BS 6375-1.

14 Operation and strength characteristics

Operation and strength characteristics shall be declared in accordance with BS 6375-2.

15 Hygiene, health and the environment

NOTE 1 This clause is relevant to Essential Requirement 3 of the Construction Products Directive [1].

NOTE 2 There is a requirement in BS EN 14351-1 for the manufacturer to declare if there is a risk of any potentially dangerous substances being released from the doorset during normal intended use.

The performance of any ventilation device (**3.9**) mounted within the doorset shall be classified in accordance with BS EN 13142 when tested in accordance with BS EN 13141-1.

16 Acoustic performance

When specified, acoustic performance shall be declared in accordance with BS 6375-3.

17 Energy conservation

Where thermal resistance forms part of the requirements for energy conservation, the U value of the doorset shall be declared in accordance with BS 6375-3.

18 Marking

Each doorset shall be identified with the following information:

a) the number and date of this British Standard, i.e. BS 1245:2012 [2)];

b) claimed performance classifications;

c) the name or trademark of the manufacturer or other means of identifying the manufacturer; and

[2)] Marking BS 1245:2012 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is therefore solely the responsibility of the person making the claim. Such a declaration is not to be confused with third party certification of conformity, which might also be desirable.

d) means of traceability.

The identification shall be affixed:

- to any suitable part of the product; or
- on an attached label; or
- on its packaging; or
- on the accompanying commercial documents; or
- on the manufacturer's website; or
- in the manufacturer's published technical specifications.

Annex A (normative) Specification for handing

A.1 View

When specifying handing, the door shall be viewed from the pull side.

NOTE 1 Drawing conventions for door types are illustrated in Figure A.1. The European designations (BS EN 12519) are significantly different and care should be taken to establish which is being used.

NOTE 2 Figure 1 uses the following general conventions.

a) Doorsets are always handed from the pull to open (hinge) side of the doorset.

b) The outside is always treated as the more secure side of the doorset, irrespective of whether internal or external.

c) Unless advised otherwise:

- *the key side of cylinders is fitted to the outside;*
- *pull handles are fitted to the pull side;*
- *door closers are fitted to the inside;*
- *the secure side of vision panels and louvers is outside.*

A.2 Side-hung doorsets

The handing of side-hung pedestrian doorsets shall be described by the hinge position when viewed from the pull side.

NOTE 1 For instance, a door viewed from the outside with the hinges on the left, is a left-hand door.

NOTE 2 Care should be taken to avoid confusion with door handing specified in accordance with BS EN 12519, which is determined by hinge position but viewed from the opening face which might be outside or inside.

A.3 Vertically pivoted doorsets

For doorsets pivoted vertically off-centre, the handing shall be described by the pivot position in relation to the portion opening out. The portion opening outwards shall be stated.

