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**Agrément
Certificate
No 08/4533**
Second issue *

Designated by Government
to issue
European Technical
Approvals

DURAFLEX PVC-U DOOR SYSTEM

Porte
Tür

Product



- THIS CERTIFICATE RELATES TO THE DURAFLEX PVC-U DOOR SYSTEM COMPRISING THE DOOR AND DOORSET TYPES AND SIZES REFERRED TO IN THE ACCOMPANYING DETAIL SHEETS.
- The doors and doorsets referred to in the Detail Sheets are fabricated and marketed by Norvik PVCu Window Systems Ltd at the above address.
- The doors and doorsets in the Duraflex range are for use in the exposure situations described in the relevant Detail Sheets.
- It is essential that the doors and doorsets are installed and used in accordance with the conditions set out in the Design Data and Installation parts of the Detail Sheets.

Building Regulations

1 The Building Regulations (England and Wales)



The Secretary of State has agreed with the British Board of Agrément the requirements of the Building Regulations to which doors and doorsets can contribute in achieving compliance. In the opinion of the BBA, the position of the Duraflex PVC-U Door System under the Regulations, if used in accordance with the provisions of this Certificate, is as stated in Detail Sheet 1.

2 The Building (Scotland) Regulations



In the opinion of the BBA, the position of the Duraflex PVC-U Door System under these Regulations, if used in accordance with the provisions of this Certificate, is as stated in Detail Sheet 1.

3 The Building Regulations (Northern Ireland)



In the opinion of the BBA, the position of the Duraflex PVC-U Door System under these Regulations, if used in accordance with the provisions of this Certificate, is as stated in Detail Sheet 1.

4 Construction (Design and Management) Regulations

In the opinion of the BBA, the position of the Duraflex PVC-U Door System under these Regulations, if used in accordance with the provisions of this Certificate, is as stated in Detail Sheet 1.

Conditions of Certification

5 Conditions

5.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

5.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

5.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine

- are reviewed by the BBA as and when it considers appropriate.

5.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product/system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

5.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.



In the opinion of the British Board of Agrément, Duraflex PVC-U Door System is fit for its intended use provided they are installed, used and maintained as set out in this Certificate. Certificate No 08/4533 is accordingly awarded to Norvik PVCu Window Systems Ltd.

On behalf of the British Board of Agrément

Date of Second issue: 14th May 2009

Chris Hunt
Head of Approvals — Physics

Greg Cooper
Chief Executive

* Original Certificate issued on 14th March 2008. This amended version includes a revised list of Associated Detail Sheets.

Associated Detail Sheets

The following Detail Sheets are part of this Certificate:

Detail Sheet	Edition	Date of issue	No of pages	Imprint ref	Title	Status
ER2	—	14th May 2009	4	4533ER2	Enhanced resistance to intrusion ⁽¹⁾	Current
1	7	10th March 2008	4	07BRD1	PVC-U Door System Building Regulations	Current
2	2	4th December 2007	8	02DFD2	Duraflex Diamond Suite PVC-U Residential Doorsets	Current

(1) This *Enhanced resistance to intrusion* sheet 4533ER2 is only applicable to the types and specifications of door defined in section 2 *Scope of approval* in the sheet.

Product



CAUTION: This sheet is not valid in isolation and must be read in conjunction with Detail Sheet 2. The information in this sheet supplements the details given in Detail Sheet 2, section 10, *Security against intrusion*.

- The details in this sheet are only relevant to doors fabricated by Norvik PVCu Window Systems Ltd and meeting the specification defined in section 2, Scope of approval.
- It is essential that the doors are installed in accordance with the recommendations contained in Detail Sheet 2, and in the manufacturer's instructions to achieve the standard of enhanced resistance defined in this sheet.

Enhanced Resistance to Intrusion

1 General

Selected doors from the inward opening and outward opening Duraflex Diamond Suite PVC-U Residential Doorsets range covered by Detail Sheet 2 were tested in accordance with PAS 24-1 : 1999 *Enhanced security performance requirements for door assemblies — Part 1 : Single leaf external door assemblies to dwellings*, and met the requirements. The tests included: soft body impacts, hard body impacts, simultaneous in-plane/lateral loading (3 kN in-plane and 4.5 kN lateral loads), manipulation, mechanical tests on glazing, hard body impact on the lock handle and cylinder attack.

2 Scope of approval

2.1 The specification for the doors considered to offer enhanced resistance to intrusion comprises inward and outward opening, single residential, internally glazed doorsets coupled with or without a sidelight. The doorsets are fitted with glass/mid-rail/glass and are of maximum size 1500 mm wide by 2150 mm high, fabricated from the components listed in Table 1.

2.2 The scope of the test programme does not cover glass breakage as a means of entry. In locations where this is considered to be a significant risk the use of laminated glass or other suitable glazing material may be necessary.

3 Design features

All main frame, door leaf and mid-rail profiles must be reinforced with aluminium or steel in accordance with the recommendations contained

in the *Duraflex 65 mm/70 mm R.I.G. Fabrication Guides*. Fittings and hardware must also be fixed in accordance with these guides.

4 Design considerations

4.1 Only the specification of doors referred to in section 2.1 can be considered to meet the requirements. Any design variations to the frame profiles, internal reinforcement, locking mechanisms, cylinders, handles, keeps, hinge bolts, hinges or associated fasteners, will require the doors to be retested.

4.2 To ensure the level of resistance to intrusion indicated by the tests is achieved, installation must be carried out in accordance with the recommendations contained in Detail Sheet 2, and the manufacturer's instructions. For example, correct glass packing and fixing of the door into the opening are critical.

4.3 Doors assessed for enhanced resistance to intrusion are designed to resist attempts to forced entry by the opportunist intruder using basic hand tools. However, the scope of assessment does not extend to an assurance of absolute security. In addition, door security must be considered in the context of the overall security of the building, taking into account such factors as vulnerability of individual doors and the security of windows. Reference should be made to recommendations given by ABI⁽¹⁾, BRE⁽¹⁾, CWCT⁽¹⁾, GGF⁽¹⁾, NHBC⁽¹⁾, ZM⁽¹⁾, and local police Secured by design schemes.

