BS 8529:2017

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Composite doorsets

Domestic external doorsets – Specification

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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 31 August 2017. It was prepared by Technical Committee B/538/1, *Windows and doors*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This British Standard supersedes BS 8529:2010, which is withdrawn.

Relationships with other publications

This British Standard is related to the following standards.

a) BS 6375 (all parts) 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.

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

c) 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.

d) BS EN 16034 is the harmonized European Standard detailing the fire-resistant and smoke control performance characteristics for windows and doorsets. This standard is used in conjunction with BS EN 14351-1 to provide a full list of characteristics that external doorsets can have. All characteristics shown in BS EN 16034, unlike those shown in BS EN 14351-1, are essential characteristics and can be declared when placing a fire-resisting and/or smoke control doorset on the European market in accordance with the Construction Products Regulation [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.

Requirements in this standard are drafted in accordance with *Rules for the structure and drafting of UK standards*, subclause **G.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.

Attention is drawn to the Building Regulations 2010 and subsequent amendments [2], the Building (Scotland) Regulations 2004 [3] and the Building Regulations (Northern Ireland) 2012 [4].

1 Scope

This British Standard specifies requirements for the design, construction and performance of domestic external composite doorsets.

This British Standard applies to the following types of doorset:

a) hinged side-hung single leaf (handed); and

b) hinged double leaf.

This British Standard is applicable to doors that are supplied fully finished, part finished or unfinished.

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 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.

Standards publications

BS 644, *Timber windows and doorsets — Fully finished factory-assembled windows and doorsets of various types — Specification*

BS 4873, *Aluminium alloy windows and doorsets — Specification*

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 6262-6, *Glazing for buildings — Part 6: Code of practice for special applications*

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

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

BS 6375-2:2009, *Performance of windows and doors — Classification for operation and strength characteristics and guidance on selection and specification*

BS 6375-3:2009+A1:2013, *Performance of windows and doors — Classification for additional performance characteristics and guidance on selection and specification*

BS 7412, *Specification for windows and doorsets made from unplasticized polyvinyl chloride (PVC-U) extruded hollow profiles*

BS 7722:2010, *Surface covered PVC-U profiles for windows and doorsets — Specification*

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

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

BS EN 515, *Aluminium and aluminium alloys — Wrought products — Temper designations*

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

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

BS EN 942:2007, *Timber in joinery — General requirements*

BS EN 1027:2000, *Windows and doors — Watertightness — Test method*

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

BS EN 12020 (all parts), *Aluminium and aluminium alloys — Extruded precision profiles in alloys EN AW-6060 and EN AW-6063*

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 12608-1, *Unplasticized poly(vinyl chloride) (PVC-U) profiles for the fabrication of windows and doors — Classification, requirements and test methods — Part 1: Non-coated PVC-U profiles with light coloured surfaces*

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 14220, *Timber and wood-based materials in external windows, external door leaves and external doorframes — Requirements and specifications*

BS EN 14374, *Timber structures — Laminated veneer lumber (LVL) — Requirements*

BS EN ISO 105-A01:2010, *Textiles — Tests for colour fastness — Part A01: General principles of testing*

BS EN ISO 2813, *Paints and varnishes — Determination of gloss value at 20 degrees, 60 degrees and 85 degrees*

BS ISO 6707-1, *Buildings and civil engineering works — Vocabulary — Part 1: General terms*

PAS 24, *Enhanced security performance requirements for doorsets and windows in the UK — Doorsets and windows intended to offer a level of security suitable for dwellings and other buildings exposed to comparable risk*

Other publications

[N1] GLASS AND GLAZING FEDERATION. *Guidelines for the selection, installation, maintenance of hardware for the window and door industry.* Data sheet 6.7. London: Glass and Glazing Federation.

[N2] GLASS AND GLAZING FEDERATION. *Guidelines for the selection, installation and maintenance of screws and fasteners for the window and door industries.* Data sheet 6.8. London: Glass and Glazing Federation.

3 Terms and definitions

For the purposes of this British Standard, the terms and definitions given in BS ISO 6707-1, BS 6100-12, BS EN 12519 and the following apply.

