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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
99/3582
Product Sheet 1

HURST PLASTICS PVC-U INFILL DOOR PANELS

HURST PLASTICS PVC-U WHITE INFILL DOOR PANELS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to Hurst Plastics PVC-U White Infill Door Panels for use as alternatives to double-glazed units in PVC-U and aluminium doors.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Thermal insulation — the panels will contribute to limiting heat loss through a door (see section 5).

Condensation — the panels in normal domestic or similar applications do not constitute a significant condensation risk (see section 6).

Resistance to impact — the panels may be damaged by impact of hard objects (see section 7).

Resistance to thermal distortion — the panels will not suffer permanent distortion when exposed to summer conditions (see section 11).

Colourfastness — the colourfastness of the panels is satisfactory with a uniform discoloration of the skin material (see section 12).

Durability — the panels, when subjected to normal conditions of exposure and use, will have a life comparable to the door leaf into which they are fitted (see section 14).

The BBA has awarded this Agrément Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 6 November 2008
Originally certificated on 16 March 1999

Simon Wroe
Head of Approvals — Materials

Greg Cooper
Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, Hurst Plastics PVC-U White Infill Door Panels if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:

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

Requirement:	C2(c)	Resistance to moisture
Comment:		The products can meet this Requirement. See section 6 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The products will contribute to limiting heat loss through a door. See sections 5.1 and 5.2 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The products are acceptable. See section 14.1 and the *Installation* part of this Certificate.

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

Requirement:	B3(3)	Internal fire spread (structure)
Comment:		The products are not intended for use in doors where fire resistance requirements apply.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Fitness and durability of materials and workmanship
Comment:		The use of the products satisfy the requirements of this Regulation. See sections 13 and 14.1 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	3.15	Condensation
Comment:		The products can satisfy this Standard, with reference to clauses 3.15.1[1], 3.15.4[1] and 3.15.5[1]. See section 6 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The products will contribute to limiting heat loss through a door, with reference to clauses 6.1.6[1], 6.2.1[1][2], 6.2.7[1][2] to 6.2.9[1][2], 6.2.10[2], 6.2.11[1] and 6.2.12[2]. See sections 5.1 and 5.2 of this Certificate.
Regulation:	12	Building standards — conversions
Comment:		All comments given for the products under Regulation 9 also apply to this Regulation, with reference to clause 0.12[1][2] and Schedule 6[1][2].

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

Standard:	2.2	Separation
Comment:		The products are not intended for use in doors where fire resistance requirements apply, with reference to clauses 2.2.6[2] and 2.2.9[1].

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

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

Regulation:	B2	Fitness of materials and workmanship
Comment:		The products are acceptable. See section 14.1 and the *Installation* part of this Certificate.
Regulation:	B3(2)	Suitability of certain materials
Comment:		The products are acceptable. See section 13 of this Certificate.
Regulation:	C5	Condensation
Comment:		The products can satisfy this Regulation. See section 6 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3	Target carbon dioxide Emissions Rate
Comment:		The products will contribute to limiting heat loss though a door. See sections 5.1 and 5.2 of this Certificate.

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

Regulation:	E4(3)	Internal fire spread — Structure
Comment:		The products are not intended for use in doors where fire resistance requirements apply.

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: 1 *Description* (1.2).

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of Hurst Plastics PVC-U White Infill Door Panels, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter *6.7 Doors, windows and glazing*.

Zurich Building Guarantee Technical Manual 2007

In the opinion of the BBA, Hurst Plastics PVC-U White Infill Door Panels, when installed and used in accordance with this Certificate, satisfy the requirements of the *Zurich Building Guarantee Technical Manual*, Section *4 Superstructure*, Sub-section *External Walls — Doors windows and rooflights*.

General

This Certificate relates to Hurst Plastics PVC-U White Infill Door Panels for use as alternatives to double-glazed units in PVC-U and aluminium doors.

Technical Specification

1 Description

1.1 Hurst Plastics PVC-U White Infill Door Panels consist of a laminated sandwich construction comprising an inner and outer skin of PVC-U with a central core material. The central construction is given in Table 1. The insulation materials used in the centre core are either Styrofoam or EHD polystyrene bead board.