- | | |
|---------|---|
| (1) ABI | Association of British Insurers |
| BRE | Building Research Establishment |
| CWCT | Centre for Window and Cladding Technology |
| GGF | Glass and Glazing Federation |
| NHBC | National House-Building Council |
| ZM | Zurich Municipal |

Table 1 List of components, first set⁽¹⁾

	Description	Section or quantity	Manufacturer's designation ⁽²⁾
Profiles	65 mm outer frame	L	6002/6502
	reinforcement (steel)	—	3883S
	door leaf (outward opening)	T	6065/6565
	door leaf (inward opening)	Z	6066/6566
	reinforcement (steel)	—	3574S
	reinforcement (steel)	—	3844S
	mid-rail	T	6036/6536
	reinforcement (aluminium)	—	3572S
	coupling cover	—	3038
	coupling	—	3082 aluminium (10 mm)
Glazing retention	28 mm internal co-extruded glazing bead	—	5850
	glazing gasket for internal beading	—	Q-LON rolled in
	glazing clips	—	GT products Securi-clip
Furniture and fittings	door lock	— Paddock Lockmaster incorporating 2 hook bolts, 2 deadbolts and 2 roller cams	— ✓
	lock keeps	— Paddock Lockmaster	3 ✓
	cylinder	— Avocet 6-pin anti-drill security cylinder	— ✓
	handle	— Paddock Lever/Lever	— ✓
	hinges	— Avocet Triad HP3D	3 ✓
	dog bolt	— Mila	2 ✓
	run up blocks	— Duraflex	— ✓

(1) Items from each set cannot be interchanged.

(2) These items may be unmarked and it is recommended that if in doubt the purchaser seeks written assurance of the component specifications from the Certificate holder.

Table 2 List of components, second set⁽¹⁾

	Description	Section or quantity	Manufacturer's designation ⁽²⁾
Profiles	70 mm outer frame	L	7001/7501
	reinforcement (steel)	—	3882S
	door leaf (outward opening)	T	6065/6565
	door leaf (inward opening)	Z	6066/6566
	reinforcement (steel)	—	3574S
	reinforcement (steel)	—	3829S
	transom/mullion	T	7036/7536
	transom/mullion	Z	7037/7537
	reinforcement (steel)	—	3718S
Glazing retention	28 mm internal co-extruded glazing bead	—	5850/5851/5852
	glazing clips	—	SC104
Furniture and fittings	door lock	— Saracen Series 6000 multipoint incorporating 2 hook bolts, 2 roller cams, deadbolt and centre latch	— ✓
	lock keeps	— Saracen Series 6000	3 ✓
	cylinder	— Laird Anti-pick or nickel 40/50	— ✓
	cylinder guard	— Laird	— DCLSCO0005A
	handle	— Hoppe Lever/Lever	— DHMW
	hinges	— Laird Nexus 3D	3 ✓
	dog bolt	— Mila	2 ✓
	run up blocks	— Duraflex	— WARBB

(1) Items from each set cannot be interchanged.

(2) These items may be unmarked and it is recommended that if in doubt the purchaser seeks written assurance of the component specifications from the Certificate holder.

Table 3 List of components, third set⁽¹⁾

	Description	Section or quantity	Manufacturer's designation ⁽²⁾	
Profiles	70 mm outer frame reinforcement (steel)	L	7002/7502	
	door leaf (inward/outward opening) reinforcement (steel)	—	3882S	
	reinforcement (steel)	T	6065/6565	
	reinforcement (steel)	—	3880S (head, sill and hinge)	
	reinforcement (steel)	—	3993S1750	
Glazing retention	mid-rail reinforcement (steel)	T	(lock style pre-punched) 6036/6536	
	28 mm internal co-extruded glazing bead	—	3572S	
	glazing clips	8	5850 GT Products Securiclip	
Furniture and fittings	door lock	— Paddock Lockmaster incorporating 2 hook bolts, 3 deadlocks and 2 roller cams	—	
		— Paddock Lockmaster incorporating 2 hook bolts, 1 deadlock and 4 roller cams	—	
	lock keeps	— Paddock Lockmaster	—	
	cylinder	— nickel 40/50	—	
	handle	— Paddock Lever/Lever key lockable	—	
	hinges	— Paddock PH4100 Elevator	3	
	dog bolt	— Paddock PHD 01/19	2	
	run up blocks	— Duraflex	4	
				✓
				✓


(1) Items from each set cannot be interchanged.

(2) These items may be unmarked and it is recommended that if in doubt the purchaser seeks written assurance of the component specifications from the Certificate holder.



On behalf of the British Board of Agrément

Date of Second issue: 14th May 2009


Chris Hunt
Head of Approvals — Physics


Greg Cooper
Chief Executive

Regulations

1 The Building Regulations 2000 (as amended) (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the requirements of the Building Regulations to which doors can contribute in achieving compliance. In the opinion of the BBA, the PVC-U Door System specified on the Front Sheet, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: **B1**

Means of warning and escape

Comment:

When a PVC-U door is fitted in an escape route, in relation to locking mechanisms to clauses 6.11 and 6.12 of Approved Document B, reference should be made to the relevant tinted area (6.1 and 6.2) in the *Accessible threshold and unobstructed opening area* section of the accompanying Detail Sheet(s).

Requirement: **L1(a)(i)**

Conservation of fuel and power

Comment:

In calculating the heat loss through doors, the U values given in the tinted areas in the *Thermal transmittance* section of the accompanying Detail Sheet(s) should be used. For glazing other than that described in the accompanying Detail Sheet(s), the indicative U values shown in Table 6e of SAP 2005, *The Government's Standard Assessment Procedure for Energy Rating of Dwellings* can be used. When available, a certified U value by measurement or calculation, in accordance with the relevant Standards, should be used. In new work, the guidance given in the Approved Document to Part L regarding positioning a door in the reveal must be taken into account. In replacement work or new doors in extensions, an average elemental U value of $2.2 \text{ Wm}^{-2}\text{K}^{-1}$ is required for doors with more than 50% glass area. This can be met by the use of 4/16/4 mm double-glazed units with a low-E coating of emissivity 0.15 or better.

Requirement: **M1(a)**

Access and use

Comment:

Doors providing a minimum clear opening width of 775 mm in to a dwelling will meet the requirements of clause 6.23 thus providing access for disabled people through an external door. See the relevant area (6.4) in the *Accessible threshold and unobstructed opening area* of the accompanying Detail Sheet(s).

Requirement: **M1(b)**

Access and use

Comment:

Doors will satisfy the requirement of clause 2.17(a) when the opening force at the leading edge of the door is no greater than 20 N.