3.1 composite door leaf

door leaf whose structure contains multiple materials, generally of sandwich construction, contributing to the structural performance of the product

3.2 composite doorset

hinged or pivoted doorsets with composite based leaf or leaves, with or without glazing in the leaf, and/or a composite door frame

NOTE 1 Doorsets with either the door leaf or the door frame manufactured from a composite material are considered to be composite doorsets and are covered by this British Standard. Composite doorsets may be of double rebate or single rebate construction.

NOTE 2 Composite doorsets are manufactured using a variety of components. The basic construction of a composite door leaf consists of a door carcass, internal and external door facings, and core material. See Clause 5.

3.3 core infill

material(s) providing the bulk of the internal core of the door leaf through its thickness (may be surrounded by a subframe or in one piece)

3.4 cycle

set of operations required to take a door from the closed and fully locked condition to the fully opened condition and back to the closed and fully locked position

3.5 decorative finish

outer layer of paint or material on the visible surface of the door leaf normally used for decorative and not structural purposes

3.6 door leaf

moving/opening element of the doorset (rotating/opening on the hinge)

3.7 doorset

complete door system, as installed, comprising door leaf or leaves, door frame, all hardware and any integral glazed side panel or over panel

3.8 facing

non-cellulosic composite/plastic, or steel material layer bonded/fixed to the core and/or subframe to the outer surface of the door leaf and forming part of the structure of the door leaf

NOTE Facings may be covered by a decorative finish.

3.9 fixing

component (typically a screw) 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 doorset into the structure of the building

3.10 glazing gasket

resilient material used between the glazing and the frame and/or between the glazing and the glazing bead designed to reduce air infiltration, and water, smoke and acoustic penetration

3.11 hardware

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

NOTE This is also known as ironmongery.

3.12 outer frame

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

NOTE The outer frame may also be used to support the glazing and/or solid panels in integral and/or coupled side lights or over lights.

3.13 subframe

structural elements around the perimeter of the door leaf

NOTE A subframe might not be present where a solid core construction is used.

3.14 ventilation device

ventilator 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 or background ventilator in the UK.

3.15 weatherseal

resilient material designed to reduce infiltration of air, water, smoke and/or sound between the door leaf and door frame

NOTE This is sometimes referred to as a weatherstrip.

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 A.

NOTE Where the manufacturer is not specifying the handing, the handing specification should be checked and confirmed. See Annex A.

5 Components

COMMENTARY ON CLAUSE 5

Door facings used in composite doorsets are made from a variety of materials. The performance of the facings can only be assessed by testing the whole doorset in accordance with the appropriate British Standard. Examples of materials successfully used include:

a) thermoplastic;

b) fibre reinforced thermosets;

c) steel; and

d) aluminium.

5.1 Doorset outer frame

Doorset outer frame materials used in composite doorsets shall, where applicable, conform to the appropriate product standards, including:

a) BS 7722:2010 or BS EN 12608-1 for unplasticized polyvinyl chloride (PVC-U);

b) BS EN 485-2, BS EN 515, BS EN 755-2, BS EN 755-9 or BS EN 12020 (all parts) for aluminium;

c) BS EN 10346:2009, coating Z275, for steel sheet or box section;

d) BS EN 942:2007 for solid timber, specifically class J50 for frames;

e) BS EN 14374 for engineered timber; and/or

f) BS EN 14220 for all timber products.

*NOTE There are new materials available for which no product standard has yet been published. Such materials may be used provided that the finished doorset meets the thermal cycling requirement specified in Clause **10**, together with any other requirements specific to the doorset's intended use (e.g. fire resistance).*

5.2 Composite door leaf

5.2.1 General

A composite door leaf shall consist of a door leaf subframe (referring to perimeter rails and stiles), internal and external door subfacings, facings and core material or a rigid one piece or laminated core with facings that negate the need for a separate subframe to run to the edge of the door leaf.

5.2.2 Subframe

A subframe shall be constructed from rails, inner and/or outer stiles of composite, plastic or wood materials bonded between the door facings.

NOTE 1 The exposed edges of the subframe may be exposed, untreated or covered with a decorative door edge facing. The subframe is a structural element of the door leaf, and may be designed to permit a calculated amount of sizing.

