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Agrément Certificate No 00/3772/C

Designated by Government to issue European Technical Approvals

FLOPLAST WHITE PVC-U CLADDING SYSTEM

Façade légère en PVC
Verkleidung

Product

- *THIS CERTIFICATE OF CONFIRMATION RELATES TO FLOPLAST WHITE PVC-U CLADDING.*
- *The cladding is supplied as white planks with a shiplap joint.*
- *The product has been assessed for use externally on buildings as a decorative and protective facing fixed horizontally on the following substrates:*

(a) timber stud walls with or without sheathing

(b) brick or block masonry walls.

continued

Regulations

1 The Building Regulations 2000 (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the requirements of the Building Regulations to which cladding systems can contribute in achieving compliance. In the opinion of the BBA, the FloPlast White PVC-U Cladding System, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement:	A1	Loading
Comment:		The product is acceptable for use as set out in sections 7.2 to 7.4 and 9.1 to 9.5 of this Certificate.
Requirement:	B4(1)	External fire spread — external walls
Comment:		The product has a fire propagation index (I) of 15.6 and its acceptability for use is as set out in sections 10.1 to 10.5 of this Certificate.
Requirement:	C4	Resistance to weather and ground moisture
Comment:		The product does not form a watertight or airtight facing. To achieve a waterproof barrier a breather membrane must be provided. See sections 11.1 to 11.4 of this Certificate.
Requirement:	L1	Conservation of fuel and power
Comment:		The insulation values of the planks and the cavity formed between the planks and the backing wall reduce the overall U value with reference to Tables 1 and 5 of Approved Document L1. See section 12 of this Certificate.

continued

continued

Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See section 14.1 of this Certificate.

2 The Building Standards (Scotland) Regulations 1990 (as amended)

In the opinion of the BBA, the FloPlast White PVC-U Cladding System, 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.

Regulation:	10	Fitness of materials
Standard:	B2.1	Selection and use of materials and components
Comment:		The product is acceptable. See section 14.1 of this Certificate.
Regulation:	11	Structure
Standard:	C2.1	Stability
Comment:		The product is acceptable for use as set out in sections 7.2 to 7.4 and 9.1 to 9.5 of this Certificate.
Regulation:	12	Structural fire precautions
Standard:	D4.1	Concealed spaces (cavities)
Standards:	D6.3 to D6.5	Distance of sides of buildings from boundaries: unprotected areas
Comment:		The product has a fire propagation index (I) of 15.6 and its acceptability for use is as set out in sections 10.1 to 10.5 of this Certificate.
Regulation:	17	Resistance to moisture
Standard:	G3.1	Resistance to precipitation
Comment:		The product does not form a watertight or airtight facing. To achieve a weatherproof barrier a breather membrane must be provided. See sections 11.1 to 11.4 of this Certificate.
Regulation:	18	Resistance to condensation
Standard:	G4.1	Interstitial condensation
Standard:	G4.2	Surface condensation
Comment:		Provided there is provision for adequate drainage and ventilation behind the cladding, and a breather membrane is incorporated, as required, the product will comply with these Standards. See sections 7.7 and 11.1 to 11.4 of this Certificate.
Regulation:	22	Conservation of fuel and power
Standard:	J2.1	Standards for buildings in purpose group 1
Standard:	J3.1	Standards for buildings in purpose groups 2 to 7
Comment:		The thermal resistance of the planks and the cavity formed between the planks and the backing wall will contribute to achieving the required U value. See section 12 of this Certificate.

3 The Building Regulations (Northern Ireland) 1994

In the opinion of the BBA, the FloPlast White PVC-U Cladding System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 14.1 of this Certificate.
Regulation:	C5	Resistance to ground moisture and weather
Comment:		The product does not form a watertight or airtight facing. To achieve a weatherproof barrier a breather membrane must be provided. See sections 11.1 to 11.4 of this Certificate.
Regulation:	D1	Stability
Comment:		The product is acceptable for use as set out in sections 7.2 to 7.4 and 9.1 to 9.5 of this Certificate.
Regulation:	E8	External fire spread
Comment:		The product has a fire propagation index (I) of 15.6 and its acceptability for use is as set out in sections 10.1 to 10.5 of this Certificate.
Regulation:	F2	Conservation of fuel and power. Building fabric
Comment:		The insulation values of the planks and the cavity formed between the planks and the backing wall reduce the overall U value. See section 12 of this Certificate.

4 Construction (Design and Management) Regulations 1994

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

See section: 8 *Practicability of installation* (8.1 and 8.2).

- *It is essential that the product is installed in accordance with the manufacturer's instructions and the* Design Data *and* Installation *sections of this Certificate.*

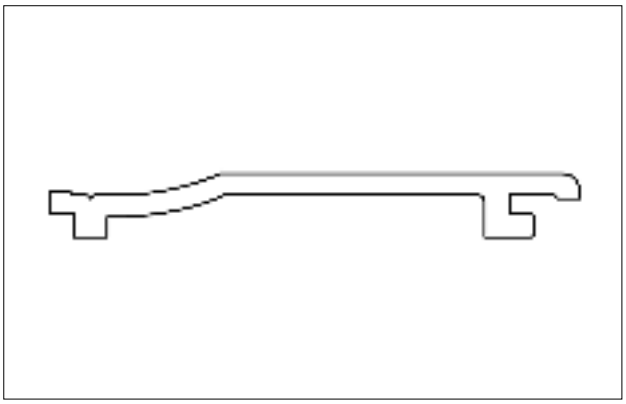
Confirmation of Irish Agrément Certificate No 94/0050 issued by the Irish Agrément Board (IAB) to Cork Plastics (Manufacturing).