Requirement: **M2**

Access to extensions to buildings other than dwellings

Comment:

Doors with accessible (low) thresholds will meet the requirements of M2. Doors not including an accessible threshold cannot be used in new work where this Requirement applies. See the relevant tinted area (6.3) in the *Accessible threshold and unobstructed opening area* section of the accompanying Detail Sheet(s).

Requirement: N1	Protection against impact
Requirement: N2	Manifestation of glazing
Comment:	Glazing less than 1500 mm above floor or ground level in doors and side panels should meet the requirements of N1. Except where only small panes are fitted, glass and plastics sheet materials which satisfy the test requirements of BS 6206 : 1981 should be used to meet the requirements of N1. See the tinted area in the <i>Safety</i> section of the accompanying Detail Sheet(s). To meet the requirements of N2, it may be necessary to incorporate features into glazing in non-domestic buildings to make its existence apparent to people using the doors.
Requirement: Regulation 7	Materials and workmanship
Comment:	The system is acceptable. See the tinted areas in the <i>Durability</i> section and the <i>Installation</i> part of the accompanying Detail Sheet(s).

In addition to the contribution which the product can make to meeting the relevant requirements, the following should be noted:

Requirement: B3(2) and (3)	Internal fire spread (structure)
	The doors do not have an established fire resistance rating and should not be used where fire resistance requirements apply.

2 The Building (Scotland) Regulations 2004 (as amended)



In the opinion of the BBA, the PVC-U Door System specified on the Front Sheet, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards as listed below.

Regulation: 8(1)(2)	Fitness and durability of materials and workmanship
Comment:	The system satisfies the requirements of this Regulation. See the tinted areas in the <i>Maintenance</i> and <i>Durability</i> section and the <i>Installation</i> part of the accompanying Detail Sheet(s).
Regulation: 9	Building standards – construction
Standard: 2.9	Escape
Comment:	When a PVC-U door is fitted in an escape route with reference to clauses 2.9.8 ⁽¹⁾⁽²⁾ and 2.9.9 ⁽²⁾ , the unobstructed height and width can be calculated using the profile dimensions indicated in the relevant tinted area (6.2) in the <i>Accessible threshold and unobstructed opening area</i> section of the accompanying Detail Sheet(s). When a PVC-U door is fitted in an escape route, in relation to locking mechanisms with reference to clauses 2.9.14 ⁽¹⁾ and 2.9.15 ⁽²⁾ , reference should be made to the relevant tinted area (6.1) in the <i>Accessible threshold and unobstructed opening area</i> section of the accompanying Detail Sheet(s).
Standard: 3.10	Precipitation
Comment:	Walls incorporating the section, installed and used in accordance with the provisions of the accompanying Detail Sheet(s), can meet this Standard, with reference to clause 3.10.1 ⁽¹⁾⁽²⁾ . See Table 3 of the accompanying Detail Sheet(s).
Standard: 3.15	Condensation
Comment:	The system can contribute to satisfying this Standard, with reference to clause 3.15.3 ⁽¹⁾ . See the tinted areas in the <i>Thermal transmittance</i> section of the accompanying Detail Sheet(s).
Standard: 4.1	Access within buildings
Comment:	The principle entrance door of a building containing flats and maisonettes or other building not being a single house, with reference to clauses 4.1.8 ⁽¹⁾ and 4.1.9 ⁽²⁾ , must contain a leaf which provides a clear opening width of at least 800 mm. The principle entrance door of a house, with reference to clause 4.1.9 ⁽¹⁾ , must contain a leaf which provides a clear opening width of at least 775 mm. See the relevant tinted area (6.4) in the <i>Accessible threshold and unobstructed opening area</i> section of the accompanying Detail Sheet(s). Doors with accessible (low) thresholds will meet the requirements of clause 4.1.9 ⁽¹⁾⁽²⁾ . Doors not including any accessible threshold cannot be used in new work where this requirement applies. See the relevant tinted area (6.3) in the <i>Accessible threshold and unobstructed opening area</i> section of the accompanying Detail Sheet(s).

Standard:	4.8(a)(b)	Danger from accidents
Comment:		Glazing must comply with the details in BS 6262-1 : 2005 where accidental collision with it is likely, with reference to clause 4.8.2 ⁽¹⁾⁽²⁾ . See the tinted area in the <i>Safety</i> section of the accompanying Detail Sheet(s).
Standard:	6.1(a)(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		In satisfying these Standards, with reference to clauses 6.1.3 ⁽¹⁾⁽²⁾ , 6.2.1 ⁽¹⁾⁽²⁾ , 6.2.2 ⁽¹⁾⁽²⁾ , 6.2.3 ⁽¹⁾⁽²⁾ , 6.2.7 ⁽¹⁾ , 6.2.8 ⁽²⁾ , 6.2.9 ⁽¹⁾ and 6.2.10 ⁽²⁾ , the U values given in the tinted area of the <i>Thermal insulation</i> section of the accompanying Detail Sheet(s) should be used. For glazing other than that described in the Detail Sheet(s) indicative U values shown in Table 6e of SAP 2005, <i>The Government's Standard Assessment Procedure for Energy Rating of Dwellings</i> can be used. However, when available, a certified U value should be used in preference to the tabulated data. (1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).

3 The Building Regulations (Northern Ireland) 2000 (as amended)



In the opinion of the BBA, the PVC-U Door System specified on the Front Sheets, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The system is acceptable. See the tinted areas in the <i>Durability</i> section and the <i>Installation</i> part of the accompanying Detail Sheet(s).
Regulation:	B3(2)	Suitability of certain materials
Comment:		The system is acceptable. See the tinted areas in the <i>Maintenance</i> section of the accompanying Detail Sheet(s).
Regulation:	C4	Resistance to ground moisture and weather
Comment:		The doors are weathertight when installed and used in accordance with the provisions of this Certificate and can thus contribute to the ability of the wall to meet this Regulation.
Regulation:	E2	Means of escape
Comment:		When the PVC-U door is fitted in an escape route, the actual width between door jambs can be determined using the profile dimensions indicated in the relevant tinted area (6.2) of the <i>Accessible threshold and Unobstructed opening area</i> section of the accompanying Detail Sheet(s). These doors do not have an established fire resistance rating and are therefore not for use in any of the situations given in Table 3.5 <i>Fire doors</i> in DoE(NI) Technical Booklet E, <i>Fire Safety</i> , June 1994 (as amended).
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3	Target carbon dioxide Emissions Rate
Comment:		In calculating the heat loss through doors, the U values given in the tinted areas in the <i>Thermal transmittance</i> section of the accompanying Detail Sheet(s) should be used. For glazing other than that described in the accompanying Detail Sheet(s), the indicative U values shown in Table 6e of SAP 2005, <i>The Government's Standard Assessment Procedure for Energy Rating of Dwellings</i> can be used. When available, a certified U value by measurement or calculation, in accordance with the relevant Standards, should be used. In new work, the guidance given in the Approved Document to Part L regarding positioning a door in the reveal must be taken into account. In replacement work or new doors in extensions, an average elemental U value of 2.2 Wm ⁻² K ⁻¹ is required for doors with more than 50% glass area. This can be met by the use of 4/16/4 mm double-glazed units with a low-E coating of emissivity 0.15 or better.
Regulation:	R2	Access and use
Comment:		In a dwelling, the principle entrance door shall have a minimum clear opening width of not less than 775 mm. The profile dimensions indicated in Table 4 of the accompanying Detail Sheet(s) can be used to determine the door opening width. See the relevant tinted areas (6.2 and 6.4) in the