Door leaf subframe materials used in composite door leaves shall, where applicable, conform to the appropriate product standards, including:

a) BS 7722:2010 or BS EN 12608-1 for unplasticized polyvinyl chloride (PVC-U);

b) BS EN 485-2, BS EN 515, BS EN 755-2, BS EN 755-9 or BS EN 12020 (all parts) for aluminium;

c) BS EN 10346:2009, coating Z275, for steel sheet or box section;

d) BS EN 942:2007 for solid timber, specifically class J50 for frames; and/or

e) BS EN 14374 for engineered timber.

*NOTE 2 There are new materials available for which no product standard has yet been published. Such materials may be used provided that the finished doorset meets the thermal cycling requirement specified in Clause **10**, together with any other requirements specific to the doorset's intended use (e.g. fire resistance).*

5.2.3 Facing

Facing shall contain a composite, plastic or steel material layer(s) between the core and the decorative face in the leaf or panel and shall be an integral part of the door leaf.

NOTE The exposed face of the facing material may have an integral cosmetic appearance. Only steel facings with less than 1 mm thickness are included in this British Standard.

5.2.4 Decorative finish

Decorative finish, if included, shall have an outer layer of paint or material on the visible surface of the subfacing.

NOTE This is typically used for decorative purposes, not for structural or fire resistance purposes.

5.2.5 Core infill

Core infill shall be contained within the thickness of a door leaf which might consist of a single sheet of material or a combination either of sheets of the same material or layers of different materials or an insulating foam.

5.3 Glazing gaskets and weatherseals

5.3.1 Glazing gaskets and weatherseals for non-fire resistant doors

Gaskets and weatherseals shall:

a) conform to 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.

5.3.2 Glazing gaskets and weatherseals for fire resistant doors

Gaskets and weatherseals shall be in accordance with the doorset manufacturer's fire test evidence.

5.4 Glass

Glass thickness and type shall be selected in accordance with BS 6262-1, BS 6262-2, BS 6262-3, BS 6262-4 and/or BS 6262-7, as appropriate. If BS 6262-3 is used to select the glass, the wind load shall be calculated in accordance with BS 6375-1.

Insulating glass units shall conform to BS EN 1279 (all parts).

5.5 Hardware except for fixings

Materials for all hardware, except for fixings (see **3.9**), shall have the equivalent corrosion resistance of BS EN 1670:2007, grade (class) 3 (96 h) at a minimum when subjected to a neutral salt spray test. Tests shall be carried out on complete hardware items as supplied.

Hardware shall be replaceable without the need to remove the outer frame from the structure of the building.

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.

5.6 Fixings for hardware

Fixings for hardware shall conform to GGF data sheets 6.7 [N1] and 6.8 [N2].

6 Construction and design

6.1 Manufacturing tolerances

The overall height and width of the doorset shall be ±3 mm of the specified size. The difference between the diagonals of the assembled outer frame shall be not more than 4 mm.

6.2 Door leaves

The door leaves, however designed, shall move freely and smoothly throughout their intended range of movement.

For door leaves that have identical moulding details on both faces, the mouldings shall be aligned both horizontally and vertically between the external and the internal face. When measured, the

reference points of opposing mouldings shall align between the two faces with a difference of not more than 6 mm.

6.3 Door outer frames

The door outer frames shall conform to:

a) BS 7412 for unplasticized polyvinyl chloride (PVC-U);

b) BS 4873 for aluminium; and

c) BS 644 for timber.

NOTE *There are new materials available for which no product standard has yet been published. Such materials may be used provided that the finished doorset meets the thermal cycling requirement specified in Clause **10**, together with any other requirements specific to the doorset's intended use (e.g. fire resistance).*

6.4 Design for glazing

The frame design shall be such that:

a) the door leaf can be glazed in accordance with BS 6262-1, BS 6262-2, BS 6262-3, BS 6262-4 and BS 6262-6 for glass selection;

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

c) it is possible to renew the glazing gasket without removing the outer frame from the structure of the building.

7 Appearance and finish

7.1 General

COMMENTARY ON 7.1

A feature of some composite doorsets is the presence of a simulated woodgrain textured surface. This makes measurement of colour and gloss by absolute methods impossible. Where control of this feature is part of the specification, it can be achieved only by using agreed variation samples and discussion with the customer.