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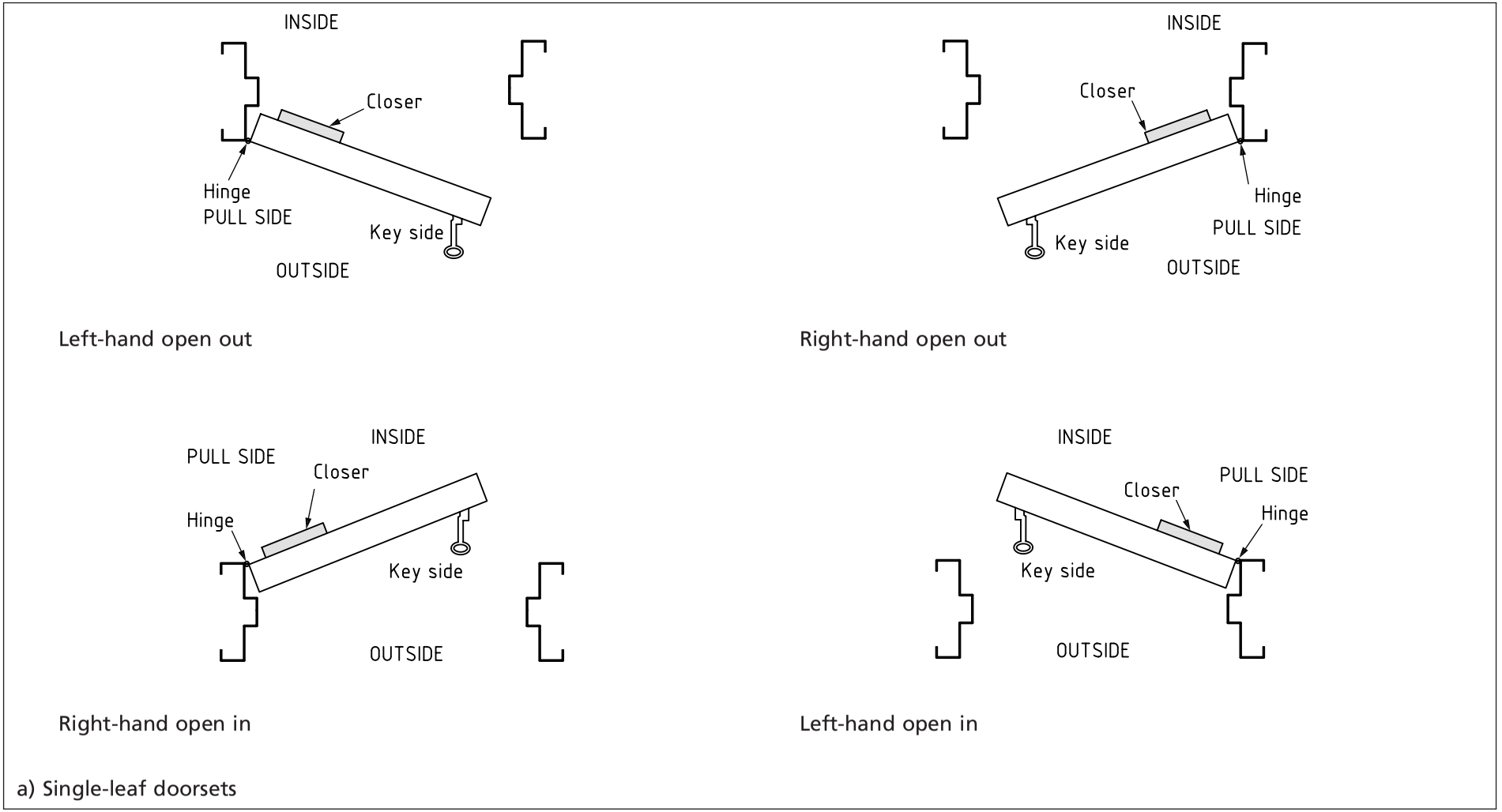
Figure A.1 **Specification for handing of doorsets** *(1 of 2)*



