



## Anglian Windows Limited

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**Agrément  
Certificate  
No 94/3000**  
Second issue\*

Designated by Government  
to issue  
European Technical  
Approvals

## ANGLIAN PVC-U DOOR SYSTEM

Porte  
Tur

## Product



• THIS CERTIFICATE RELATES TO THE ANGLIAN PVC-U DOOR SYSTEM COMPRISING THE DOORSET TYPES AND SIZES REFERRED TO IN THE ACCOMPANYING DETAIL SHEETS.


• The doorsets referred to in the Detail Sheets are fabricated and marketed by Anglian Windows Limited at the above address.

• The doorsets in the Anglian range are for use in the exposure situations described in the relevant Detail Sheets.


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

## 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 doorsets can contribute to achieving compliance. In the opinion of the BBA, the position of the Anglian 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 Standards (Scotland) Regulations

 In the opinion of the BBA, the position of the Anglian 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 Anglian 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 Anglian 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:

- (a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;
- (b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;
- (c) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;
- (d) is copyright of the BBA.

5.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

5.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) thereof:

- (a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked by the BBA or its agents; and

(c) are reviewed by the BBA as and when it considers appropriate.

5.4 In granting this Certificate, the BBA makes no representation as to:

- (a) the presence or absence of any patent or similar rights subsisting in the product or any other product;
- (b) the right of the Certificate holder to market, supply, install or maintain the product; and
- (c) the nature of individual installations of the product, including methods and workmanship.

5.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do 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 or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future 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 installation and use of this product.



In the opinion of the British Board of Agrément, the Anglian PVC-U Door System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 94/3000 is accordingly awarded to Anglian Windows Limited.

On behalf of the British Board of Agrément

A handwritten signature in black ink, appearing to read 'P. C. Hewitt'.

Date of Second issue: 10th November 1999

Chief Executive

*\*Original Certificate issued on 13th June 1994. This amended version issued to include an updated list of associated Detail Sheets and new Conditions of Certification.*

## Associated Detail Sheets

The following Detail Sheets are part of this Certificate:

Detail sheet	Edition	Date of issue	No of pages	Imprint ref	Title	System status
1	3	27th August 1998	2	O3BRD1	PVC-U Door System Building Regulations	Current
2	2	10th November 1999	8	O2ALD2	The Anglian White Knight PVC-U Residential Doorsets	Current
3	1	10th November 1999	8	O1ALD3	The Anglian White Knight PVC-U Sliding Patio Door	Current



## PVC-U DOOR SYSTEM


### DETAIL SHEET 1

Edition 3

No of pages 4

## Regulations

### 1 The Building Regulations 1991 (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 contribute to meeting the relevant requirements.

Requirement: L1	Conservation of fuel and power
Comment:	In calculating the heat loss through doors the U values given in section 7 of the relevant Detail Sheets 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.
Requirements: N1 and N2	Protection against impact and 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 should be used to meet the requirements of N1. See relevant sections of the accompanying Detail Sheets. 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 them.
Requirement: Regulation 7	Materials and workmanship
Comment:	The product is acceptable.  In addition to the contribution which the product can make to meeting the relevant requirements, the following should be noted:
Requirement: B3	Internal fire spread (structure)
	The doors do not have an established fire resistance rating and should not be used where fire resistance requirements apply.

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## 2 The Building Standards (Scotland) Regulations 1990 (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 Technical Standards as listed below.

<b>Regulation:</b>	10	Fitness of Materials
<b>Standard:</b>	B2.1	Selection and use of materials and components
<b>Comment:</b>		The PVC-U door system complies with the requirements of this Standard.
<b>Regulation:</b>	13	Means of escape from fire, facilities for fire-fighting and means of warning of fire in dwellings
<b>Standard:</b>	E3.5	Clear height of escape routes or circulation areas
<b>Standard:</b>	E3.6	Width of escape routes
<b>Comment:</b>		When a PVC-U door is fitted in an escape route the unobstructed height and width can be calculated using the profile dimensions indicated in the relevant sections of the accompanying Detail Sheets.
<b>Regulations:</b>	17 and 18	Preparation of sites and resistance to moisture
<b>Standard:</b>	G3.1	Resistance to precipitation
<b>Comment:</b>		Walls incorporating the product, installed and used in accordance with the provisions of this Certificate, can meet Standard G3.1. See the relevant table of the accompanying Detail Sheets.
<b>Regulation:</b>	27	Miscellaneous hazards
<b>Standard:</b>	P2.2	Collision with glazing
<b>Comment:</b>		Glazing must comply with the details in BS 6262 where accidental collision with it is likely. See section 8 of the relevant Detail Sheets.

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## 3 The Building Regulations (Northern Ireland) 1994 (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 Regulations as listed below.

Regulation:	<b>B2</b>	Fitness of materials and workmanship
Comment:		The doors are acceptable. See the relevant section of the accompanying Detail Sheets.
Regulation:	<b>C5</b>	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:	<b>E2</b>	Means of escape
Regulation:	<b>E3</b>	Deemed-to-satisfy provisions for means of escape
Comment:		When the door is fitted in an escape route, the actual width between door jambs can be determined using the profile dimensions indicated in the relevant section of the accompanying Detail Sheet.  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.
Regulation:	<b>H5</b>	Guarding
Regulation:	<b>H6</b>	Deemed-to-satisfy provisions for guarding
		Glazing less than 1500 mm above floor or ground level indoors and side panels should meet the requirements of DoE(NI) Technical Booklet H, June 1994. Except where only small panes are fitted, glass and plastic sheet which satisfy the test requirements of BS 6206 should be used to meet the requirements of Technical Booklet H.
Regulation:	<b>V1</b>	Glazing
Regulation:	<b>V2</b>	Deemed-to-satisfy provision for glazing
Comment:		Where people are likely to come into contact with glazing in a building the requirements of this Regulation shall be deemed to be satisfied if the glazing complies with DoE(NI) Technical Booklet V, Sections 1 and 2, June 1994.
Regulation:	<b>V3</b>	Transparent glazing
Regulation:	<b>V4</b>	Deemed-to-satisfy provision for 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 this Regulation shall be deemed to be satisfied if the glazing complies with DoE(NI) Technical Booklet V, Section 3, June 1994.

## 4 Construction (Design and Management) Regulations 1994

Information in this Certificate may assist the client, planning supervisor, designer and contractor to address their obligations under these Regulations.

See section: *2 Delivery and site handling* of the relevant Detail Sheets.



On behalf of the British Board of Agrément

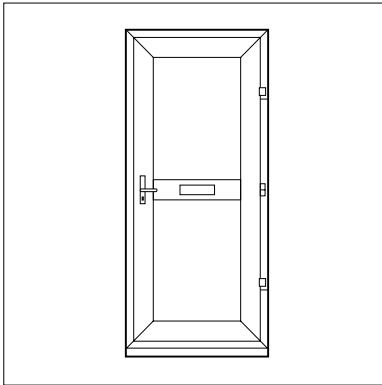
Date of issue: 27th August 1998

*P. C. Hewson*  
Director



## THE ANGLIAN WHITE KNIGHT 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 ANGLIAN WHITE KNIGHT PVC-U RESIDENTIAL DOORSETS.
- The system comprises single outward or inward opening doorsets, with or without fixed sidelights, and double outward or inward opening doorsets, all framed in white PVC-U and glazed internally with sealed double-glazed units or insulated infill panels.
- The doorsets are for external use as primary or secondary access doors in dwellings or similar applications where the test pressure classes for windows defined in BS 6375 : Part 1 : 1989 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.