Accessible threshold and unobstructed opening area in the accompanying Detail Sheet(s). Doors not including a level threshold, as defined in Technical Booklet R, Section 7, December 2000 cannot be used in new work where these Regulations apply. See the relevant tinted area (6.3) in the *Accessible threshold and unobstructed opening area* section of the accompanying Detail Sheet(s). Doors will satisfy the requirement of clause 3.10 when the opening force at the leading edge of the door is no greater than 30 N and when open past 30° no greater than 22.5 N.

Regulation: V2

Impact with glazing

Comment:

Where people are likely to come into contact with glazing in a building, the requirements of these Regulations shall be deemed to be satisfied if the glazing complies with Technical Booklet V, Section 2, December 2000. See the tinted area in the *Safety* section of the accompanying Detail Sheet(s).

Regulation: V3

Transparent glazing

Comment:

In a building, other than in a dwelling, transparent glazing, of which people may be unaware and with which they are likely to collide, shall incorporate features which make it apparent. The requirements of these Regulations shall be deemed to be satisfied if the glazing complies with Technical Booklet V, Section 3, December 2000.

4 Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 2 *Delivery and site handling* (2.1) of the accompanying Detail Sheet(s).

Bibliography

BS 6206 : 1981 *Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings*

BS 6262-1 : 2005 *Glazing for buildings — General methodology for the selection of glazing*



On behalf of the British Board of Agrément

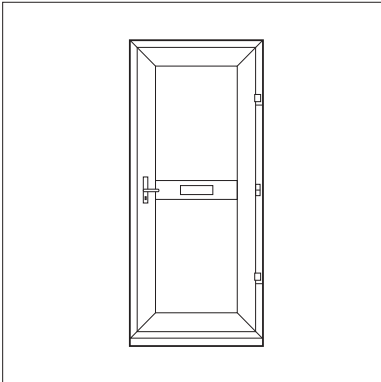
Head of Approvals
— Physics

Chief Executive

Date of Seventh edition: 10th March 2008

DURAFLEX DIAMOND SUITE PVC-U RESIDENTIAL DOORSETS

Product



CAUTION: This Detail Sheet is not valid in isolation and must be read in conjunction with the Front Sheet and Detail Sheet 1 which give the Certificate holder's name and *Conditions of Certification*, and the product's position regarding the Building Regulations respectively.

• THIS DETAIL SHEET RELATES TO THE DURAFLEX DIAMOND SUITE RESIDENTIAL DOORSETS.

• The system comprises single outward or inward opening doorsets, with or without coupled sidelight, all framed in white or woodgrain PVC-U and glazed internally with sealed double-glazed units⁽¹⁾ only.

• The doorsets are for external use as primary or secondary access doors in dwellings or similar applications where the test pressure classes for doors defined in PAS 23-1 : 1999 and indicated in Table 3 are applicable.

• It is essential that the doorsets are installed and maintained in accordance with the conditions set out in the Design Data and Installation parts of this Detail Sheet.

(1) Outside the scope of this Certificate.

Technical Specification

1 Description

1.1 The Diamond Suite PVC-U Residential doorsets (see Figure 1) are fabricated from white and woodgrain finish unplasticised polyvinyl chloride (PVC-U) profiles, produced by conventional extrusion techniques, from material complying with Case B (PVC-U with additional polymers), as defined in MOAT No 17 : 1990. Woodgrain profiles are surface covered with PVC which incorporates a clear acrylic protective lacquer. Profiles are available with the foil applied to both visible faces of a brown PVC-U substrate or to the exterior face only of a white PVC-U substrate. The profiles covered by this Certificate also include those that incorporate ready-applied Q-LON gaskets, eliminating the need for separate assembly of weatherseals and glazing gaskets, as listed in Table 1 and shown in Figure 2.

1.2 The methods of selection, machining and assembly of frame components are detailed in the *Duraflex 65 mm/70 mm R.I.G. Fabrication Guides*.

1.3 Doorsets with sidelight frames incorporate mid-rails connected to the outer frame by means of welded joints. Sidelights are coupled to the door leaf section mechanically.

