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Aluminium alloy windows and doorsets – Specification

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Contents

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 16, an inside back cover and a back cover.

Foreword

Publishing information

This British Standard is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 29 February 2016. It was prepared by Subcommittee B/538/1, *Windows and Doors.* A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 4873:2009, which is withdrawn.

Relationship with other publications

The requirements and properties for aluminium window and door extrusions are specified in BS EN 755-1, BS EN 755-2, BS EN 755-9, BS EN 12020-1 and BS EN 12020-2.

This British Standard also relates to the following standards.

a) 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.

b) The BS 6375 series are the national application documents in the UK, giving performance requirements and guidance for the selection of appropriate classes of performance from BS EN 14351-1.

c) BS 8213-4 provides guidance on the survey and installation of windows and external pedestrian doorsets.

Information about this document

This is a full revision of the standard, and introduces changes which take into account:

a) the development of window and doorset design; and

b) the publication of new and revised European Standards.

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.

Requirements in this standard are drafted in accordance with *Rules for the structure and drafting of UK standards*, subclause **J.1.1**, which states, "Requirements should be expressed using wording such as: 'When tested as described in Annex A, the product shall ...'". This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

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.

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1 Scope

This British Standard specifies requirements for the design, construction and performance of aluminium alloy windows and external pedestrian doorsets, thermally or non-thermally improved, including constituent materials and glazing.

This British Standard does not apply to composite doorsets as defined in BS 8529, but it does cover doorsets that are predominantly aluminium framed (stile and rail construction) with replaceable composite panels.

This British Standard applies to windows and doorsets fabricated in a factory, to be installed vertically (±15°) into the external face of buildings, as single or multi-light units, or in coupled assemblies where appropriate, of the following types:

a) windows:
   1) hinged: side-hung, top-hung, bottom-hung, tilt before turn or turn before tilt;
   2) projecting: side-hung and top-hung (including reversible windows);
   3) pivoted: horizontal and vertical;
   4) sliding: horizontal and vertical (including tilting-in sash to vertical);
   5) fixed lights;
   6) fixed casement;
   7) parallel opening;
   8) double opening French casement;
   9) louvred, adjustable;

b) doorsets:
   1) single leaf, single-swing or double-swing hinged or pivoted doors with or without side lights and top lights;
   2) double leaf, single-swing or double-swing hinged or pivoted doors with or without side lights and top lights;
   3) sliding doors (includes tilt and slide and lift and slide doors);
   4) sliding folding doors.

This British Standard is applicable to windows in which a casement or sash frame member is no longer than 3 m and in which a door leaf frame member is no longer than 3.5 m. This British Standard does not apply to curtain walls that span across horizontal structural members of floors, but it is applicable to windows or doorsets fitted within a curtain walling system.

This British Standard is not applicable to secondary windows applied to convert existing single windows into double or coupled windows.

NOTE Guidance on the evaluation of conformity is given in Annex A. Guidance on durability and recycling is given in Annex B.

2 Normative references

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

BS 3987, *Specification for anodic oxidation coatings on wrought aluminium for external architectural applications*

BS 4255-1, *Rubber used in preformed gaskets for weather exclusion from buildings – Part 1: Specification for non-cellular gaskets*

BS 4842, *Specification for liquid organic coatings for application to aluminium alloy extrusions, sheet and preformed sections for external architectural purposes, and for the finish on aluminium alloy extrusions, sheet and preformed sections coated with liquid organic coatings*

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

BS 6100-6, *Building and civil engineering – Vocabulary – Part 6: Construction parts*

BS 6100-11, *Building and civil engineering – Vocabulary – Part 11: Performance characteristics, measurement and joints*

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

BS 6262-1, *Glazing for buildings – Part 1: General methodology for the selection of glazing*

BS 6262-2, *Glazing for buildings – Part 2: Code of practice for energy, light and sound*

BS 6262-3, *Glazing for buildings – Part 3: Code of practice for fire, security and wind loading*

BS 6262-4, *Glazing for buildings – Part 4: Code of practice for safety related to human impact*