### Technical Specification

#### 1 Description

1.1 The Anglian White Knight Residential Doorsets (see Figure 1) are fabricated from white unplasticized polyvinyl chloride (PVC-U) profiles, produced by conventional extrusion techniques, from material complying with Case B (PVC-U with additional polymers), as defined in BBA MOAT No 17 : 1990. The profiles covered by this Certificate are those 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 Anglian *Technical Data Files* TDF No 004.

1.3 Doorsets with sidelight frames incorporate mullions connected to the outer frame by means of welded joints. Double doors (see Figure 3) incorporate a meeting stile attached to one leaf.

1.4 The PVC-U extrusions are cut to length and all holes routed or drilled. Where required, galvanized steel 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 at the weld. The door is completed by fitting the weatherstripping and securing the furniture in position with screws. A typical head corner detail is shown in Figure 4.

Figure 1 Corner and mid-rail detail

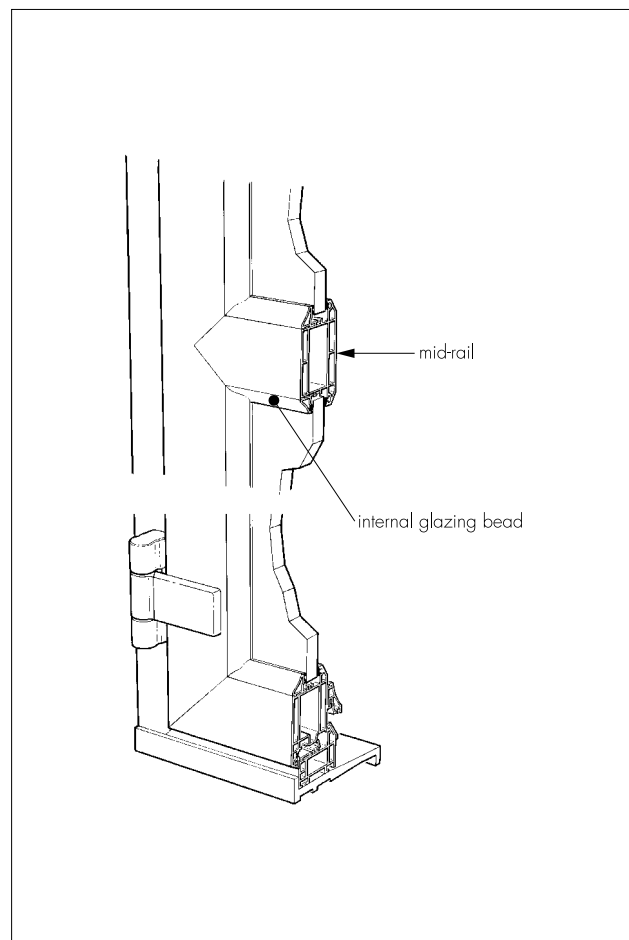


Table 1 Profiles

Manufacturer's designation	Profile type	Application
8960	L-section	outer frame (excluding threshold)
8900	L-section	outer frame (threshold)
8962	T-section	mullion
8963	Z-section	mullion
8967	T-section	meeting stile (double doors)
8964	Z-section	door leaf (open-in)
8965	T-section	door leaf (open-out)
8966	T-section	mid-rail
8937	—	low threshold sill
20023	—	coextruded glazing bead (24 mm)
10839	—	glazing gasket
8343	—	weatherseal (centre)
8344	—	weatherseal (internal)
EXM154	—	steel reinforcement (8960)
STR 357	—	steel reinforcement (8962, 8963)
EXM 122	—	steel reinforcement (8964, 8965)
EXM 173	—	steel reinforcement (8964, 8965)
8909	—	weatherbar
8950	—	head drip

1.5 Drainage is provided by a series of slots, 26 mm by 6 mm, positioned in accordance with the Anglian *Technical Data Files* TDF No 004. Inward opening doors are fitted with a weatherbar at threshold level.

### Reinforcement

1.6 The outer frame, excluding the threshold member, is reinforced with galvanized steel in all members. The threshold member is not reinforced. All outer frame reinforcement is in accordance with the rules given in Anglian *Technical Data Files* TDF No 004.

1.7 The main members of door leaves are fully reinforced with galvanized steel in accordance with the rules given in the Anglian *Technical Data Files* TDF No 004. Mid-rails are not reinforced.

1.8 Mullions are reinforced with galvanized steel in accordance with the rules given in the Anglian *Technical Data Files* TDF No 004.

1.9 Galvanized steel reinforcement is roll-formed from material with a G Z 275N coating complying with BS EN 10142 : 1991.

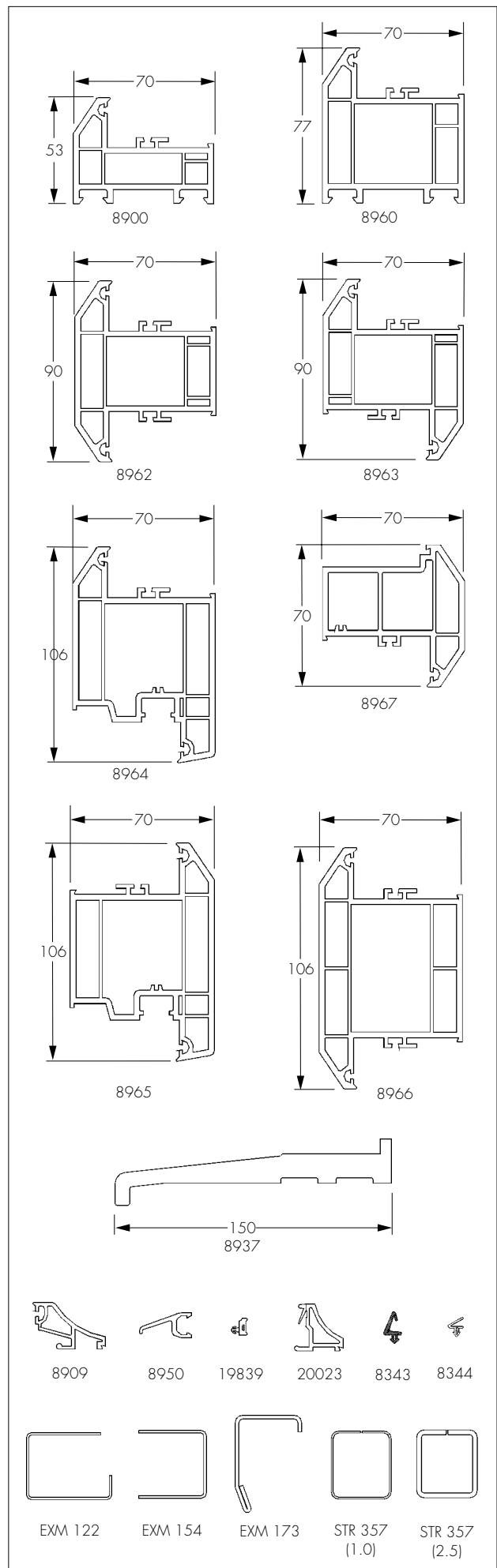
### Size range

1.10 This Detail Sheet covers Anglian White Knight residential doorsets with sidelight frames within the limitations shown in Table 2.