Table 1 Core constructions

Core type	Material	Thickness (mm)		
		20 mm panel	24 mm panel	28 mm panel
Insulation	Insulation	17	21	25
Steel/aluminium reinforcement	Insulation Steel/aluminium	7/10 0.5	10/10 0.5	10/15 0.5
MDF reinforced	Insulation MDF	7/7 4	7/10 4	7/15 4
Double MDF reinforced	Insulation MDF	– –	– –	5/5/7 4/4
Solid MDF	MDF	4/12	4/4/12	12/12
Solid MDF with steel insert	MDF Steel	4/12 0.5	4/4/12 0.5	12/12 0.5
Solid MDF with aluminium insert	MDF Aluminium	0.5	0.5	0.5
MDF/Styrofoam/MDF	MDF Styrofoam	4/4 10	4/4 12	4/4 10/7
Double steel	Insulation Steel	5/5/5 0.5/0.5	5/5/10 0.5/0.5	7/7/10 0.5/0.5
Simopor reinforced	Insulation Simopor	5/7[1] 6	7/7 6	10/10 6

– Not available.

(1) EHD polystyrene only.

1.2 Standard panels are flat (see Table 1) and a range of profiled panels is available, with and without integral glazing. The standard panel dimensions are shown in Table 2.

Table 2 Dimensions

Dimension (unit)	Quarter panel	Half panel	Full panel
Thickness (mm)	20, 24, 28	20, 24, 28	20, 24, 28
Width (mm)	420, 515, 525	800, 900	800, 900
Height (mm)	900	800, 900	1930, 2100

1.3 The range of whites, at the time of issue of the Certificate, consists of:

- Standard White
- Nova White
- Simona White 809
- Simona White
- Strand White
- C121 White
- Ultra White
- Opal White
- C154 White
- Sapphire White
- C152 White
- C160 White.
- Deeplas White
- Marshall Tufflex

1.4 A range of door knockers, letter plates, numerals and spyholes is available for use with the panels, these products are outside the scope of the Certificate. The door knockers and letter plates are available in finishes of:

door knockers

- lacquered brass
- black powder-coated brass
- silver anodised
- white.

letter plates

- gold anodised
- white
- black
- silver anodised.

1.5 The panels are manufactured by laminating skins onto the core material. Profiled skins are produced by vacuum-forming. Half and quarter panels are produced by cutting full panels to the required size.

1.6 Quality control checks are carried out on incoming raw material, during manufacture and on the final product. The final product is checked dimensionally and visually prior to packing.

2 Delivery and site handling

2.1 Hurst Plastics PVC-U White Infill Door Panels are delivered to the fabricator's factory packed in cardboard. The packing bears the manufacturer's name, panel thickness, colour, panel type and the BBA identification mark incorporating the number of this Certificate.

2.2 The panels should be stored in a dry and cool environment and never exposed to direct sunlight prior to removing the protective film.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Hurst Plastics White PVC-U Infill Door Panels.

Design Considerations

3 General

3.1 Hurst Plastics PVC-U White Infill Door Panels, when installed in accordance with this Certificate, are satisfactory for use as alternatives to double-glazed units in PVC-U and aluminium doors.

3.2 The door leaf must be of a suitable design for the panel to be installed and for the door to remain weathertight when in position.

4 Practicability of installation

4.1 Hurst Plastics PVC-U White Infill Door Panels and any glazing units in the panels must be fixed in accordance with the recommendations of the Certificate holder.

4.2 The panels are fitted into door leafs either at the fabricators' factory by experienced operators prior to delivery to site or in situ by experienced glazers.

5 Thermal insulation

5.1 The panel U values shown in Table 3 may be used in calculations of door U values, in accordance with BS EN ISO 10077-1 : 2006. The panel/door-frame interaction (ψ value) may be taken as zero. Indicative door U values are shown in Table 4.

5.2 The products may be used to contribute to a door meeting, or improving on, the following typical design U values:

England and Wales — Approved Documents L1A, L2A, L1B and L2B

- 2.2[1] to 3.3[2] $Wm^{-2}K^{-1}$

Scotland — Technical Handbook (Domestic) and Technical Handbook (Non-Domestic), Section 6.2

- 1.5 to 3.3[2] $Wm^{-2}K^{-1}$

Northern Ireland — Technical Booklets F1 and F2

- 2.2[1] to 3.3[2] $Wm^{-2}K^{-1}$.