The colour and/or appearance of an assembled door, whether supplied fully finished or for finishing on site, shall be uniform and consistent when viewed by normal or corrected vision at a range of 1 m, facing 45° north-sky light in natural light, viewing perpendicular to the surface in accordance with BS EN ISO 105-A01:2010, Clause **14**.

NOTE *Composite doorsets can be supplied with a variety of finishes, including painted finishes and finishes integral to the facing material. Doorsets can be supplied fully finished, unfinished for site painting, or a combination as agreed between the contracting parties.*

7.2 Doorsets supplied fully finished

For fibre-reinforced thermoset (FRT) surfaces, there shall be no break-out of the fibre more than 6 mm away from a fabricated area or cut edge.

NOTE 1 *The most common form of FRT is glass reinforced plastic (GRP).*

For doors with a gloss finish, the variation in gloss value, when determined in accordance with BS EN ISO 2813, shall not exceed 20 gloss units within a door, or 15 gloss units between a door and its agreed comparison sample or declared gloss value.

NOTE 2 Particular care is required with double doors, and the finish for both leaves should come from the same batch where possible.

7.3 Doors supplied for finishing on site

For FRT surfaces, there shall be no break-out of the fibre more than 6 mm away from a fabricated area or cut edge (unless permanently covered in use by another component such as a letterplate).

8 Glazing

Any glazing shall be in accordance with the recommendations given in BS 8000-7.

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

9 Installation, use, cleaning and maintenance

Guidance on the installation, use, cleaning and maintenance of composite doors shall be provided by the manufacturer.

NOTE Installation should be in accordance with BS 8213-4.

10 Thermal cycling

When tested in accordance with Annex B, the doorset shall meet the assessment criteria in **B.5**.

NOTE 1 Test data indicates that door leaves finished with a dark colour tend to give rise to higher surface temperatures and might cause more thermal expansion.

NOTE 2 The test described in Annex B is intended to assess the resistance of a doorset when subjected to simulated solar heat gain and cooling by simulated precipitation. The substitution of similar locking mechanisms with the same number of locking points in similar locations does not necessarily require further testing in accordance with Annex B.

11 Security

11.1 Basic security

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

11.2 Enhanced security

When enhanced security is required, doorsets shall conform to PAS 24.

12 Safety in case of fire

12.1 Fire resistance

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

12.2 Reaction to fire

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

NOTE The UK national Building Regulations [2–4] identify reaction to fire as a characteristic to be considered for roof windows only.

13 Safety in use

13.1 Impact resistance

Impact resistance shall be declared in accordance with BS 6375-2.

13.2 Safety devices

When fitted, the load-bearing capacity of safety devices shall conform to BS 6375-2:2009, **5.3**.

13.3 Emergency exit and panic devices

The ability to release of emergency exit devices or panic devices shall conform to BS 6375-3:2009+A1:2013, **5.4**.

14 Weathertightness

The completed doorset shall meet the weathertightness requirements for the appropriate classification specified in BS 6375-1.

15 Operation and strength characteristics

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

16 Hygiene, health and environment

*COMMENTARY ON CLAUSE **16***

This clause is relevant to the Construction Products Regulation [1].

The performance of any ventilation device (**3.14**) mounted within the doorset shall be classified in accordance with BS EN 13142 when tested in accordance with BS EN 13141-1.

NOTE There is a requirement in BS EN 14351-1 for the manufacturer to declare any dangerous substances which can be emitted or migrate into the environment during typical intended use.

17 Acoustic performance

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

18 Energy conservation

The thermal transmittance (U-value) of the doorset shall be declared in accordance with BS 6375-3.

19 Marking

Each doorset shall be identified with the following information:

a) the number and date of this British Standard, i.e. BS 8529:2017[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:

1) to 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.

NOTE Attention is drawn to the Construction Products Regulation [1].