Table 2 Size restriction

	Dimension (mm)	
	width	height
<i>Single-leaf glazed doorsets</i>		
Maximum overall size	1100	2350
<i>Doorsets with a sidelight</i>		
Maximum overall size	1500	2350
<i>Double-leaf glazed doorsets</i>		
Maximum overall size	2100	2100

Figure 2 Profiles



## Furniture and fittings

1.11 All doors covered by this Detail Sheet are hung on two heavy duty adjustable butt hinges, each fixed to the frame and door leaf with screws penetrating the reinforcement. Additionally, an anti-bow device is located centrally between the two hinges. The hinges are designed to offer enhanced protection against being forced.

Figure 3 Double doorset detail

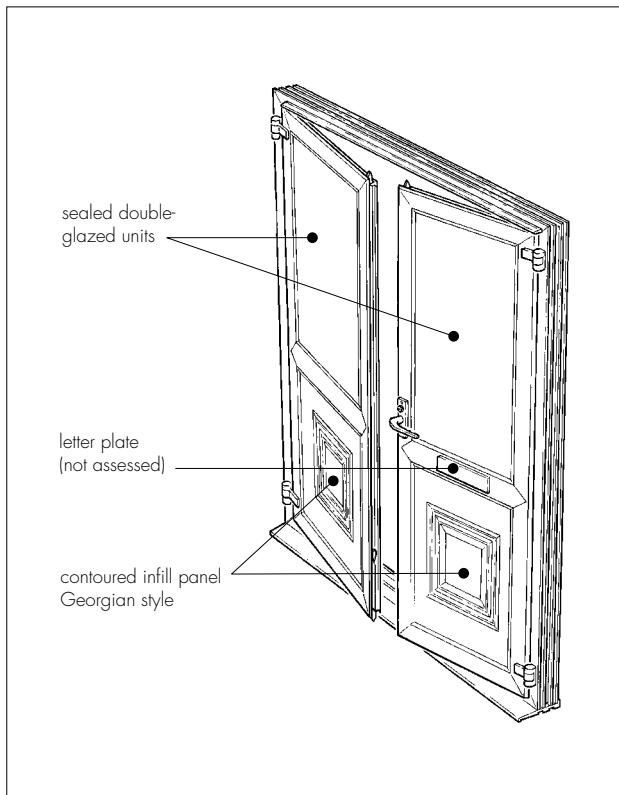
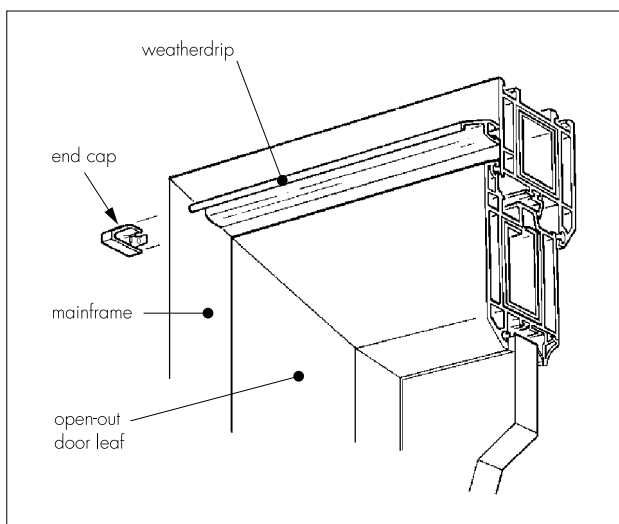


Figure 4 Head corner detail



1.12 Single-leaf doors are fastened by a multi-bolt lock with three dead bolts and a hook lock operated by a handle available as either lever type on both sides or lever on the inside face and pad on the outside. Both types of handle are available in brass or silver effect finish or with a white or black painted finish. Double-leaf doors are fastened by a cremone bolt incorporating roller bolts, top

and bottom shoot bolts and a centre latch, all fitted to the first opening leaf. The second leaf incorporates shoot bolts at top and bottom. All locks are supplied with adjustable keeps and are fitted with a conventional 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.

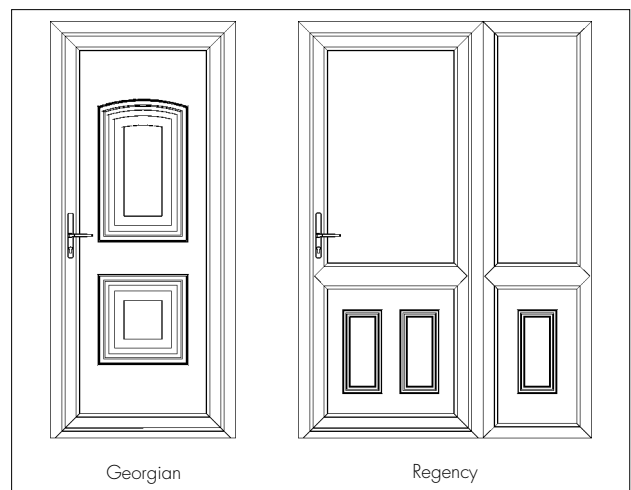
## Glazing and infilling

1.15 Doors and sidelights are available fully glazed, fully panelled or part glazed, part panelled. In addition, door panels are available with glazed inserts. The doors are supplied with glazing and infill panels fitted in position.

1.16 Where glass is to be used, the doors are supplied using sealed double-glazed units with glass thicknesses in accordance with BS 6262 : 1982. All glass used is safety glass (see section 8).

1.17 Insulated infill panels are available contoured to standard door patterns (see Figure 5), or plain. Contoured panels are of sandwich construction comprising an inner and outer white skin with an infill of insulation material encompassing an aluminium or steel security layer. Plain panels are of white plastisol-coated steel skins and a polystyrene foam core. Details of currently approved panel types can be obtained from the BBA.

Figure 5 Typical contoured panel doors



## Weatherstripping and gaskets

1.18 Weatherstripping, extruded from EPDM or TPE, is located in grooves around the periphery of the door leaf and the centre of the fixed frame.

1.19 Door leaves and sidelights use EPDM or TPE gaskets to seal the glazing units or infill panels against the frame members. The glazing units or infill panels are secured with coextruded glazing beads.

## Quality control

1.20 Quality control includes checks on all materials and components, in particular:

### PVC-U compound

bulk density  
pourability

### Extruded profiles

dimensions  
colour  
heat reversion  
resistance to cold impact  
gelation

### 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 fully glazed. For transportation they are suitably protected with cardboard.