(1) Mean for all openings.

(2) Maximum for an individual element.

6 Condensation

In normal domestic or similar applications, the products do not constitute a significant condensation risk.

7 Resistance to impact

7.1 Hard body impacts on the panel may cause localised damage and thus affect the appearance. Such damage is unlikely to lead to progressive deterioration of the panel but, if necessary, it may be replaced.

Table 3 U values for panels ($Wm^{-2}K^{-1}$)

Reinforcement type	Panel thickness (mm)		
	20	24	28
Insulation	1.52	1.30	1.13
Steel/aluminium reinforcing	1.52	1.35	1.13
MDF reinforcing	1.67	1.52	1.25
Double MDF reinforcing	n/a	n/a	1.42
Solid MDF (with and without steel/Al)	3.52	3.28	3.07
MDF/Styrofoam/MDF(1)	1.97	1.78	1.42
Double steel reinforcing	1.65	1.35	1.25
Simopor	1.70(2)	1.55	1.23

(1) Only available with Styrofoam insulation.
(2) Only available with EHD polystyrene insulation.

Table 4 Indicative U values for doors incorporating unreinforced panels ($Wm^{-2}K^{-1}$)

Door type	Panel thickness (mm)		
	20	24	28
Full panel(1)	1.7	1.5	1.3
Half glazed(2)	1.9	1.8	1.7

(1) For a 2 m by 1 m door, 80% panel and 20% door frame with a U_f of 2.2 $Wm^{-2}K^{-1}$.
(2) For a 2 m by 1 m door, 40% panel, 40% glazing with a U_g of 1.7 $Wm^{-2}K^{-1}$ and a ψ_g value of 0.08 $Wm^{-1}K^{-1}$.

7.2 Profiled panels are generally more susceptible to impact damage than plain panels, due to stresses caused by the vacuum-forming process.

7.3 Test data indicate that the panels will resist malicious impact; however, the overall security of the door to intrusion is dependent on the design of the door and beading.

8 Resistance to fire

The products are not intended for use in doors where fire resistance is a requirement.

9 Compatibility with doors

The panels are compatible with suitably designed PVC-U and aluminium doors, as alternatives to double-glazed units.

10 Weathertightness

The weathertightness of the door into which a panel is fitted is dependent on the method of fixing of the panel in the leaf of the door.

11 Resistance to thermal distortion

Test data indicate that the panels will not suffer permanent distortion when subjected to temperatures likely to be experienced in summer conditions.

12 Colourfastness

Tests were carried out for resistance to ultraviolet light ageing on the skin material used in the panels, and data confirm that the colourfastness of the panels is satisfactory with a uniform discoloration of the skin material. However, the PVC-U material used for the remainder of the outer frame and sash may not have the same ageing characteristics, and some colour difference may occur.

13 Maintenance

The panels can be cleaned using water containing household detergent. If dirt is allowed to build up on the panel over long periods discoloration and damage may occur and it may become difficult to restore the surface appearance.

14 Durability

14.1 The products, when subjected to normal conditions of exposure and use, will have a life comparable to the door leaf into which they are fitted.

14.2 Paints can adversely affect the impact strength of the panels. The application of dark colours could lead to the risk of thermal distortion. Therefore painting of the panels(1) is not recommended.

(1) This will also invalidate the manufacturer's warranty.

Installation

15 General

15.1 Hurst Plastics PVC-U White Infill Door Panels and any glazing units in the panels must be fixed in accordance with the recommendations of the Certificate holder.

15.2 The panels are fitted into new door leaves either at fabricators' factories prior to delivery to site or in situ. Replacement panels can be fitted on site to existing outer frames and sashes.

16 Procedure

16.1 Panels are cut to the fabricated door leaf dimensions using an suitable saw or router.

16.2 If a panel is not bedded on a gasket, silicone sealant is applied prior to installation around the rebate in the leaf. The panel is fitted using plastic packing pieces, if necessary, to achieve an even clearance on all sides. Plastic packers must be inserted between the panel and the door surround to ensure correct bracing, in accordance with the recommendations of the door system supplier.