Figure 1 Corner detail

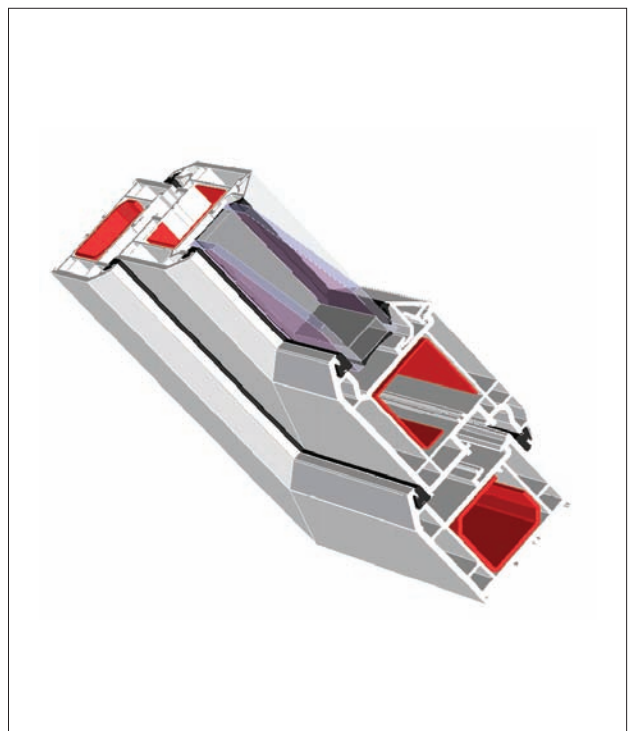


Table 1 Profiles

Manufacturer's designation	Profile type	Application
6002/6502	L-section	65 mm outer frame
7001/7501	L-section	70 mm outer frame
7002/7502	L-section	70 mm outer frame
6065/6565	T-section	door leaf (inward opening)
6066/6566	Z-section	door leaf (outward opening)
6036/6536	T-section	116 mm mid-rail
7036/7536	T-section	transom/mullion
7037/7537	Z-section	transom/mullion
3680	—	stub sill (85 mm)
3640	—	sill (150 mm)
2182	—	sill (180 mm)
3038	—	coupling cover
5850	—	co-extruded glazing bead (28 mm featured)
5851	—	co-extruded glazing bead (28 mm chamfered)
5852	—	co-extruded glazing bead (28 mm scotia)
3880S	—	galvanized steel reinforcement for 6065/6565
3883S	—	galvanized steel reinforcement for 6002
3993S1750	—	galvanized steel reinforcement (lock style pre-punched) for 6065/6565
3574S	—	galvanized steel reinforcement for 6065 and 6066 (head, sill and hinge)
3572S	—	galvanized steel reinforcement for 6063
3882S	—	galvanized steel reinforcement for 7001
3829S	—	galvanized steel reinforcement for 6065 and 6066 (lock jamb)
3718S	—	galvanized steel reinforcement for 7036 and 7037
3082	—	aluminium coupling for 3038 (65 mm)
3549	—	aluminium coupling for 3038 (70 mm)
3767	—	weather bar

1.4 The PVC-U extrusions are cut to length and all holes routed or drilled. Where required, galvanized steel or aluminium⁽¹⁾ reinforcement sections are inserted in the PVC-U sections before they are welded together. The welded connections are then cleaned up using a purpose-made machine which also forms a groove or raised pyramid at the weld. The door is completed by securing the furniture in position with screws.

(1) Aluminium reinforcing sections are available from Duraflex Ltd, but these have not been assessed by the BBA.

1.5 Drainage is provided by a series of slots, 25 mm by 5 mm, positioned in accordance with the *Duraflex 65 mm/70 mm R.I.G. Fabrication Guides*. Door frames incorporating sidelight frames are drained as separate units and drainage slots are cut accordingly. Pressure equalisation is achieved by 5 mm diameter holes, as defined in the *Duraflex 65 mm/70 mm R.I.G. Fabrication Guides*. Inward opening doors are fitted with a weather bar at threshold level. Woodgrain finished sills are vented, as described in the *Duraflex 65 mm/70 mm R.I.G. Fabrication Guides*, to prevent pressure changes causing distortion.

Reinforcement

1.6 For white doorsets the outer frame is reinforced with galvanized steel in all jamb and sill members adjacent to the door leaf.

1.7 All members of door leaves are fully reinforced with galvanized steel. Mid-rails are reinforced with galvanized steel when their length exceeds 1000 mm.

1.8 All woodgrain finished members of the door are fully reinforced with galvanized steel on all occasions.

1.9 Galvanized steel reinforcement is roll-formed from material with a G Z 275N coating complying with BS EN 10327 : 2004. Aluminium reinforcement is extruded from alloy type 6063-T6 to BS 1474 : 1987⁽¹⁾.

(1) Mechanical properties of this alloy type are defined in BS EN 755-2 : 1997.

Size range

1.10 This Detail Sheet covers Diamond Suite residential doorsets with or without sidelight frames within the limitations shown in Table 2.

Table 2 Size restriction

	Dimension (mm)	
	Width	Height
<i>Single-leaf glazed doorsets with or without a mid-rail</i>		
Maximum overall size (65 mm system)	950	2100
(70 mm system)	950	2100
<i>Doorsets with a sidelight both with or without a mid-rail</i>		
Maximum overall size	1560	2100

Furniture and fittings

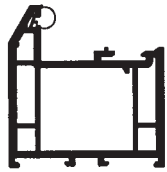
1.11 All doors covered by this Detail Sheet are hung on three hinges, each fixed to the frame with screws penetrating either two thicknesses of PVC-U and/or reinforcement. In doorsets incorporating a sidelight, the door leaf is hung on a jamb attached to the masonry surround. A different hinge arrangement or the use of dog bolts may be necessary for doors requiring a high level of security.

1.12 Doors are fastened by multi-bolt locks operated by a handle available as a lever type on both sides. Handles are available in various finishes. The lock is supplied with adjustable keeps and is fitted with a security cylinder mechanism designed to resist picking.

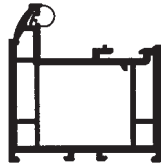
1.13 The doorsets can be supplied with a letter plate in the mid-rail of the door leaf or the sidelight frame. However, the weathertightness of such doors has not been assessed.

1.14 Details of currently approved hinges, locks and other fittings can be obtained from the BBA.

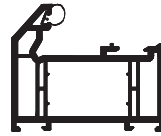
Figure 2 Main profiles



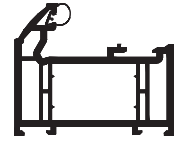
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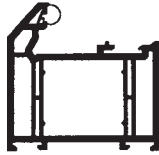
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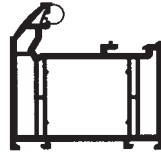
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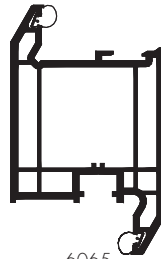
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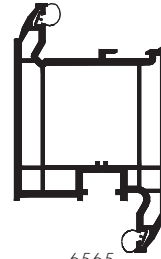
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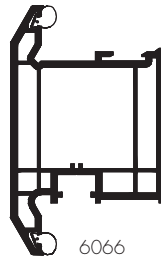
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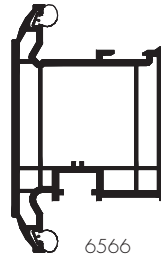
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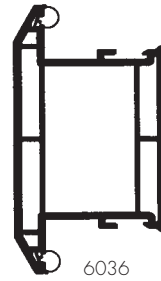
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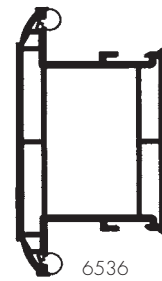
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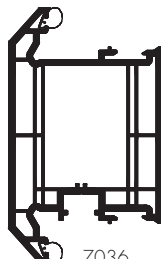
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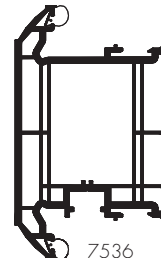
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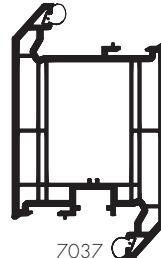
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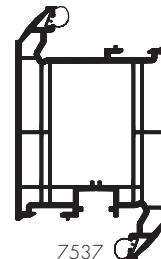
7036