a) Single-leaf doorsets

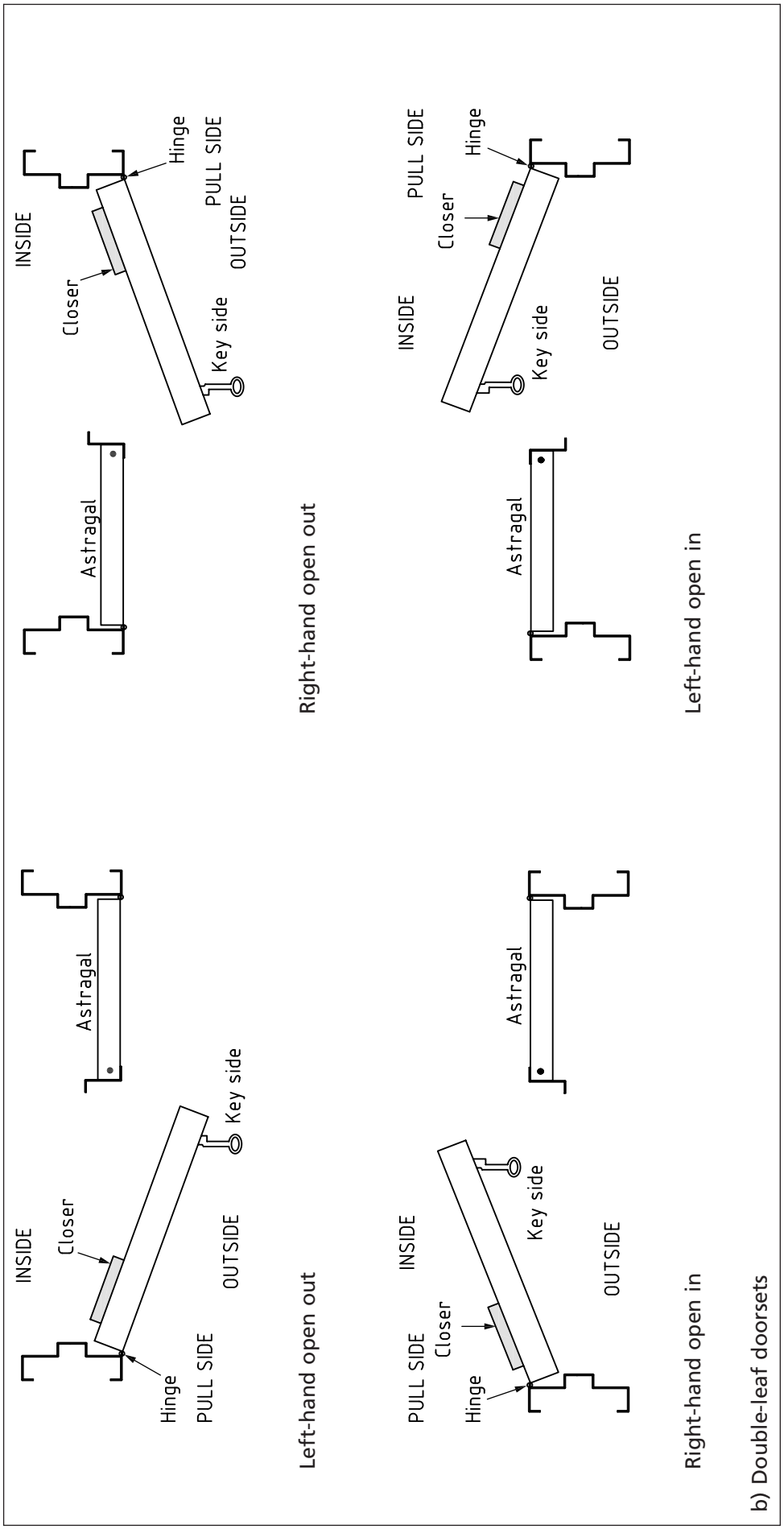


Figure A.1 **Specification for handing of doorsets** *(2 of 2)*

Annex B (informative) Additional guidance on the construction of door leaves

B.1 General

Steel doors, often referred to as metal doors, are normally supplied complete with a steel profiled frame and are now designated as steel doorsets. The door leaves are normally designed to give a flush face with any joints hidden within the reveal of the frame. However, large size door leaves might result in the need for face joints where the size exceeds the maximum steel sheet size available. The top and bottom of the door has a flush or inverted channel section to make it a "box" section.

Steel door leaves are made from flat steel sheet which is "pierced" with holes and cut-outs for hinges, locks and vision panels prior to being folded and assembled.

A typical steel door assembly is shown in Figure B.1.

B.2 Lock seam

This type of construction is in the form of a "tray and lid" where the visible joint is a locked seam.

A typical section through a flush double doorset is shown in Figure B.2.

NOTE The construction of the door may vary according to material thickness or performance criteria.

B.3 Seamless

For certain applications, such as clean rooms, the edges of the door are spot welded and filled or continuously welded and smoothed to give a seamless appearance.

B.4 Over-rebated

Some types of door include a rebated edge which overlaps the door frame. A plan of a typical over-rebated doorset is shown in Figure B.3.

B.5 Door leaf cores

In order to infill the void in the middle of the steel box section a number of different materials are used as a core dependent on the location and application of the final doorset such as, thermal, acoustic, fire and security performance.