BS 6262-7, *Glazing for buildings – Part 7: Code of practice for the provision of information*

BS 6375-1, *Performance of windows and doors – Part 1: Classification for weathertightness and guidance on selection and specification*

BS 6375-2, *Performance of windows and doors – Part 2: Classification for operation and strength characteristics and guidance on selection and specification*

BS 6375-3, *Performance of windows and doors – Part 3: Classification for additional performance characteristics and guidance on selection and specification*

BS 6496, *Specification for powder organic coatings for application and stoving to aluminium alloy extrusions, sheet and preformed sections for external architectural purposes, and for the finish on aluminium alloy extrusions, sheet and preformed sections coated with powder organic coatings*

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

BS EN 485-2:2013, *Aluminium and aluminium alloys – Sheet, strip and plate – Part 2: Mechanical properties*

BS EN 755-2:2013, *Aluminium and aluminium alloys – Extruded rod/bar, tube and profiles – Part 2: Mechanical Properties*

BS EN 755-9:2008, *Aluminium and aluminium alloys – Extruded rod/bar, tube and profiles – Part 9: Profiles, tolerances on dimensions and form*

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

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

BS EN 1991-1-4, *Eurocode 1: Actions on structures – Part 1-4: General actions – Wind actions*

BS EN 12020-1:2008, *Aluminium and aluminium alloys – Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 – Part 2: Technical conditions for inspection and delivery*

BS EN 12020-2:2008, *Aluminium and aluminium alloys – Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 – Part 2: Tolerances on dimensions and form*

BS EN 12206-1, *Paints and varnishes – Coating of aluminium and aluminium alloys for architectural purposes – Part 1: Coatings prepared from coating powder*

BS EN 12365-1, *Building hardware – Gasket and weatherstripping for doors, windows, shutters and curtain walling – Part 1: Performance requirements and classification*

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 7599, *Anodizing of aluminium and its alloys – General specifications for anodic oxidation coatings on aluminium*

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

BS EN ISO 11600, *Building construction – Jointing products – Classification and requirements for sealants*

3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS 6100-1, BS 6100-6, BS 6100-11, BS 6100-12, BS EN 12519 and the following apply.

3.1 bearing device
wheel, roller, skid or other device fitted at the head or sill of a horizontally sliding window or door to support the mass of the sash or door leaf and to facilitate movement

3.2 casement
framed window light that is hinged, pivoted or fixed

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

NOTE Screws, machine screws, washers and rivets are often referred to as fasteners.

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

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

3.6 insulating glass unit
assembly consisting of at least two panes of glass, separated by one or more spacers, hermetically sealed along the periphery, mechanically stable and durable

NOTE Systems are available where the spacer and hermetic seal are included within a single edge sealing system.

[Source: BS EN 1279-1:2004, **3.1**]

3.7 multi-light
window incorporating two or more lights, opening and/or fixed, within one perimeter frame

3.8 secondary window
window either fitted into the same wall opening as an existing window, or applied to an existing window, to provide improved thermal and/or sound insulation

3.9 ventilation device
ventilator other than an opening light incorporated into a window or 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 or background ventilator in the UK.

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

NOTE A weatherseal is sometimes called a weatherstrip.

3.11 weathertightness
performance in respect of air permeability, watertightness and wind resistance

4 Handing

The handing shall be in accordance with the specification provided to the manufacturer.

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

*NOTE Where the manufacturer is not specifying the handing, the handing specification should be checked and confirmed (see **C.1**).*

5 Components

5.1 Aluminium extrusions and sheet products

Extruded aluminium profiles shall be fabricated from designated alloys 6060 or 6063 in tempers T5 or T6 conforming to BS EN 755-2:2013 and BS EN 755-9:2008 or BS EN 12020-1:2008 and BS EN 12020-2:2008, as appropriate.

When ancillary components such as sills, couplings, etc. are formed from sheet materials, they shall be fabricated from designated alloys 1200, 3103, 5005 or 5251 conforming to BS EN 485-2:2013 in a temper suitable for the particular type of application and degree of forming to be adopted.