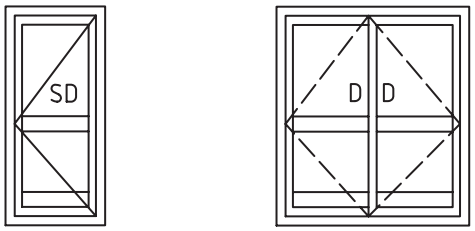
1 Marking BS 8529:2017 on or in relation to a product represents a manufacturer's declaration of conformity, i.e. a claim by or on behalf of the manufacturer that the product meets the requirements of the standard. The accuracy of the claim is solely the claimant's responsibility. Such a declaration is not to be confused with third-party certification of conformity.

Annex A (normative)
Specification for handing

When specifying handing, the door shall be viewed from the outside.

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

Figure A.1 — *Drawing conventions for door types*



a) Single-leaf door, left-hand open out

b) Double-leaf door open in, left-hand first opening leaf

NOTE 1 Doorsets should be viewed from outside.

NOTE 2 Solid lines determine open-out. Perforated lines determine open in.

Annex B (normative)
Thermal cyclic test

B.1 Apparatus

B.1.1 *Spraying system*, as specified in BS EN 1027:2000, **5.6.**

B.1.2 *Matt black copper disc* of the dimensions shown in Figure B.1.

B.1.3 *Bank of lamps*, each capable of producing a black disc temperature of 75 °C within 20 min to 30 min. The lamps shall have a nominal input power of 300 W each and shall be positioned in a grid formation at (300 ±50) mm centres. The nominal size of the grid shall be 1.8 m high by 1.2 m wide (see Figure B.2). The distance between the lamps and the surface of the door shall be not less than 0.8 m and not greater than 2.5 m.

NOTE 1 The distance between the surface of the sample and the lamps may be varied to adjust the rate of temperature rise. The voltage or amperage may also be varied to control the test temperature.

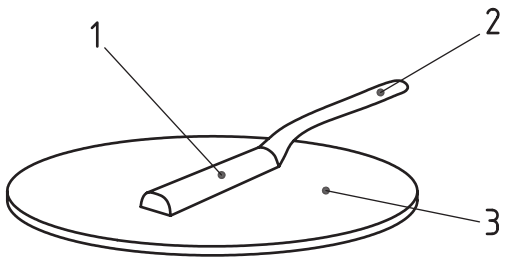
NOTE 2 Philips IR300[2] lamps have been successfully used.

B.1.4 *Means of measuring and recording* the ambient temperature to an accuracy of ±2 °C.

B.1.5 *Thermocouple*, attached to the matt black copper disc (**B.1.2**), capable of measuring the temperature to an accuracy of ±1 °C.

2 Philips IR300 is a trade mark owned by Philips Lighting, Philips Centre, Guildford Business Park, Guildford, Surrey, GU2 8XH, and is an example of a suitable product available commercially. This information is given for the convenience of users of this standard and does not constitute an endorsement by BSI of this product.

Figure B.1 — *Matt black copper disc*



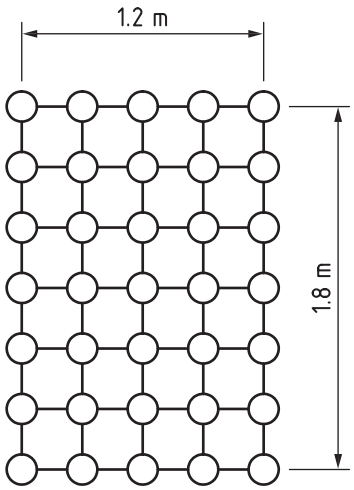
Key

1 Thermocouple

2 Thermocouple wires

3 Matt black copper disc, (20 ±3) mm in diameter and (0.1 ±0.05) mm thick

Figure B.2 — *Lamp grid nominal dimensions*



B.2 Preparation of the test specimen

B.2.1 Install the doorset in accordance with BS EN 1027:2000, **6.1**.

B.2.2 Measure the door leaf thickness at the four corners and record the measurement to the nearest 0.1 mm.

B.3 Preparation of the test apparatus

B.3.1 Set up the spraying system in accordance with BS EN 1027:2000, **6.2**. The temperature of the water shall be between 10 °C and 20 °C.