B.6 Honeycomb

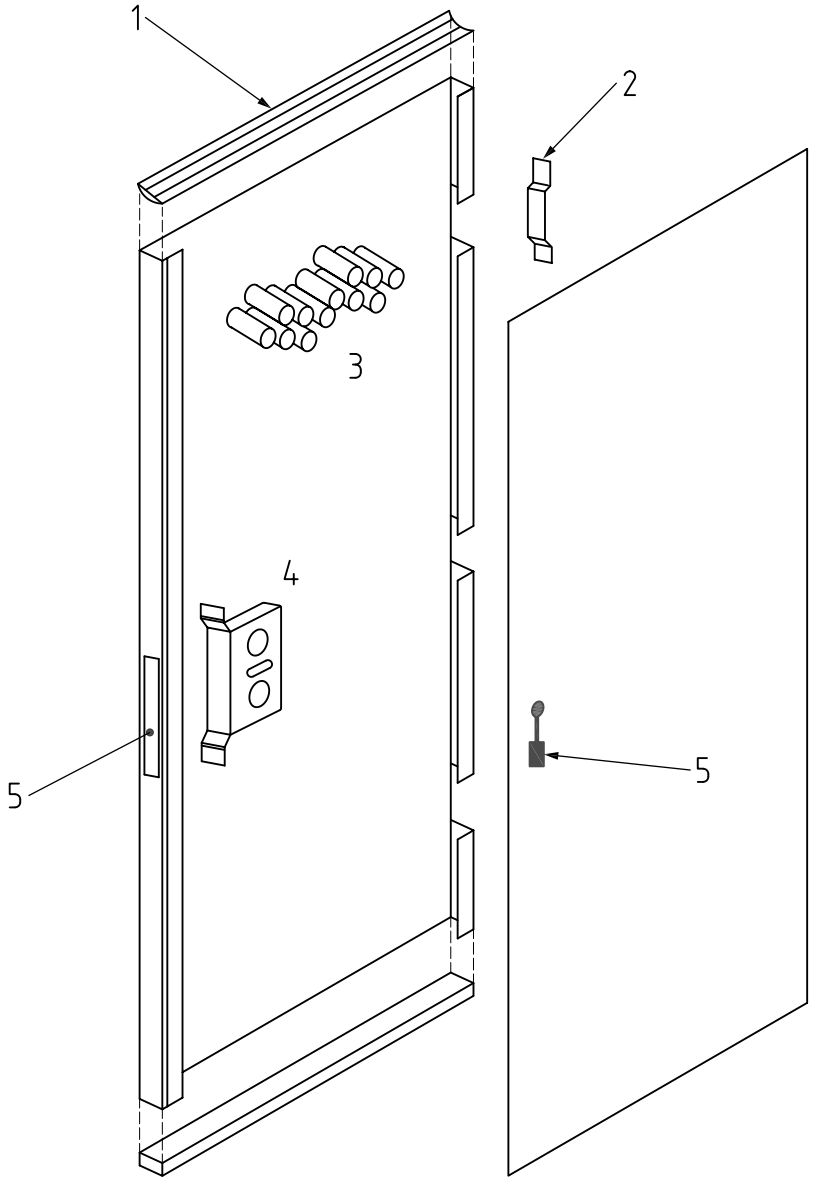
Most commercially available steel doors use this material for the core. The material is impregnated cardboard bonded to the steel skins during the manufacturing process giving a rigid and strong product weighing only 25 kg/m^2.

This type of construction allows cutting of apertures for vision panels or ventilation devices and is used on fire and non-fire doors.

B.7 Stiffened

Where the core of the door is not rigid e.g. mineral wool or other insulation material the steel skins need to be reinforced using stiffeners. These can be vertical or horizontal in the form of a grid. The stiffeners are normally profiled and either spot welded or bonded to the steel skins and the insulation material fitted in the spaces between.

Figure B.1 **Typical steel door assembly**



Key

1 Reinforcement channel fixed at top and bottom
2 Hinge reinforcement
3 Core
4 Lock reinforcement box
5 Cut outs pierced in flat steel sheet before folding of door panels

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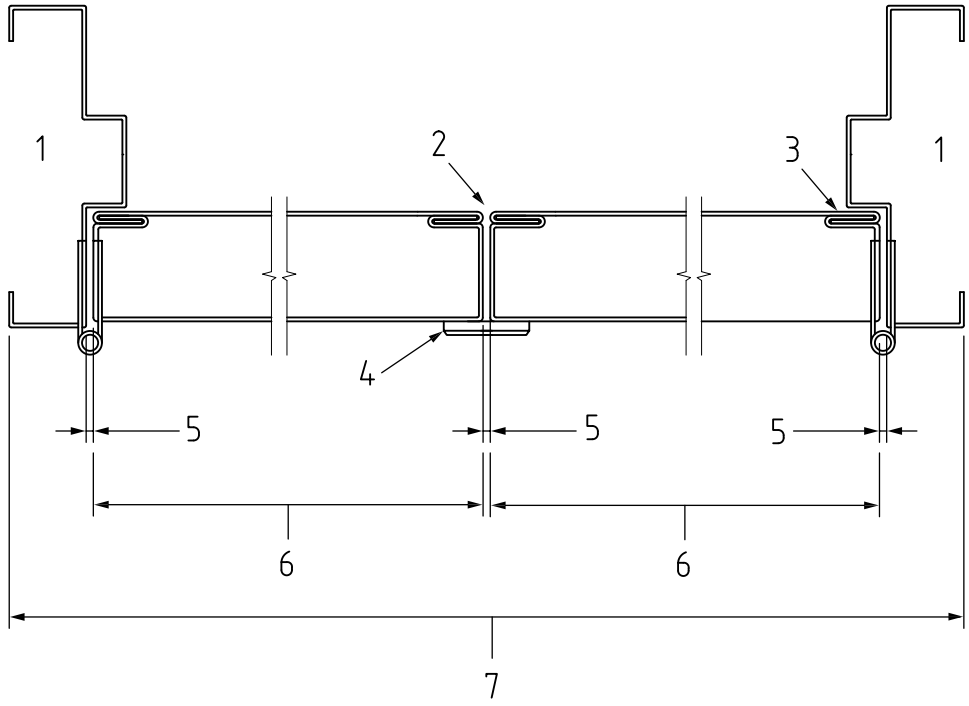
Figure B.2 **Typical section through flush double doorset**