2.2 Each doorset has a label bearing the 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, on edge and suitably supported to avoid distortion or damage.

2.4 The weight of individual glazed door leaves, where required for manual handling operations, can be obtained from Anglian Windows Limited.

## Design Data

### 3 General

3.1 In accordance with the recommendations given in BBA MOAT No 11 : 1969, the doors and sidelight frames, for the purpose of assessing weathertightness, are considered as windows. Accordingly, selected samples from the Anglian White Knight PVC-U Residential Doorsets covered by this Detail Sheet were tested in accordance with BBA MOAT No 1 : 1974. Assessment of the test results shows that the products, within the range described in section 1.10, are suitable for use where the test pressure classes defined in BS 6375 : Part 1 : 1989 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.

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

Table 3 Test pressure class

	BS 6375 : Part 1 : 1989 Test pressure class (Pa)	MOAT No 1 Grading
<i>Strength and stability</i>		
Single-leaf doorsets	2000	V <sub>3</sub>
Doorsets incorporating a sidelight:		
up to 2100 mm high	1600	V <sub>2</sub>
up to 2350 mm high	1200	V <sub>2</sub>
Double-leaf doorsets	1200	V <sub>2</sub>
<i>Watertightness</i>		
Single-leaf inward opening doorsets	300	E <sub>4</sub>
All other doorsets	300	E <sub>3</sub>
<i>Air permeability</i>		
Inward opening doorsets	300	A <sub>2</sub>
Outward opening doorsets	600	A <sub>3</sub>

V<sub>2</sub> indicates that windows meet deformation requirements at 1000 Pa, a cycling test at 750 Pa and a safety test at 2000 Pa.

V<sub>3</sub> indicates that windows meet deformation requirements at 1750 Pa, a cycling test at 1250 Pa and a safety test at 3000 Pa.

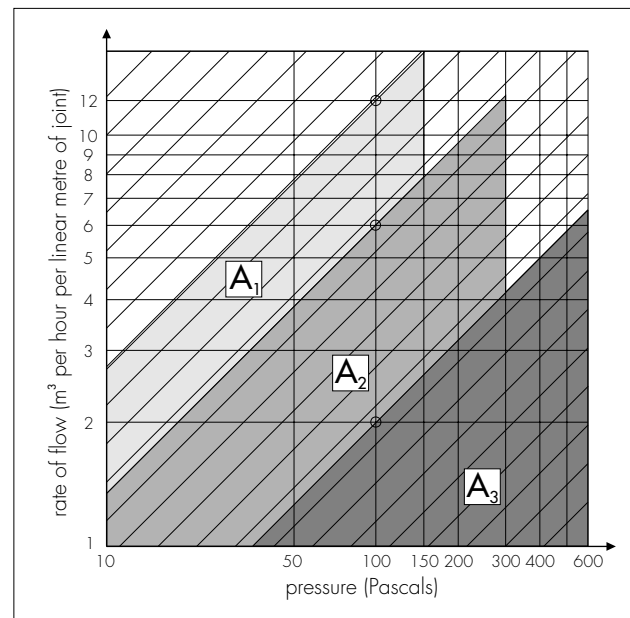
E<sub>3</sub> indicates water leakage occurring between 300 and 499 Pa.

E<sub>4</sub> indicates no water leakage occurring at 500 Pa.

A<sub>2</sub> indicates an airflow rate below the line passing the point for a rate of flow of 6 m<sup>3</sup>h<sup>-1</sup>m<sup>-1</sup> at 100 Pa pressure, when tested up to a pressure of 300 Pa (see Figure 6).

A<sub>3</sub> indicates an airflow rate below the line passing the point for a rate of flow of 2 m<sup>3</sup>h<sup>-1</sup>m<sup>-1</sup> at 100 Pa pressure, when tested up to a pressure of 600 Pa (see Figure 6).

Figure 6 Air permeability grade



### 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, Anglian White Knight 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 window area the approximate unobstructed area can be determined by deducting from the overall height and width the dimensions given in Table 4.

Table 4 Determination of unobstructed glass area

Feature	Deduction from overall height and width (mm)
Outer frame in sidelight	77
Mullion and door stile	120 <sup>(1)</sup>
Door threshold and bottom rail	128
Outer frame and door stile	152
Mid-rail	118
Centre stile (double-leaf doors)	110 <sup>(1)</sup>

(1) from centre of mullion

## 6 Unobstructed opening area



When a residential doorset is fitted in an escape route, the unobstructed width and height can be calculated by deducting 154 mm from the overall door width and 130 mm from the overall door height.

## 7 Thermal transmittance and condensation risk

7.1 The thermal transmittance value (U value) of an Anglian White Knight Residential Door, 2096 mm high by 1048 mm wide incorporating a single sealed double-glazed unit with a visible area 1035 mm high by 745 mm wide and a lower plain, white, steel faced panel, when measured by the Guarded Hot Box Method according to BS 874 : Part 3 : Section 3.1 : 1987, is  $1.92 \pm 0.19 \text{ Wm}^{-2}\text{K}^{-1}$ .

7.2 For condensation to occur on any surface the temperature of that surface must fall below the dew-point of the air adjacent to it. This will happen to the internal surface of the glazing before it happens to the internal surfaces of the frame or the panel. Therefore, if condensation occurs it will form on the glass first. With air at 20°C and 65% RH next to the internal surfaces of the door tested in section 7.1, the external temperature must fall below 11°C for this to happen anywhere on the glass, below -5°C for it to happen anywhere on the frame, below -16°C for it to happen on the majority of the frame and below -5°C before it happens on the majority of the glazing.

## 8 Safety

Glazed doors and sidelights are fitted, where required, with safety glass complying with BS 6206 : 1981 and therefore meet the safety recommendations given in BS 6262 : Part 4 : 1994.

## 9 Security against intrusion

9.1 Anglian White Knight doorsets are fitted with locking mechanisms and features as described in

sections 1.11, 1.12 and 1.13. They provide adequate security against unauthorised entry by the opportunist intruder, when judged against clauses 6.3.2 and 6.3.3 of BRE Occasional Paper (OP 57), December 1993 involving manipulation with small hand tools and forces applied with tools such as a 330 mm long nail bar or a 250 mm long screwdriver. Where relevant, reference should be made to NHBC Standards, Chapter 6.7.

9.2 Inward and outward opening doors, and any associated sidelights, are fitted with internal glazing beads which cannot be removed from the outside.

9.3 Attention should be paid to packing of glazing units or infill panels 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 Resistance to solar heat gain

Doorsets will not suffer permanent distortion when subjected to temperatures equivalent to those likely to be attained in service in summer conditions.

## 11 Resistance to impact and slamming loads

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

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

## 12 Ease of operation

The doors can be operated without difficulty when correctly installed.

## 13 Maintenance

13.1 The doors and sidelights can be re-glazed, the infill panels replaced and the gaskets and weatherstripping replaced, but these operations should be carried out by Anglian Windows Limited using the materials approved by the BBA. If the coextruded glazing bead gasket is damaged, for example during re-glazing, it may be necessary to replace the complete bead.