The aluminium profiles used in the construction of the frames excluding glazing beads, nibs, interlocks and similar features shall be not less than 1.2 mm thick.

NOTE This dimension takes into account any tolerances specified in the product standards or other industry standards

The aluminium shall be finished by one of the following:

a) anodizing conforming to BS 3987 or BS EN ISO 7599;

b) liquid organic coating conforming to BS 4842; or

c) powder coating conforming to BS 6496 or BS EN 12206-1.

5.2 Frame joint sealing materials

After the window or doorset has been tested in accordance with BS 6375-1 and BS 6375-2, there shall be no degradation of the sealing or the operational function of the window due to failure of the sealing materials.

NOTE Materials should be able to withstand stresses during assembly, transportation, installation and operation of the window.

5.3 Bearing devices and hardware

Metallic materials used for bearing devices and hardware shall have at least the equivalent corrosion resistance to BS EN 1670, grade (class) 3 (96 h) when subjected to the neutral salt spray test in accordance with BS EN ISO 9227. Tests shall be carried out on complete hardware items as supplied.

NOTE 1 For environments in very polluted localities such as those subject to combinations of industrial and coastal pollution, BS EN 1670, class 4 should be used.

NOTE 2 Requirements and test methods for hardware materials are specified in BS EN 13126.

5.4 Glazing gaskets and weatherseals

Glazing gaskets and weatherseals shall:

a) conform to BS 4255-1 or BS EN 12365-1;

b) be capable of easy replacement;

c) be fitted securely in accordance with the supplier's instructions;

d) have a guaranteed life of 10 years; and

e) when supplied loose for site fixing, be supplied with appropriate fixing information.

NOTE BS EN 12365-1 gives European test methods for evaluating gaskets and weatherstripping, and DD 8455 provides advice on interpreting this standard for UK use.

Glazing compounds shall be non-setting compounds, preformed mastic tapes, gun grade solvent release type sealants, one-part or two-part curing sealants or two-part rubberizing compounds. Gun grade sealants shall conform to BS EN ISO 11600.

5.5 Fixings

All straps, clips, brackets, lugs, and similar fixing devices and their attendant screws and bolts, shall be capable of meeting the applied wind and operational loads and shall achieve a minimum corrosion resistance of grade (class) 3 (96 h) as specified in BS EN 1670.

NOTE 1 Screws, nuts, bolts, rivets, metal washers, shims and other fixings should be tested in the as used condition.

NOTE 2 Spacer shims used at fixings, which serve only as packing and do not influence the structural integrity of the fixing, may be of extruded or moulded plastics material.

NOTE 3 Austenitic stainless steel is the preferred material for fixings subject to external forces and corrosive influences.

5.6 Glass

Glass thickness and type shall be selected using the recommendations given in BS 6262-1, BS 6262-2, BS 6262-3, BS 6262-4 and/or BS 6262-7, as appropriate, to withstand the design wind pressure calculated in accordance with BS 6375-1 or BS EN 1991-1-4.

The exposed edges of glass adjustable louvre blades shall be arrised, ground or polished.

Insulating glass units shall conform to BS EN 1279.

6 Construction and design

6.1 General

The accessible parts of finished windows shall, as far as reasonably practicable, be free from all sharp edges and burrs.

6.2 Work sizes

The work sizes for overall length and height shall be documented.

6.3 Manufacturing tolerances

The size of an assembled frame shall be within ±1.5 mm of the documented work size (see **6.2**), and the difference between the diagonals of the assembled frame shall be not greater than 4 mm.

NOTE Where available, system design tolerances should be followed.

6.4 Design for glazing

The frame design shall be such that:

a) the window or doorset can be glazed in accordance with BS 6262;

b) reglazing is possible without the need to remove the outer frame from the structure of the building;

c) it is possible to renew the weatherseals without removing the outer frame from the structure of the building; and

d) it is possible to replace the hardware without removing the outer frame from the structure of the building.

6.5 Openable windows and doors

For windows and doors that are intended to be openable, the opening sashes or door leaves however designed shall move freely and smoothly without hindrance throughout their intended range of movement.