Key

1 Hinge jamb

2 Meeting stiles can have an astragal as an integral part of the door leaf or added separately if required

3 Lock seam joint

4 Added astragal

5 Typical gap (3 mm at hinges, 4 mm to 6 mm at meeting stiles)

6 Leaf width

7 Overall frame width

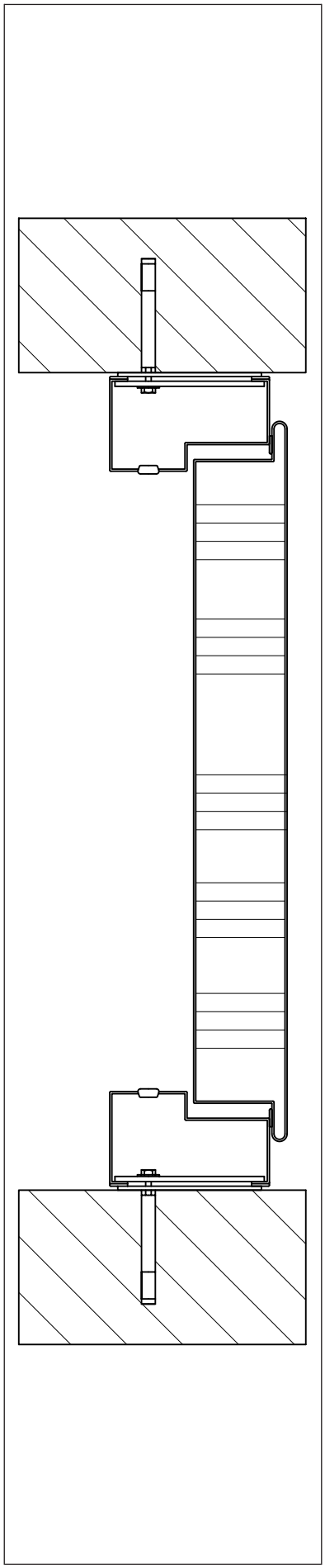


Figure B.3 **Plan of a typical over-rebated doorset**

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Standards publications

For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 8213-4, *Windows, doors and rooflights – Part 4: Code of practice for the survey and installation of windows and external doorsets*

BS 8300, *Design of buildings and their approaches to meet the needs of disabled people – Code of practice*

BS EN 14351-1, *Windows and pedestrian doorsets – Product standard, performance characteristics – Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics* [3)]

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[1] EUROPEAN COMMUNITIES. 89/106/EEC. Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products. Luxembourg: Office for Official Publications of the European Communities, 1988.

[2] GREAT BRITAIN. Building Regulations 2010. London: The Stationery Office.

[3] SCOTLAND. Building (Scotland) Regulations 2004 and subsequent amendments. Edinburgh: The Stationery Office.

[4] GREAT BRITAIN. Building Regulations (Northern Ireland) 2000 and subsequent amendments. Belfast: The Stationery Office.

[5] GREAT BRITAIN. *The Building Regulations 2000 – Approved Document B – Fire safety*. (Volumes 1 and 2.) London: The Stationery Office, 2007.

[6] STATIONERY OFFICE. *The Building Regulations 2000 – Approved Document M – Access to and use of buildings*. 2004 edition. London: The Stationery Office, 2006.

[3)] Part 2 is in preparation. Part 3 (also in preparation) has been redesignated prEN 16034.

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