7536



7037



7537



3680



3640



2182



3038



5850



5851



5852



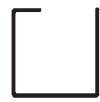
3880S



3883S



3993S1750



3574S



3572S



3882S



3829S



3718S



3082



3549



3767

Glazing

1.15 Doors and sidelight frames are available with half or full-height glazed panels. The doors are supplied either glazed or ready for glazing on site using sealed double-glazed units with thicknesses in accordance with BS 6262-1 : 2005 or, if required by the Building Regulations, with toughened or laminated glass in accordance with BS 6206 : 1981. All glass used is safety glass (see section 8), and is positioned by plastic setting blocks and packing pieces. Q-LON gaskets and weatherstripping can be provided ready-applied onto profiles. The double-glazed unit is secured by co-extruded bead. Insulated infill panels for doors or sidelights have not been assessed.

Weatherstripping and gaskets

1.16 Weatherstripping, in the form of Q-LON, a polyethylene exterior sheath containing a polyurethane high-resilient foam centre core. It is located in grooves around the periphery of the door leaf and the fixed frame.

1.17 Internally-beaded doors and sidelights, are fitted with Q-LON gaskets between the frame and the double-glazed unit. The unit is secured by co-extruded glazing beads with flexible TPE forcing the glass against the externally fitted Q-LON gasket. Externally beaded doors and sidelights have not been assessed.

Quality control

1.18 Quality control includes checks on:

Extruded profiles

- dimensions
- colour
- heat reversion
- resistance to cold impact

Fabrication procedures

- extrusions and fittings (visual inspection)
- overall dimensions
- operation and opening of locking mechanisms
- strength of welded corners.

2 Delivery and site handling

2.1 The doorsets are delivered to site either glazed or ready for glazing on site. For transportation they are protected as necessary to avoid damage. External surfaces of the PVC-U profiles are additionally protected with adhesive tape. Particular care is needed to avoid damaging woodgrain finishes, as it may be difficult to restore the appearance.

2.2 Each doorset has a label bearing the marketing company's mark and the BBA identification mark incorporating the number of this Certificate.

2.3 The doorsets should be stored under cover in a clean area, vertically on edge and suitably supported to avoid distortion or damage.

Design Data

3 General



3.1 Selected samples from the Duraflex Diamond Suite PVC-U Residential Doorsets covered by this Detail Sheet were tested in accordance with PAS 23-1 : 1999. Assessment of the test results show that the products, within the range described in section 1.10 of this Detail Sheet, are suitable for use where the test pressure classes defined in PAS 23-1 : 1999 and indicated in Table 3 are applicable. The gradings are based on the assumption that the outer frame is supported on all four sides in accordance with the manufacturer's instructions.

Table 3 Test pressure class

	PAS 23-1 Test pressure class (Pa)
<i>Strength and stability</i>	
Single leaf inward opening doorsets (standard threshold) maximum size 950 mm (L) x 2100 mm (H)	1600
Single leaf inward opening doorsets (aluminium low threshold) maximum size 950 mm (L) x 2150 mm (H)	800
Doorsets incorporating a sidelight	
single-leaf outward opening doorsets	1200
single-leaf inward opening doorsets	1600
<i>Watertightness⁽¹⁾</i>	
Inward opening doorset (standard threshold) maximum size 950 mm (L) x 2100 mm (H)	200
Inward opening doorsets (aluminium low threshold) maximum size 950 mm (L) x 2150 mm (H)	100
Outward opening doorset	200
<i>Air permeability⁽¹⁾</i>	
Single leaf inward opening doorsets (standard threshold) maximum size 950 mm (L) x 2100 mm (H)	300
Single leaf inward opening doorsets (aluminium low threshold) maximum size 950 mm (L) x 2150 mm (H)	300
Single leaf outward opening doorsets	600
Doorsets incorporating a sidelight	
single-leaf outward opening doorsets	600
single-leaf inward opening doorsets	200
<i>Exposure category rating</i>	
Single leaf inward opening doorsets (standard threshold)	1600
Single leaf inward opening doorsets (aluminium low threshold)	800
Doorsets incorporating a sidelight	
single-leaf outward opening doorsets	1200 special
single-leaf inward opening doorsets	800X

(1) The watertightness performance, especially with regards to air and water, can be affected if the keeps are not correctly adjusted.

3.2 For unusual building layouts, building shapes or ground topography, the designer will need to give particular consideration to the prevailing exposure conditions.

4 Practicability of installation

4.1 Installation does not present undue difficulty when fitting the doorsets in openings in new or existing walls provided the installation instructions are followed.

4.2 In common with other types of doorsets fitted to prepared openings, Diamond Suite doorsets must be correctly positioned in relation to vertical damp-proof courses to prevent water penetration to the internal reveal.

4.3 Care is required, particularly when fitting doorsets incorporating sidelight frames, to ensure that the frame is positioned vertically and free from twist.

5 Glass area

If a glazed door is to be considered as part of the door area the approximate unobstructed area can be determined by deducting from the overall height and width the appropriate profile dimensions. Typical profile dimensions are given in Table 4.

Table 4 Typical dimensions for determining unobstructed glass area

Feature	Deduction from overall height and width (mm)
Outer frame in sidelight	68
Outer frame and door leaf	146
Mid-rail	116
Door threshold and bottom rail	146

6 Accessible threshold and unobstructed opening area



6.1 When a residential doorset is fitted in an escape route, it should be fitted only with a lock or fastening which is readily operated, without a key, from the side approached by people making an escape, such devices have not been included in this assessment.



6.2 When a residential doorset is fitted in an escape route, the unobstructed width and height can be calculated by deducting 140 mm or 120 mm from the overall door width and height.

6.3 The single-leaf inward and outward opening residential doorsets can be fitted with a 15 mm high aluminium threshold designed to meet the requirements of the relevant building regulations when suitably installed (see Figure 3).

6.4 When an external residential door has a minimum clear opening width of 775 mm, this will provide access for all persons, including disabled people.