In horizontally and vertically sliding windows and sliding doors, adjacent aluminium members shall not slide upon each other.

In horizontally sliding windows and sliding doors, the sashes or door leaves shall be supported on bearing devices that facilitate movement and prevent direct contact between the sash and the track.

In vertically sliding windows, the mechanism or balancing device shall be accessible for adjustment, repair or replacement, after the windows have been installed.

6.6 Frame joints

Joints in frames shall be made either by welding or by mechanical means (e.g. cleating, screwing and gluing) and shall have flush, stepped or lapped surfaces. For flush joints formed by mechanical means, any deviation from the same plane shall be within the limits set by the use of extrusion tolerances given in BS EN 755-9 or BS EN 12020-2.

NOTE The use of L shaped plates (chevrons) in mitred joints should be used to help achieve the required finish, and the weather performance of metal-to-metal joints benefit from the application of suitable sealing compounds during manufacture.

Welded joints shall be cleaned off smooth on surfaces that are exposed when the window is in the closed position and where the joints would otherwise project into the glazing space.

7 Glazing

Windows and doorsets shall be glazed in accordance with the relevant part of the BS 6262 series and BS 8000-7.

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

8 Use, cleaning and maintenance

Guidance on the use, cleaning and maintenance of aluminium windows and doorsets shall be provided by the manufacturer to the customer.

9 Security

9.1 Basic security

When a completed window or doorset is subjected to the basic security test specified in BS 6375-3, it shall not be possible to gain entry.

9.2 Enhanced security

When enhanced security is required, windows and doorsets shall conform to BS 6375-3.

NOTE Guidance on security against crime is given in BS 8220.

10 Safety in case of fire

10.1 Fire resistance

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

10.2 Reaction to fire

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

NOTE Aluminium is rated as Class A1 by the European Commission.

11 Safety in use

11.1 Impact resistance

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

11.2 Safety devices

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

NOTE BS 8213-1 gives guidance on the safety in use and in cleaning of windows and door height windows.

11.3 Ability to release for doors on escape routes

Emergency exit devices or panic devices shall conform to BS 6375-3.

12 Weathertightness

The completed window or doorset shall meet the weathertightness requirements for the appropriate classification specified in BS 6375-1, when tested in accordance with BS 6375-1 and, for double windows, with the appropriate additional procedure given below.

a) For air permeability, double windows shall be tested with both windows closed, the length of opening joint being that which is visible on the inner surface of the inner window only.

b) For watertightness, double windows shall be tested with both windows closed and the performance class shall be that obtained by the outer windows.

c) For wind resistance, double windows shall be tested with the inner window open and the outer window closed. The test shall then be repeated with the inner window closed and, if the outer window contains opening light(s), this (they) shall be opened.

13 Operation and strength characteristics

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

14 Hygiene, health and the environment

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

NOTE 1 Attention is drawn to the 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 window or doorset during normal intended use.

NOTE 3 Thermal bridging should be avoided when selecting the type of ventilator.

15 Acoustic performance

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

16 Energy conservation

The U value shall be declared in accordance with BS 6375-3.

NOTE Window and doorset energy ratings are outside the scope of this standard.

17 Marking

Each window or door shall be marked with:

a) the number and date of this British Standard, i.e. BS 4873:2016 [1)];

b) claimed performance classifications;

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

d) means of traceability.

The identification shall be affixed to at least one of the following:

1) any suitable part of the product;

2) on an attached label;

3) on its packaging;

4) on the accompanying commercial documents;

5) on the manufacturer's website; or

6) in the manufacturer's published technical specifications.

[1)] Marking BS 4873:2016 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 solely the claimant's responsibility. Such a declaration is not to be confused with third-party certification of conformity.