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

13.3 The PVC-U frame members can be cleaned using water containing household detergent, as instructed on the reverse of the Anglian warranty document. If dirt is allowed to build up on the members over long periods it may become more difficult to restore the surface appearance.

13.4 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 discolouration and damage to the surface. In addition, care must be taken to avoid damage to, or discolouration of, the members when stripping paint from adjacent timber, for example, by means of a blowlamp or paint stripper.

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

13.6 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.

### 14 Durability



14.1 Evidence is available on the performance in the UK of PVC-U similar to that used for the framing members over a period of 15 years in windows and in excess of 20 years in other external applications. Such evidence, when compared with the results of tests on the Anglian White Knight PVC-U, indicates that the doorsets will have a life of at least 25 years. Any slight colour change or surface dulling which might occur will be uniform over the visible surfaces of the door frames.

14.2 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.

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

### 15 General

15.1 The doorsets must be fixed into the opening, in accordance with the recommendations in the *Anglian Technical Data Files* TDF No 004, by proprietary expanding anchors through the frame. Replacement doors should be fitted in accordance with BS 8213 : Part 4 : 1990, in particular with reference to clause 9.3.1.

15.2 Openings in new walls should be formed using a suitable template 10 mm wider and 5 mm higher than the doorset to be installed. The doorset should not be built in at the construction stage.

### 16 Procedure

16.1 After checking the dimensions of the doorset, it is de-glazed or the infill panels removed, if necessary, and positioned in the opening. Holes are drilled through the outer frame and into the masonry to take fixing anchors. 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.

16.2 All re-glazing or replacing the infill panels of the doorset is undertaken as required using the technique fully described in the *Anglian Technical Data Files* TDF No 004.

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

The following is a summary of the technical investigations carried out on the Anglian White Knight PVC-U Residential Doorsets.

### 17 Tests

17.1 Tests were carried out in accordance with the methods defined in MOAT No 1 : 1974 to determine:

air permeability  
watertightness  
effect of wind loads.

17.2 Tests were carried out in accordance with the methods defined in MOAT No 11 : 1969 to determine:

resistance to impact, racking and bending loads  
ease of operation  
effect of slamming  
effect of solar heating.

17.3 Tests in accordance with MOAT No 8 : 1973 and MOAT No 17 : 1990 gave the results for the PVC-U extrusions as detailed in Table 5.

17.4 The thermal transmittance value of a single leaf, part glazed, part panelled door was measured by the BBA using the Guarded Hot Box Method.

Table 5 PVC-U extrusion test results

Test	Result
ash content (%)	7.55
Vicat softening temperature (°C)	84
tensile strength (MPa)	46
modulus of elasticity (MPa)	2640
tensile impact (kJm <sup>-2</sup> ):	
new material	685 ± 103
aged material <sup>(1)</sup>	590 ± 83
induction time of dehydrochlorination (min):	
new material	122
aged material <sup>(1)</sup>	113
impact test at -10°C	pass
shrinkage on heating at 100°C for 1 hour	<2%
verification of gelation by heating	pass

(1) Heat aged in a ventilated oven at 80°C for 56 days.

### 18 Other investigations

18.1 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.

18.2 A cyclic operation test, involving opening and closing of an Anglian White Knight door with repeated operation of deadbolts and lock cylinder, was carried out by the BBA. A total of over 30 000 operations was completed satisfactorily.

18.3 A forced-entry test was carried out by the BBA.

## Bibliography

BS 874 *Methods for determining thermal insulating properties*

Part 3 *Tests for thermal transmittance and conductance*

Section 3.1 : 1987 *Guarded hot-box method*

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

BS 6262 : 1982 *Code of practice for glazing for buildings*

BS 6375 *Performance of windows*

Part 1 : 1989 *Classification for weathertightness (including guidance on selection and specification)*

BS 8213 *Windows, doors and rooflights*

Part 4 : 1990 *Code of practice for the installation of replacement windows and doorsets in dwellings*

BS EN 10142 : 1991 *Specification for continuously hot-dip zinc coated low carbon steel sheet and strip for cold forming: technical delivery conditions*

MOAT No 1 : 1974 *Directive for the Assessment of Windows*

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

MOAT No 11 : 1969 *Directive for the Assessment of Doors*

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

BRE Occasional Paper (OP 57), December 1993 *Proposals for a standard for the security of doorsets*



On behalf of the British Board of Agrément

Date of Second issue: 10th November 1999

Chief Executive

*\*Original Detail Sheet issued on 13th June 1994. This amended version issued to include re-numbering of three profiles.*



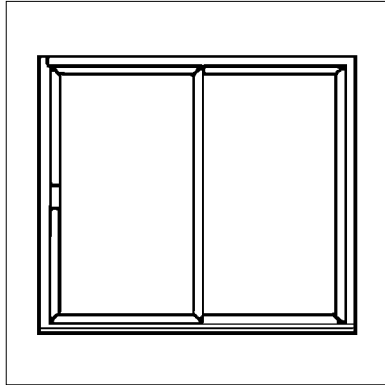
## THE ANGLIAN WHITE KNIGHT PVC-U SLIDING PATIO DOORS

### DETAIL SHEET 3

Edition 1

No of pages 8

## 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 ANGLIAN WHITE KNIGHT SLIDING PATIO DOORS.
- The system comprises a combination of sliding and fixed door leaves, all framed in white PVC-U and glazed internally with sealed double-glazed units.
- The doors are for external use as secondary access doors in dwellings or similar applications where the test pressure classes for windows defined in BS 6375 : Part 1 : 1989 and indicated in Table 3 are applicable.
- It is essential that the doors are installed and maintained in accordance with the conditions set out in the Design Data and Installation parts of this Detail Sheet.

## Technical Specification

### 1 Description

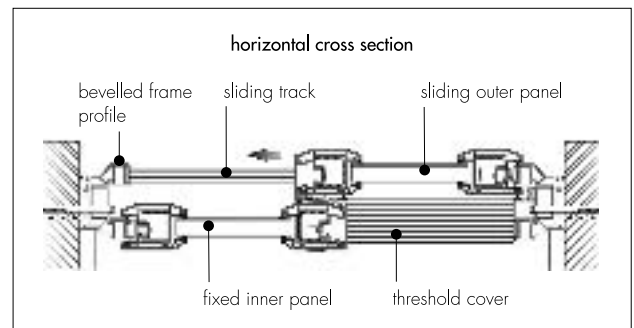
1.1 The Anglian White Knight Sliding Patio Doors (see Figure 1) are fabricated from white unplasticized polyvinyl chloride (PVC-U) profiles, produced by conventional extrusion techniques, from material complying with Case B (PVC-U with additional polymers), as defined in BBA MOAT No 17 : 1990. The profiles covered by this Certificate are those 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 Anglian *Technical Data Files* TDF No 044.

1.3 Outer frames sections are mitred, mechanically jointed and sealed to a corner moulding at the time of installation (see Figure 3) or alternatively, are heat welded at the time of manufacture.