B.3.2 Position the black disc on the front surface of the door, at a point within 100 mm of the centre lamp normal to the plane of the grid. Adjust the bank of lamps as necessary until the surface of the black disc reaches a temperature of (75 ±3) °C.

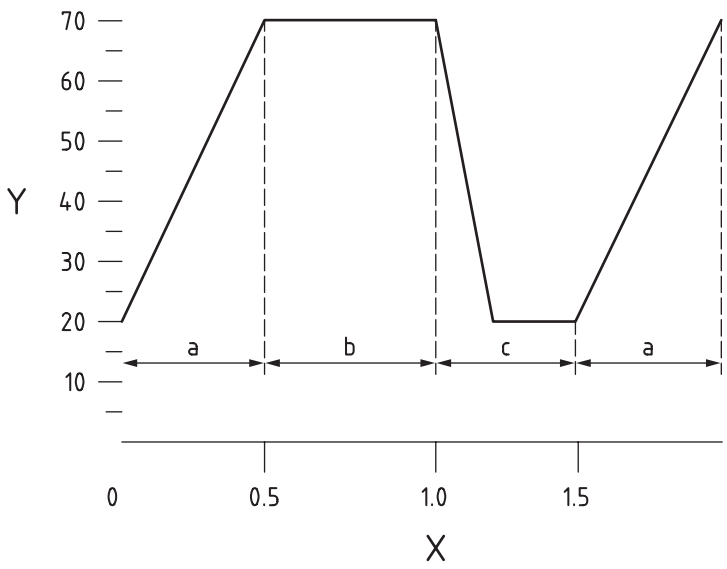
B.3.3 Measure the ambient air temperature at a position (300 ±100) mm behind the doorset and within 100 mm of the geometric centre, and record the measurement. If the tested sample contains a glazed area then the measurement point shall not be subject to direct heating from the lamps. The ambient air temperature shall not rise by more than 10 °C, or above 30 °C.

B.4 Test sequence

B.4.1 Operate the doorset three times. For each of the three operations, measure the operating forces in accordance with BS 6375-2 and record the results.

B.4.2 Subject the external surface of the doorset to 100 heating and cooling cycles. Each cycle shall consist of a 1 h heating period followed by a 30 min water spray period. From the start of each heating period, the measured temperature of the black disc shall reach (75 ±3) °C within 20 min to 30 min. The temperature shall remain at (75 ±3) °C for the remainder of the heating period. Each heating period shall be (60 ±5) min in total. Each water spray period shall be (30 ±5) min. Each cycle shall be (90 ±10) min. The total cyclic test period shall be (150 ±1) h (see Figure B.3).

Figure B.3 — *Thermal cyclic test*



Key

X	Time (h)
Y	Temperature (°C)
a	temperature rise period of 30^{+0}_{-10} min
a + b	total heating period of (60 ±5) min
c	water spray period (30 ±5) min
a + b + c	cycle time (90 ±10) min

B.4.3 Following the completion of the 100 cycles, leave the doorset at standard laboratory conditions for a minimum period of 2 h, after which measure the operating forces again in accordance with BS 6375-2, and the results recorded.

B.5 Assessment criteria

The doorset shall be deemed to have passed the test if:

a) the operating forces meet the requirements of BS 6375-2 both before and after the cyclic test;

b) following the cyclic test, the doorset shows no signs of cracking, delaminating or blistering; and

c) the door leaf thickness at the four corners remains within 5% of the measurement recorded in **B.2.2**.

The results shall be recorded in a test report. All observations of the general condition of the doorset shall be included in the test report.

Bibliography

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 and doors — Part 4: Code of practice for the survey and installation of windows and external doorsets*

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

BS EN 14351-1, *Windows and doors — Product standard, performance characteristics — Part 1: Windows and external pedestrian doorsets*

BS EN 16034, *Pedestrian doorsets, industrial, commercial, garage doors and openable windows — Product standard, performance characteristics — Fire resisting and/or smoke control characteristics*

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] GREAT BRITAIN. Building Regulations 2010 (SI No. 2214 2000) and subsequent amendments. London: The Stationery Office.

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[4] GREAT BRITAIN. Building Regulations (Northern Ireland) 2012 (SI No. 2012 192). Belfast: The Stationery Office.

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