Annex A (informative) Guidance on the evaluation of conformity

A.1 Selection of samples for type approval

When considering a product range of windows or doorsets for testing and approval with a view to selecting representative samples, the following aspects should be taken into account:

a) the size of the window:

   1) largest area top-hung with the longest length;
   2) largest area side-hung with the tallest height;
   3) maximum area fixed light for the weathertightness classification being considered;
   4) maximum area casement multi-light with the longest continuous mullion/transom for the weathertightness classification being considered;
   5) maximum area tilt before turn or turn before tilt;
   6) maximum area tilt before turn or turn before tilt multi-light with longest continuous mullion or transom for the weathertightness classification being considered;
   7) largest area horizontal pivot with longest width;
   8) largest area vertical pivot with tallest height. If an offset pivot is available, this should be selected instead of a centre pivot. A centre pivot window should be selected to represent windows with an opening ratio of two thirds to one third;
   9) maximum area horizontal slider with the tallest height;
   10) maximum area vertical slider with longest length;
   11) maximum area parallel opening window;

b) the size of the doorset:

   1) maximum area hinged or pivoted doorset with longest width;
   2) maximum area sliding or sliding/folding doorset with tallest height;

c) general:

   1) classification under weathertightness and mechanical testing;

      NOTE This might be affected by the size of products tested. The effects of loading are generally greater on components of greater size. A product range can be given more than one rating according to the size of components used.

   2) internal/external beaded systems;
   3) wrap around glazing system;
   4) glazing – single, double or triple glazed – consider the window or doorset having the thinnest glass with the maximum area for the wind loading classification being considered (if applicable);
   5) single or multi-point locking and various systems. When considering single lights with multi-point locking systems, the greatest value of opening perimeter should be divided by the total number of locking points;
   6) hingeing and roller systems/suppliers; and
   7) other hardware used to support the weathertightness/mechanical performance.

All of these details should be made available in the manufacturer's fabrication manual.

A.2 Testing schedule

Type tests in accordance with this standard should be carried out initially (i.e. at first assessment of the range) and at significant changes to the window or doorset construction.

NOTE See BS EN 14351-1:2006+A1:2010, Table A.1 for examples of significant changes.

Annex B (informative) Durability and recycling

*COMMENTARY ON **ANNEX B***

The durability of aluminium windows and doorsets is affected by:

a) the specification of the framing, glazing and associated materials;

b) the specification of the hardware used;

c) the quality of manufacture and assembly;

d) the quality of the installation;

e) the use and abuse; and

f) the maintenance of the products.

Due to these variables, actual performance can vary in use such that any figures given for service life can only be general estimates. Such figures bear no relationship to warranties given by the manufacturer(s).

A window or doorset is considered to have failed when it is no longer possible to repair or replace components or hardware, and the physical integrity has been lost.

B.1 Components

B.1.1 Frames

Aluminium extrusions finished in accordance with BS 3987, BS 6496 or BS EN 12206-1 should be wiped down annually with warm soapy water, unless they are in an area of high salt or industrial contamination where extra cleaning is needed.

Where window or doorset frames are thermally improved by the inclusion of an insulating barrier or cladding, the insulating material should be stable under the conditions of service, e.g. under wind and dead loads and within the likely surface temperature range of the frames.

The thermal barrier or cladding system should be sufficiently robust to withstand tests carried out in accordance with BS 6375-1 and BS 6375-2.

NOTE 1 BS 6375 specifies performance requirements for the strength of windows based on a series of mechanical tests that check the integrity of the frame.

NOTE 2 The thermal barrier may be of polyurethane resin (for poured-in-place systems), neoprene extrusions, or PVC-U, nylon, polypropylene or polyamide extrusions, used with rigid foam plastics. The thermal cladding may be of PVC-U or rigid foam PVC extrusions.

NOTE 3 Requirements for thermal barriers are specified in BS EN 14024.

NOTE 4 Aluminium alloy products have been used in buildings for more than 60 years and are still fitted today; windows and doorsets that conform to this British Standard can be expected to last that length of time under normal usage conditions.

For aluminium/timber composites and timber surrounds, the aluminium element should conform to the requirements specified in this British Standard. The timber element should conform to the following guidance.