1.4 The PVC-U extrusions are cut to length and all holes routed or drilled. Where required, galvanized steel 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 at the weld. The door is completed by fitting the weatherstripping and securing the furniture in position with screws. A typical head detail is shown in Figure 4.

Figure 1 Horizontal cross section



1.5 Drainage is provided by a series of slots, 26 mm by 6 mm, positioned in accordance with the Anglian *Technical Data Files* TDF No 044. The head of the frame is fitted with a head drip.

### Reinforcement

1.6 The outer frame is reinforced with galvanized steel in all members. All outer frame reinforcement is in accordance with the rules given in Anglian *Technical Data Files* TDF No 044.

1.7 The jamb members of door leaves are reinforced with galvanized steel in accordance with the rules given in the Anglian *Technical Data Files* TDF No 044.

1.8 The meeting stile members are reinforced with galvanized steel in accordance with the rules given in the Anglian *Technical Data Files* TDF No 044.

1.9 Galvanized steel reinforcement is roll-formed from material with a G Z 275N coating complying with BS EN 10142 : 1991.

Table 1 Profiles

Manufacturer's designation	Application
20012	outer frame
20013	door leaf
8937	sill
20024	coextruded glazing bead (24 mm)
10839	glazing gasket
8269	weatherseal
EXM 147	steel reinforcement (20012)
EXM 148	steel reinforcement (20013)
EXM 149	steel reinforcement (20013)
EXA 258	aluminium reinforcement (20013)
8910	head drip

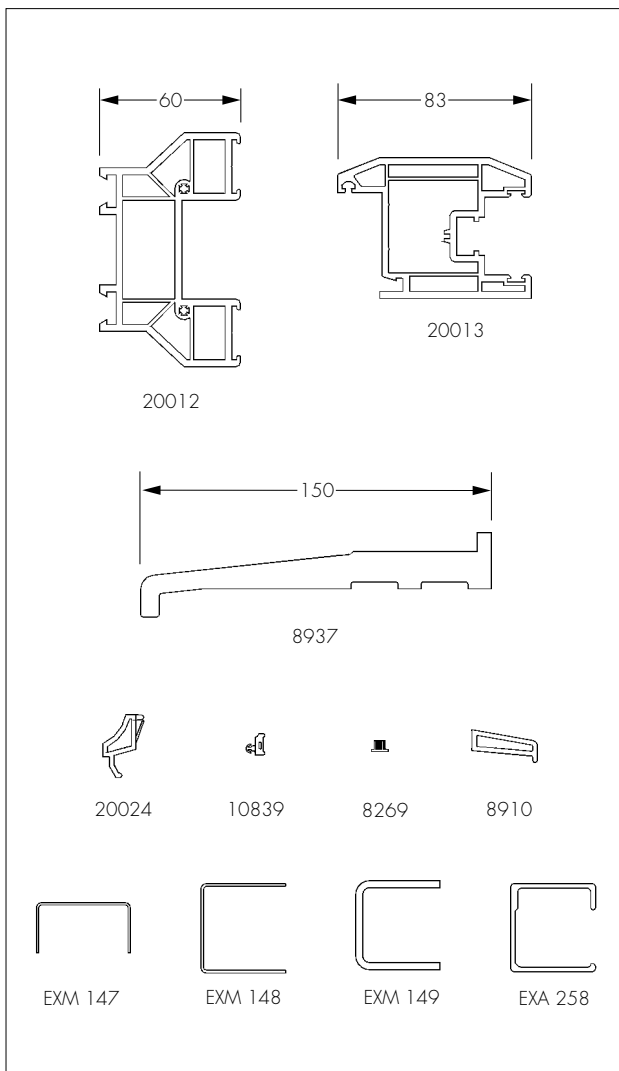
## Size range

1.10 This Detail Sheet covers Anglian White Knight patio doors with two leaves within the limitations shown in Table 2.

Table 2 Size restriction

	Dimension (mm)	
	width	height
Double-leaf glazed doors Maximum overall size	2400	2400

Figure 2 Profiles



## Furniture and fittings

1.11 Sliding door leaves have two adjustable height rollers fitted at either end of the bottom rail (see Figure 5).

1.12 Doors are secured by a multi-point locking mechanism incorporating mushroom headed bolts, anti-lift pin and top shootbolts. A central plunger lock is fitted to the meeting stile, with the option of a second, in which case one is fitted at the top and one at the bottom. Continuous interlocking aluminium profiles lock the meeting stiles together in the closed position. Handles are available in silver, white, black or brass effect (see Figure 6).