16.3 The appropriate beading is applied to the internal door face around the rebate.

17 Repairs

In the event of damage the panels should be removed and replaced in accordance with the procedures given in sections 15 and 16. Where silicone bedding is used this will need to be cut away to remove the panel and care is required to avoid damage to the door leaf.

Technical Investigations

The following is a summary of the technical investigations carried out on Hurst Plastics PVC-U White Infill Door Panels.

18 Tests

18.1 Samples of the panels and the skin materials were obtained from the Certificate holder for testing. The results of the tests, which show typical values for the materials, are summarised in Tables 5 and 6.

Table 5 Characteristics of skin materials

Test (units)	Mean results		Method[1]
	Standard white	C152	
Tensile impact (kJm^{-2})			MOAT 8 : Appendix B
longitudinal	118	239	
transverse	134	495	
Water absorption (%)	0.08	0.13	BS 2782-4.430A
Tensile strength (Nmm^{-2})			BS 2782-3.321
longitudinal			(20 mm min^{-1})
unaged	55.4	—	
heat aged[2]	57.3	—	
UV aged[3]	61.7	—	
transverse			
unaged	51.7	—	
heat aged[2]	54.3	—	
UV aged[3]	55.0	—	
Elongation at yield (%)			BS 2782-3.321
longitudinal			(20 mm min^{-1})
unaged	2.7	—	
heat aged[2]	2.8	—	
UV aged[3]	2.9	—	
transverse			
unaged	2.5	—	
heat aged[2]	2.7	—	
UV aged[3]	2.6	—	

(1) The test documents are detailed in the *Bibliography*. Numbers/letters in the table refer to sections/parts of the various documents.
(2) Heat aged 56 days at 80°C.
(3) UV aged 1000 light hours at four light hours at 50°C/four hours condensation at 50°C.
— not tested.

18.2 Thermal shock testing was carried out on plain, profiled, steel reinforced and MDF panels.

18.3 Other tests carried out include:

- dimensions
- squareness
- ΔE colour change after UV ageing of skins
- dehydrochlorination of skins
- security impact on plain and steel reinforced panels
- Guarded hot-plate measurements on EHD
- polystyrene-cored panel.

19 Investigations

19.1 U value calculations were carried out and the risk of condensation evaluated. The manufacturing process was also examined, including the methods adopted for quality control, and details were obtained of the composition of the materials used.

19.2 The manufacturing process was examined, including the methods adopted for quality control, and details were obtained of the composition of the materials used.

19.3 A user survey was performed to examine the products performance in use.

Table 6 Service performance of panels

Test (units)	Mean results	Method[1]
Tensile bond strength (Nmm^{-2})		*ad-hoc*[2]
unaged	0.15	
heat aged[3]	0.16	
Hard body impact		MOAT 11 : 3.1.1.5
plain panel[4]		
750 mm	pass	
2 m	pass	
profiled panel[5]		
750 mm	pass	
2 m	pass	
Soft body impact[3]		MOAT 11 : 3.1.1.3
plain panel		
120 J	pass	
240 J	pass	
profiled panel[5]		
120 J	pass	
240 J	pass	

1) The test document is detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the document.
(2) Tensile bond strength — samples 100 mm x 25 mm, bonded to 100 mm x 100 mm steel plates. A test speed of 1 mm per minute was used on the tensile machine.
(3) Heat aged 56 days at 80°C.
(4) Styrofoam core.
(5) EHD polystyrene core.

Bibliography

BS 2782-3.321 : 1994 *Plastics. Determination of tensile properties. General principles*

BS 2782-4.430A to 430D : 1983 *Methods of testing plastics — Chemical properties — Determination of water absorption at 23°C — Determination of water absorption at 23°C with allowance for water-soluble matter — Determination of boiling water absorption — Determination of boiling water absorption with allowance for water-soluble matter*

BS EN ISO 10077-1 : 2006 *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Simplified method*

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

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

20 Conditions

20.1 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.

20.2 References in this Certificate to any Act of Parliament, Statutory Instrument, Directive or Regulation of the European Union, British, European or International Standard, Code of Practice, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

20.3 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.

20.4 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.

20.5 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.

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