If timber sections are used, either as a surrounding frame or as part of the window frame, they should conform to BS EN 942 and the workmanship should conform to BS 1186-2. The materials used in their preservation treatment should have no harmful effects on aluminium in contact with the treated timber.

There should be no direct contact between mill finish aluminium and oak, sweet chestnut or western red cedar because of the acid content in the timbers.

NOTE 5 See BS 644 for a full description of the requirements for the selection, fabrication and installation of timber windows.

B.1.2 Insulating glass units (IGU)

Insulating glass units should be replaced without removing the outer frame from the fabric of the building.

NOTE Insulating glass units manufactured in accordance with BS EN 1279 can last in excess of 20 years if they are correctly glazed into the frame.

B.1.3 Glazing gaskets and weatherseals

*COMMENTARY ON **B.1.3***

Over time, the performance of glazing gaskets and weatherseals can decline and they might need replacing after 10 to 20 years. They can be replaced without removing the outer frame from the fabric of the building. Whilst it might prove impossible or impractical to replace glazing gaskets and weatherseals with exact replicas, most gasket manufacturers carry a sufficiently wide range of gaskets to ensure that a near match can be achieved which enables the performance of the window to be maintained.

Glazing gaskets and weatherseals manufactured in accordance with BS 4255-1 or BS EN 12365-1, when correctly applied, should help to ensure the weathertightness of the window or door.

B.1.4 Hardware and fixings

*COMMENTARY ON **B.1.4***

Hardware is generally designed and supplied to perform a particular function at a specific performance level. As many items are unique to a system and even a profile, the correct specification or part number should be specified when ordering replacements, particularly when a product has been discontinued. Always choose hardware made from materials that can cope with the actual conditions: for example, marine, swimming pool and some industrial environments are more demanding and higher grade materials, such as austenitic stainless steel, and enhanced finishes are recommended.

Fixings should be correctly chosen with due note taken of the environment and their intended usage.

NOTE Stainless steel fixings are generally preferred for aluminium products.

B.2 Installation and maintenance

Products should be correctly installed to ensure adequate weather performance.

NOTE BS 8213-4 gives guidance on the survey and installation of windows and doorsets in dwellings, but the principles are valid for most types of buildings.

Regular maintenance should be carried out in accordance with the manufacturer's and/or systems company's recommendations to ensure that product performance, appearance and durability are maximized (see Clause **8**).

B.3 Recycling

Aluminium windows and doorsets should be recycled at the end of their life. In-process aluminium scrap is also a valuable commodity and should be collected and returned to a suitable remelting facility.

The aluminium components are fully recyclable, back to the original material specification if desired, with very small losses, low energy input and minimal greenhouse gas output, thus every effort should be made to ensure their collection and return to a suitable refiner.

NOTE Glass, gasket material and PVC-U trims can also be recycled.

Annex C (normative) Specification for handing

C.1 View

When specifying handing, the window or doorset shall be viewed from the outside.

NOTE 1 Drawing conventions for window and doorset types are illustrated in Figure C.1 and Figure C.2. The European designations (BS EN 12519) are significantly different and the specification being used should be stated.

NOTE 2 Secondary windows are usually identified viewed from the inside.

C.2 Side-hung windows

The handing of side-hung windows or doorsets shall be described by the hinge position when viewed from outside.

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

C.3 Vertically pivoted windows

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

C.4 Multi-lights

The handing of a multi-light shall be clearly described when viewed from outside.

NOTE A drawing or diagram is useful.