Figure 3 Corner detail

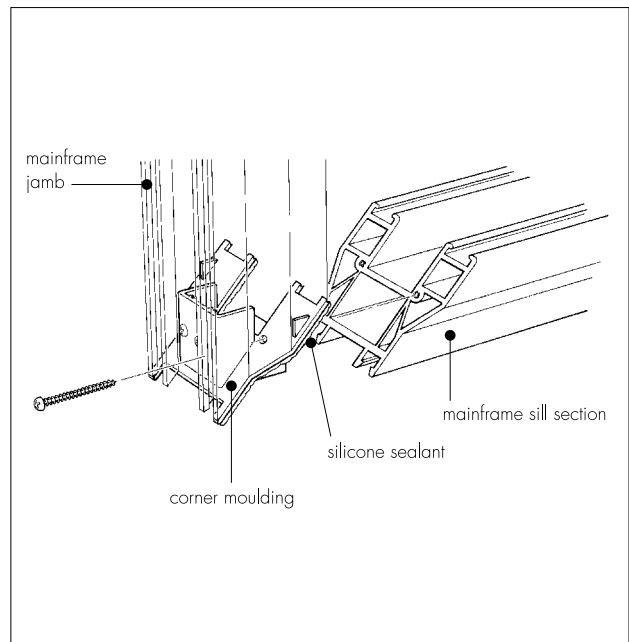


Figure 4 Head detail

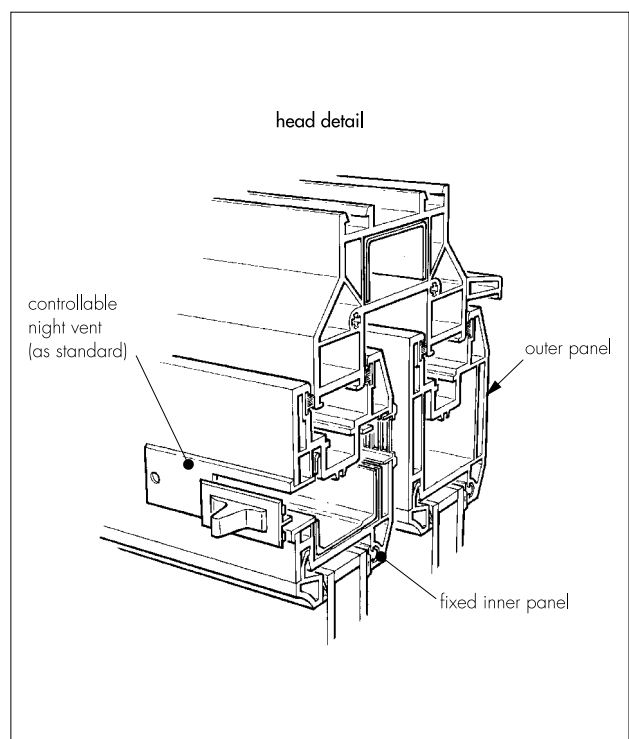


Figure 5 Sill detail

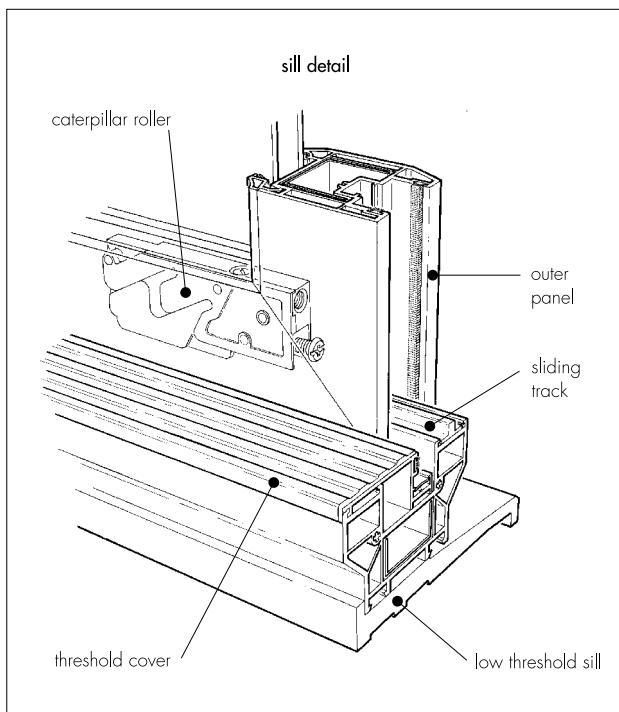
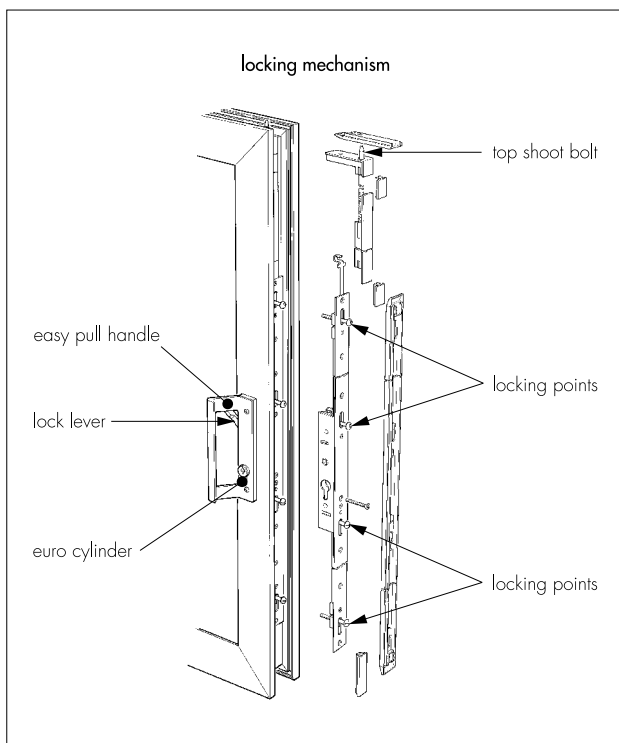


Figure 6 Locking mechanism detail



1.13 Details of currently approved locks and other fittings can be obtained from the BBA.

### Glazing and infilling

1.14 Patio doors are supplied fully glazed using sealed double-glazed units with glass thicknesses in accordance with BS 6262 : 1982. All glass used is safety glass (see section 8).

### Weatherstripping and gaskets

1.15 Weatherstripping, made from polypropylene pile is located in grooves around the periphery of each door leaf.

1.16 EPDM TPR gaskets seal the glazing units against the frame members. The glazing units are secured with coextruded glazing beads incorporating black gaskets.

### Quality control

1.17 Quality control includes checks on all materials and components, in particular:

#### PVC-U compound

bulk density  
pourability

#### Extruded profiles

dimensions  
colour  
heat reversion  
resistance to cold impact  
gelation

#### 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 patio door leaves are delivered to site fully glazed. For transportation they are suitably protected with cardboard.

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

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

2.4 The weight of individual glazed door leaves, where required for manual handling operations, can be obtained from Anglian Windows Ltd.

## Design Data

### 3 General

3.1 In accordance with the recommendations given in BBA MOAT No 11 : 1969, the patio doors, for the purpose of assessing weathertightness, are considered as windows. Accordingly, selected samples from the Anglian White Knight PVC-U Sliding Patio Doors covered by this Detail Sheet were tested in accordance with BBA MOAT No 1 : 1974. Assessment of the test results shows that the products, within the range described in section 1.10, are suitable for use where the test pressure classes defined in BS 6375 : Part 1 : 1989 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.

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

Table 3 Test pressure class

	BS 6375 : Part 1 : 1989 Test pressure class (Pa)	MOAT No 1 Grading
<i>Strength and stability</i>		
Two-part patio doors:		
up to 2100 mm high x 1800 mm wide	1600	V <sub>2</sub>
up to 2100 mm high x 2100 mm wide	1200	V <sub>2</sub>
up to 2400 mm high x 2400 mm wide	800	V <sub>1</sub>
<i>Watertightness</i>		
All doors	300	E <sub>3</sub>
<i>Air permeability</i>		
All doors	600	A <sub>3</sub>

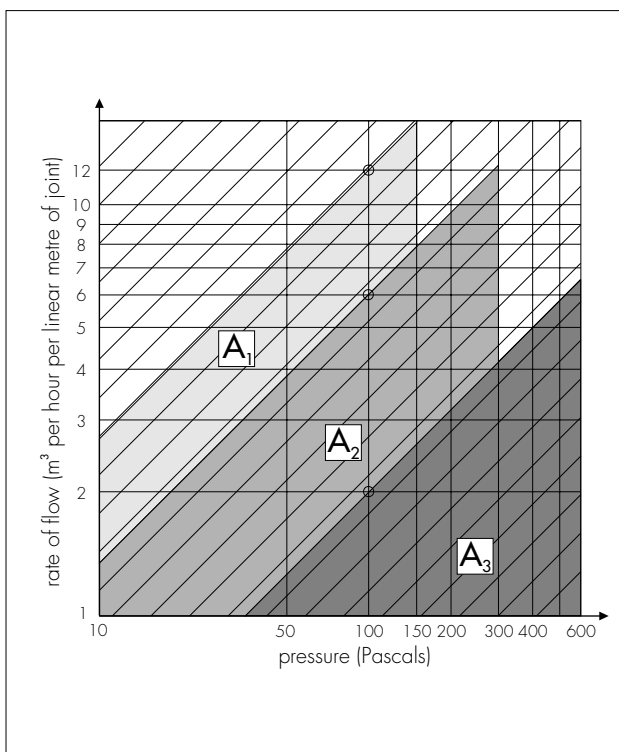
V<sub>1</sub> indicates that windows meet deformation requirements at 500 Pa, a cycling test at 300 Pa and a safety test at 1000 Pa.