7 Thermal transmittance and condensation risk

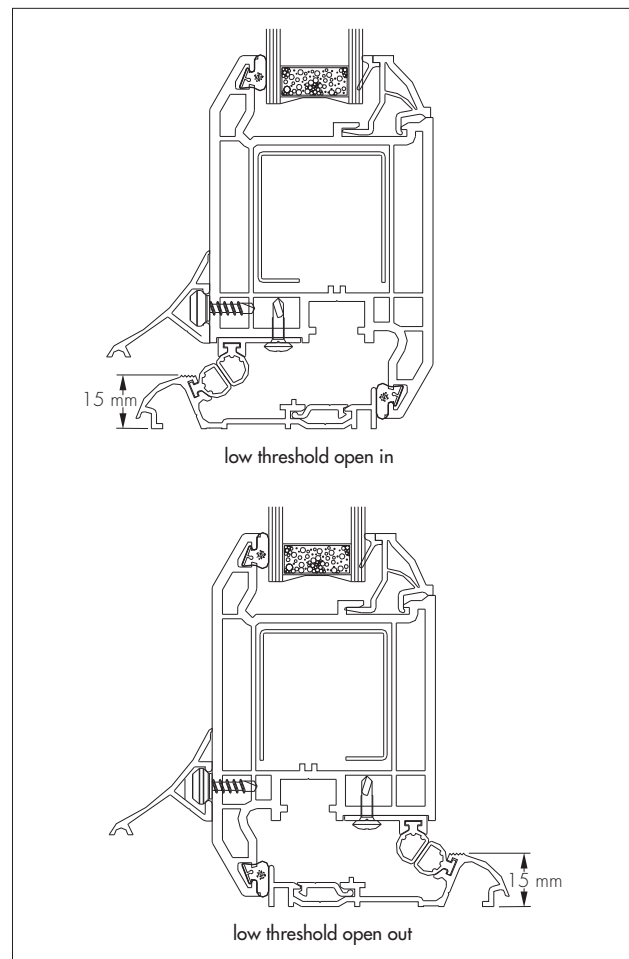


7.1 The thermal transmittance value (U value) of a Diamond Suite residential door, 2100 mm high by 950 mm wide incorporating two 28 mm double-glazed units with 90% argon, soft coat (SN4 coating) and warm-edge spacer, with a visible area of 1.19 m² when calculated by computer simulation in accordance with BS EN ISO 10077-2 : 2003 is 1.6 Wm⁻²K⁻¹.

7.2 The overall thermal insulation of the door will be dependent on the performance of the double-glazed units. For units other than those described above, the indicative U values shown in Table 6e of *The Government's Standard Assessment Procedure for Energy Rating of Dwellings* (SAP 2005) can be used. When available, a certified U value by measurement to BS EN ISO 12567-1 : 2000, or

calculation to BS EN ISO 10077-1 : 2000 and BS EN ISO 10077-2 : 2003 should be used in preference to these data given in these tables.

Figure 3 Typical threshold sections



8 Condensation risk

Experience of PVC-U door systems similar to the Duraflex Diamond Suite PVC-U Residential Door System has shown that, in normal domestic or similar applications, PVC-U doors do not constitute significant condensation risk when correctly installed. Guidance on some satisfactory design details is given in *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002, Further information is contained in BRE report (BR 262 : 2002) *Thermal insulation : avoiding risks*.

9 Safety



Glazed doors and sidelights are fitted, where required, with safety glass complying with BS 6206 : 1981 or BS EN 12600 : 2002 and therefore meet the safety recommendations given in BS 6262-4 : 2005⁽¹⁾.

(1) Dealing with the safety of people upon impact with the glazing.

10 Security against intrusion

10.1 Diamond Suite doorsets are fitted with locking mechanisms and features as described in sections 1.11, 1.12 and 1.13 of this Detail Sheet.

They provide adequate security against unauthorised entry by the opportunist intruder, when judged against Clauses 5.4.4 and 6.14.1.3 of PAS 23-1 : 1999. Where relevant, reference should be made to NHBC Standards 2007, Chapter 6.7 *Doors, windows and glazing* and the *Zurich Building Guarantee Technical Manual 2007, Section 4 Superstructure, Sub-section, External walls — Doors, windows and roof lights* (pages 172, 174 and 175).

10.2 Attention should be paid to packing of glazing units and infilling adjacent to all locking and hinge points. In addition, frame fixings should coincide with the locating points of the locking system, with suitable packing installed between the frame and the fabric of the building.

10.3 Glazing beads fitted internally on doors and any associated sidelights are virtually impossible to remove from the outside. Glazing beads fitted externally have not been assessed.

11 Resistance to solar heat gain

White and woodgrain doorsets fitted with glazing will not suffer permanent distortion when subjected to temperatures equivalent to those likely to be attained in service in summer conditions.

12 Resistance to impact and slamming loads

12.1 Doorsets will be unaffected by the soft body or hard body impacts likely to be encountered in dwellings or similar applications.

12.2 Slamming of the door, such as could occur in high winds, will not cause damage to the door leaf or frame.

13 Ease of operation

The doors can be operated without difficulty when correctly installed.

14 Maintenance

14.1 The doors and sidelights can be re-glazed, and the gaskets and weatherstripping replaced, but these operations should be carried out by specialist operatives using the materials recommended by the Certificate holder specified on the Front Sheet and approved by the BBA. If a co-extruded glazing bead gasket is damaged, for example during re-glazing, it may be necessary to replace the complete bead. Replacements are available from the Certificate holder or from Duraflex Ltd.

14.2 If damage occurs, the furniture and fittings can be readily replaced by releasing the fixing screws and changing the fitting.

14.3 The PVC-U frame members can be cleaned using water containing household detergent. If dirt is allowed to build up on the members over long periods it may become more difficult to restore the surface appearance. Abrasive cleaners should not be used, particularly on woodgrain finishes as the


loss of the acrylic lacquer will have a serious effect on durability.

14.4 Care should be taken when using proprietary materials for cleaning the glass, to ensure that deposits are not allowed to remain on the PVC-U where they may cause discoloration and damage to the surface. In addition, care must be taken to avoid damage to, or discoloration of, the members when stripping paint from adjacent timber, for example, by means of a blowlamp or paint stripper.

14.5 Paints can adversely affect the impact strength of the PVC-U frame members. The application of dark colours to white profiles could lead to a risk of thermal distortion. Therefore painting is not recommended.