Figure C.1 **UK drawing conventions for window types**

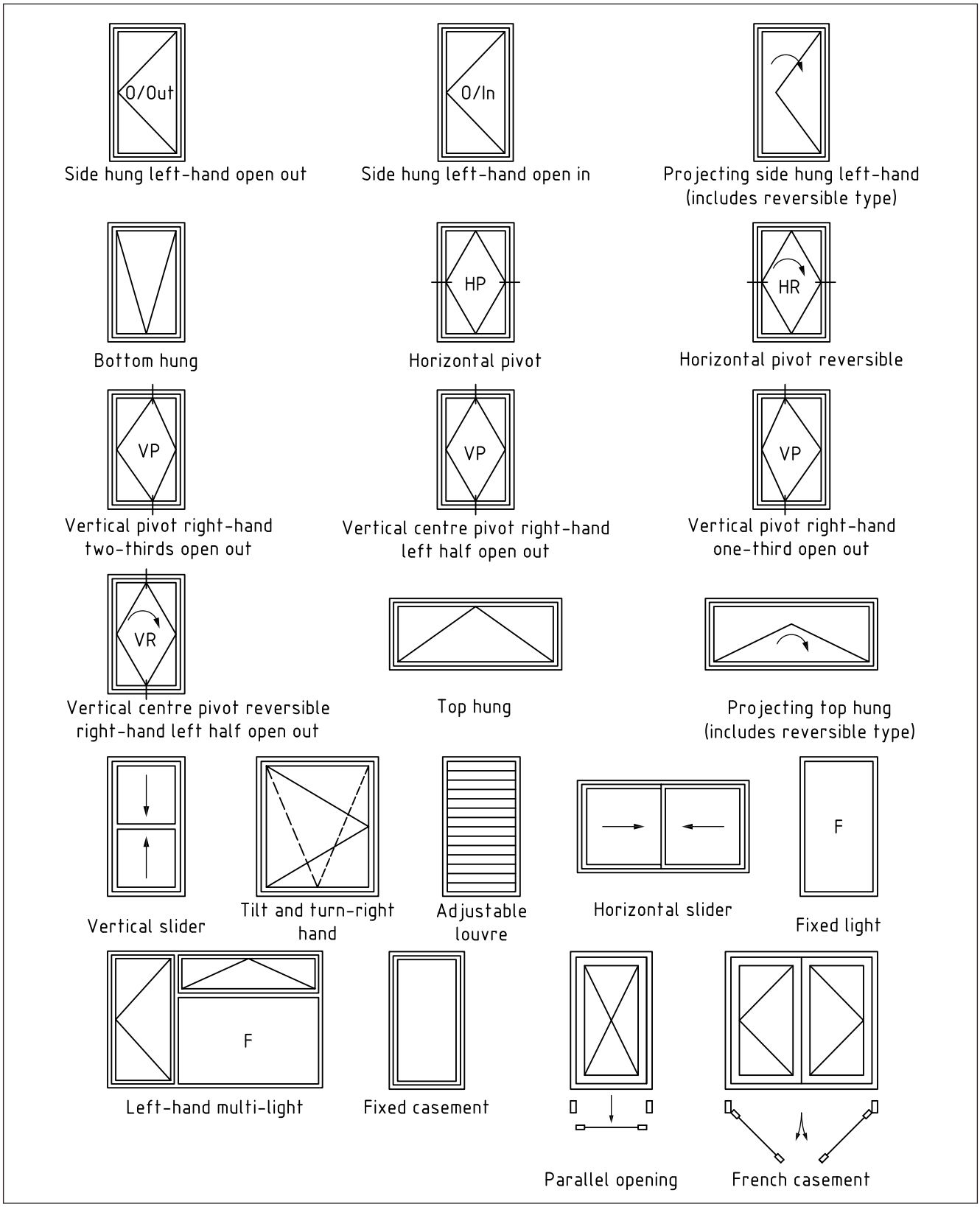
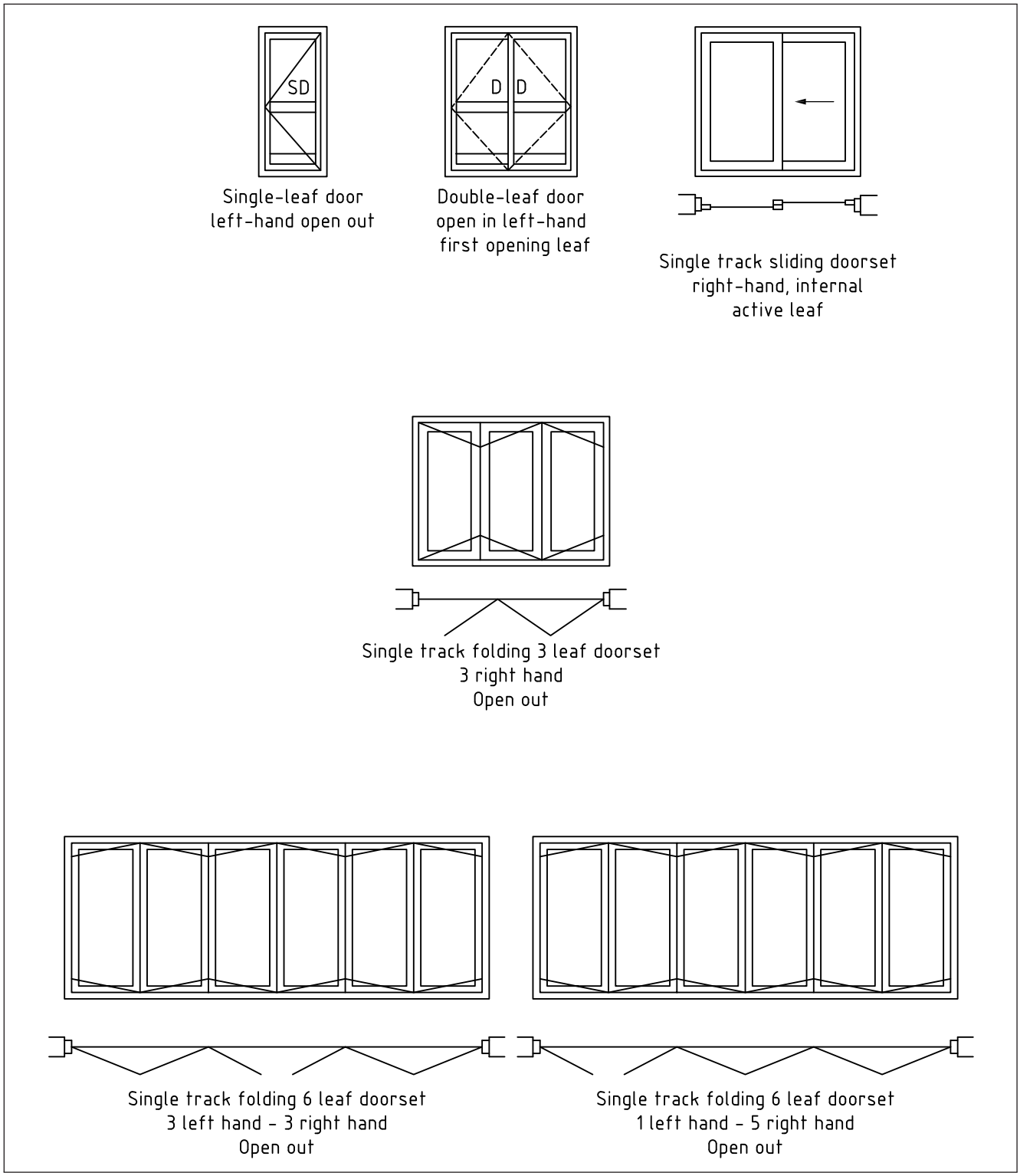


Figure C.2 **UK drawing conventions for doorset types**



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BS 644, *Timber windows – Fully finished factory-assembled windows of various types – Specification*

BS 1186-2, *Timber for and workmanship in joinery – Part 2: Specification for workmanship*

BS 8213-1, *Windows, doors and rooflights – Part 1: Design for safety in use and during cleaning of windows, including door-height windows and roof windows – Code of practice*

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

BS 8220 (all parts), *Guide for security of buildings against crime*

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BS EN 14351-1+A1:2010, *Windows and doors – Product standard, performance characteristics – Part 1: Windows and external pedestrian doorsets without resistance to fire and/or smoke leakage characteristics* [2)]

DD 8455, *Materials for gaskets and weatherstripping for windows, doors, conservatories and curtain walling – Requirements and test methods*

Other publications

[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)] At the time of publication, part 2 was in preparation.

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