V<sub>2</sub> indicates that windows meet deformation requirements at 1000 Pa, a cycling test at 750 Pa and a safety test at 2000 Pa.

E<sub>3</sub> indicates water leakage occurring between 300 and 499 Pa.

A<sub>3</sub> indicates an airflow rate below the line passing the point for a rate of flow of 2 m<sup>3</sup>h<sup>-1</sup>m<sup>-1</sup> at 100 Pa pressure, when tested up to a pressure of 600 Pa (see Figure 6).

Figure 6 Air permeability grade



## 4 Practicability of installation

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

4.2 In common with other types of doors and windows fitted to prepared openings, Anglian White Knight patio doors must be correctly positioned in relation to vertical damp-proof courses to prevent water penetration to the internal reveal.

4.3 Care is required 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 window area the approximate unobstructed area can be determined by deducting from the overall height and width the dimensions given in Table 4.

Table 4 Determination of unobstructed glass area

Feature	Deduction from overall height and width (mm)
Outer frame and door frame	133
Door threshold and bottom rail	149
Centre stile	104

## 6 Unobstructed opening area



When a patio door is fitted in an escape route, the unobstructed width and height can be calculated by deducting 185 mm from the sliding door leaf width and 266 mm from the overall height of the frame.

## 7 Natural ventilation area

7.1 The opening area for natural ventilation may be calculated by multiplying together the overall height and width dimensions reduced by the amount given in section 6.

7.2 The background ventilation requirements of the various building regulations can be met by the incorporation in the patio door of a suitably sized trickle ventilator. The ventilator is fitted to the head member of the inner door leaf. The weathertightness of particular ventilators has not been assessed.

## 8 Thermal transmittance and condensation risk

8.1 The thermal transmittance value (U value) of a fully reinforced patio door, 2070 mm high by 2070 mm wide incorporating two 1830 mm high by 876 mm wide Anglian Windows Ultra 4/16/4 mm sealed double-glazed units, when measured by the Guarded Hot Box Method according to BS 874 : Part 3 : Section 3.1 : 1987, is  $2.52 \pm 0.25 \text{ Wm}^{-2}\text{K}^{-1}$ .

8.2 The overall thermal insulation of the door will be dependent on the performance of the double-glazed units. It is recommended that a unit is specified that carries the BSI Kitemark to BS 5713 : 1979. Anglian Windows Ultra sealed double-glazed units carry the BSI Kitemark to BS 5713 : 1979, and are filled with a mixture of gases. In addition, further improvements in thermal performance can be achieved by the incorporation of coated glass.

8.3 For condensation to occur on any surface, the temperature of that surface must fall below the dew-point of the air adjacent to it. This will happen to the internal surface of the glazing before it happens to the internal surfaces of the frame. Therefore, if condensation occurs, it will form on the glass first. With air at 20°C and 65% RH next

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to the internal surfaces of the door tested in section 7.1, the external temperature must fall below 10°C for this to happen anywhere on the glass, below 7°C for it to happen anywhere on the frame, below -6°C before it happens to a majority of the frame surface and below -3°C before it happens to a majority of the glazing.

## 9 Safety

Patio doors are fitted with safety glass complying with BS 6206 : 1981 and therefore meet the safety recommendations given in BS 6262 : Part 4 : 1994.

## 10 Security against intrusion

10.1 Anglian White Knight patio doors are fitted with locking mechanisms and features as described in sections 1.11 and 1.12. They provide adequate security against unauthorised entry by the opportunist intruder, when judged against clauses 6.3.2 and 6.3.3 of BRE Occasional Paper (OP 57), December 1993, involving manipulation with small hand tools and forces applied with tools such as a 330 mm long nail bar or a 250 mm long screwdriver. Where relevant, reference should be made to NHBC Standards, Chapter 6.7.

10.2 Patio doors are fitted with internal glazing beads which cannot be removed from the outside.

10.3 Attention should be paid to packing of glazing units adjacent to all locking 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.

## 11 Resistance to impact

Patio doors will be unaffected by the soft body impacts likely to be encountered in dwellings or similar applications.

## 12 Ease of operation

The doors can be operated without difficulty when correctly installed.

## 13 Maintenance

13.1 The doors can be re-glazed and the gaskets and weatherstripping replaced, but these operations should be carried out by Anglian Windows Limited using the materials approved by the BBA. If the coextruded glazing bead gasket is damaged, for example during re-glazing, it may be necessary to replace the complete bead.

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

13.3 The PVC-U frame members can be cleaned using water containing household detergent, as instructed on the reverse of the Anglian warranty document. If dirt is allowed to build up on the members over long periods it may become more difficult to restore the surface appearance.

13.4 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 discolouration and damage to the surface. In addition, care must be taken to avoid damage to, or discolouration of, the members when stripping paint from adjacent timber, for example, by means of a blowlamp or paint stripper.

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

13.6 The 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.

## 14 Durability



14.1 Evidence is available on the performance in the UK of PVC-U similar to that used for the framing members over a period of 15 years in windows and in excess of 20 years in other external applications. Such evidence, when compared with the results of tests on the Anglian White Knight PVC-U, indicates that the doors will have a life of at least 25 years. Any slight colour change or surface dulling which might occur will be uniform over the visible surfaces of the door frames.

14.2 Fittings, including the rollers, locking mechanism and operating handles, as described in this Detail Sheet, will have similar durability except where doors 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 doors.

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

### 15 General

15.1 The patio doors must be fixed into the opening, in accordance with the recommendations in the Anglian *Technical Data Files* TDF No 044, by proprietary expanding anchors through the frame. Replacement doors should be fitted in accordance with BS 8213 : Part 4 : 1990, in particular with reference to clause 9.3.1.

15.2 Openings in new walls should be formed using a suitable template 10 mm wider and 5 mm higher than the patio door to be installed. The patio door should not be built in at the construction stage.

### 16 Procedure

16.1 After checking the dimensions of the doors, the outer frame is assembled, if necessary, and positioned in the opening. Holes are drilled through the outer frame and into the masonry to take fixing anchors. 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.

16.2 Installation of the fixed and sliding door leaves is undertaken as required using the technique fully described in the Anglian *Technical Data Files* TDF No 044.

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

The following is a summary of the technical investigations carried out on the Anglian White Knight PVC-U Sliding Patio Doors.

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

18.2 A cyclic operation test, involving repeated operation of a locking mechanism and lock cylinder, was carried out by the BBA. A total of over 30 000 operations was completed satisfactorily.

18.3 An examination of existing data and product design relating to resistance to intrusion was performed.

## Bibliography

BS 874 *Methods for determining thermal insulating properties*

Part 3 *Tests for thermal transmittance and conductance*

Section 3.1 : 1987 *Guarded hot-box method*

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

BS 6262 *Glazing for buildings*

Part 4 : 1994 *Safety related to human impact*

BS 6375 *Performance of windows*

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On behalf of the British Board of Agrément

Date of issue: 10th November 1999

Chief Executive

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