14.6 The hinges and locking mechanism should be cleaned and lubricated annually to minimise wear and to ensure smooth operation. More frequent lubrication may be required depending on the environmental conditions.

15 Durability

 15.1 Evidence is available on the performance in the UK and other Northern European countries of PVC-U similar to that used for the system over a period in excess of 15 years for woodgrain windows and in excess of 20 years for white windows. Such evidence, when compared with the results of tests on the Duraflex Diamond Suite PVC-U, indicates that the doorsets will have a life of at least 25 years. Any slight colour change or surface dulling that might occur will be uniform over the visible surfaces for both white and woodgrain finishes, assuming the latter case that the acrylic lacquer is undamaged.

15.2 Fittings, including the hinges, locking mechanism and operating handles, as described in this Detail Sheet, will have similar durability except where doorsets are to be installed in areas subject to particularly aggressive conditions. These conditions can prevail in coastal locations or near sources of industrial pollutants and replacement of fittings may be necessary within the life of the doorset.

15.3 The gaskets, weatherstripping and the mastic seal to the building structure may need to be replaced within the life of the doorset.

Installation

16 General

16.1 The Duraflex Diamond Suite PVC-U Residential Doorsets must be fixed into the opening, in accordance with the recommendations in BS 8213-4 : 2007, using proprietary expanding anchors through the frame or by galvanized steel fixing lugs.

16.2 For white PVC-U doorsets openings in new walls should be formed using a suitable template 10 mm wider and higher than the doorset to be installed. For woodgrain doorsets this should be increased to 15 mm. The doorset should not be built in at the construction stage.

17 Procedure

17.1 After checking the dimensions of the doorset, the frame is de-glazed if necessary and positioned in the opening. Holes are drilled through the outer frame and into the masonry to take fixing anchors. Alternatively, lugs are positioned on the frame and attached to the masonry by screws and plugs or other suitable mechanical fixing. In either case fixings must be positioned not less than 150 mm from corners and at centres not exceeding 600 mm. It is important to ensure that the door frame is installed vertically and free from twist and that through fixings in thresholds are sealed to prevent ingress of water.

17.2 All glazing or re-glazing of the doorset is undertaken as required using the technique fully described in the *Duraflex 65 mm/70 mm R.I.G. Fabrication Guides*.

17.3 The installation is completed by application of a silicone or similar durable sealant to the external perimeter joints as required and the fitting of trims to the interior.

Technical Investigations

The following is a summary of the technical investigations carried out on the Duraflex Diamond Suite PVC-U Residential Doorsets.

18 Tests

18.1 Tests were carried out in accordance with the methods defined in PAS 23-1 : 1999 to determine:

- operating forces
- air permeability
- watertightness
- wind resistance
- resistance to vertical loads
- resistance to static torsion
- slamming resistance
- closure against obstruction
- abusive forces on handles
- resistance to soft and heavy body impact
- resistance to hard body impact

- cyclic operation
- basic security.

18.2 Tests in accordance with MOAT No 8 : 1973 and MOAT No 17 : 1990 carried out on the Diamond Suite window system gave the results for the PVC-U extrusions as detailed in Table 5.

18.3 The thermal transmittance value of a reinforced Diamond Suite outward opening door, the top half of which was glazed and the bottom half also glazed was determined using computer simulation in accordance with BS EN ISO 10077-2 : 2003.

Table 5 PVC-U extrusion test results

Test	Results	
	White	Brown
Ash content (%)	6.36	4.47
Vicat softening temperature (°C)	92	89
Tensile strength (MPa)	44.47	46.73
Modulus of elasticity (MPa)	2471	2885
Tensile impact (kJm ⁻²)		
new material at 23°C	709	639
UV aged material	622	579
heat aged material	669	600
Induction time of dehydrochlorination (min)		
new material	76.6	65.7
UV aged material	49.7	58.2
heat aged material	68.6	53.1
Impact test at -10°C	pass	
Shrinkage on heating at 100°C for 1 hour	<2%	
Verification of gelation	pass	

18.4 Additional test work in accordance with MOAT No 57 : 1995, BS 7722 : 1994 and BS EN 763 : 1995 was carried out on woodgrain finish windows and doors and associated profiles to determine:

Doors

- effect of solar heat gain

Profiles

- colourfastness of surface foil
- adhesion to substrate profile
- abrasion and scratch resistance
- retention of impact strength
- corner finishing
- stress relief of injection-moulded profiles.

19 Investigations

The profile manufacturing process and the doorset fabrication procedure including, in each case, the methods adopted for quality control, have been examined and found satisfactory by the BBA.

Bibliography

BS 1474 : 1987 *Specification for wrought aluminium and aluminium alloys for general engineering purposes: bars, extruded round tubes and sections*

BS 6206 : 1981 *Specification for impact performance requirements for flat safety glass and safety plastics for use in buildings*

BS 6262-1 : 2005 *Glazing for buildings — General methodology for the selection of glazing*
BS 6262-4 : 2005 *Glazing of buildings — Codes of practice for safety related to human impact*

BS 7722 : 1994 *Specification for surface covered PVC-U extruded hollow profiles with heat welded corner joints for plastics windows*

BS 8213-4 : 2007 *Windows, doors and rooflights — Code of practice for the survey and installation of windows and external doorsets*

BS EN 755-2 : 1997 *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles — Mechanical properties*

BS EN 763 : 1995 *Plastics piping and ducting systems — Injection-moulded thermoplastics fittings — Test method for visually assessing effects of heating*

BS EN 10327 : 2004 *Continuously hot-dip coated strip and sheet of low carbon steels for cold forming — Technical delivery conditions*

BS EN 12600 : 2002 *Glass in building — Pendulum test — Impact test method and classification for flat glass*

BS EN ISO 10077-1 : 2000 *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 1 — Simplified method*

BS EN ISO 10077-2 : 2003 *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Part 2 — Numerical method for frames*

BS EN ISO 12567-1 : 2000 *Thermal performance of windows and doors — Determination of thermal transmittance by hot box method — Complete windows and doors*

MOAT No 8 : 1973 *Directive for Rigid PVC Products Used Externally in Building*

MOAT No 17 : 1990 *UEAtc Technical Guide for the Agrément of Windows in PVC-U*

MOAT No 57 : 1995 *UEAtc Technical Report for the assessment of windows in coloured PVC-U*

PAS 23-1 : 1999 *General performance requirements for doors assemblies. Single leaf, external door assemblies to dwellings*



On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'G. A. Cooper'.

Date of Second edition: 4th December 2007

Chief Executive