5 Description

5.1 The FloPlast White PVC-U Cladding System is a protective and decorative facing for external use.

5.2 The system comprises white cladding planks with a shiplap joint (see Figure 1) and matching trims (see Figure 2).

Figure 1 Cladding plank profile



5.3 The planks are composed of a cellular PVC-UE core beneath an impact modified, outer weathering PVC-U skin. The trims consist of extrusions in impact modified PVC-U (see Figure 2).

5.4 The planks have the following characteristics:

standard length (m)	5
cover width (mm)	150
nominal thickness (mm)	7
minimum thickness of rigid outer surface (mm)	0.6

5.5 The planks are manufactured by co-extruding a high impact PVC-U compound, onto a foamable PVC-UE compound, using an inward foaming process, cooling, forming to section and finally cutting to length. Cellular PVC-UE is formed during the process by the evolution of gas from sodium bicarbonate present in the foamable PVC-UE compound.

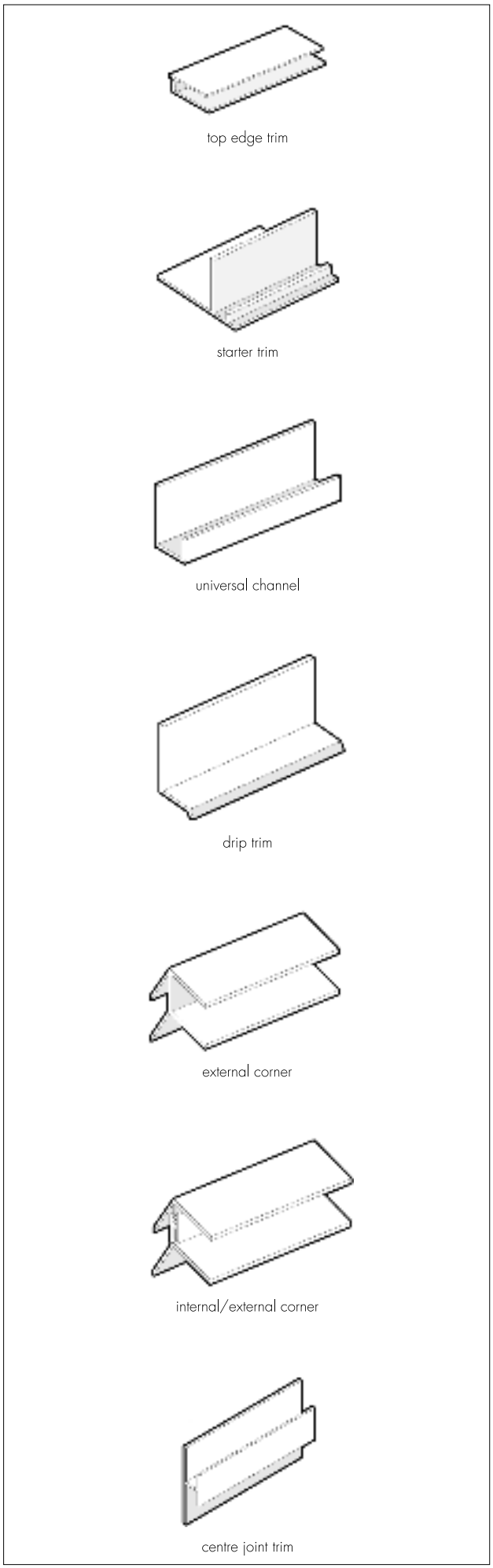
5.6 The trims are manufactured using conventional extrusion techniques.

5.7 Continuous quality control is exercised during manufacture, checks include dimensions, weight per metre, heat reversion, heat ageing and impact strength.

5.8 A4 (Steel No 1.4401, BS EN 10088-2 : 1995) stainless steel cladding pins (30 mm long by 2 mm shank diameter) are used to fix cladding planks to timber battens (secret fixing).

5.9 A4 stainless steel cladding pins (30 mm long by 2 mm shank diameter) are provided for fixing trims.

Figure 2 Extruded trims



6 Delivery and site handling

6.1 Components are supplied in protective polyethylene sleeve wrapping, quantities per pack being commensurate with component size.

6.2 All packaging bears the FloPlast product code and the BBA identification mark incorporating the number of this Certificate.

6.3 Unloading should be carried out by hand to avoid damage to the components, which should be stored flat, in their protective wrapping, on a clean, level surface. Stacks must not exceed one metre in height and should be restrained to prevent collapse. To avoid damage it is recommended that additional protection is provided when the planks are stored in the open.

Design Data

7 General

7.1 The FloPlast White PVC-U Cladding System is suitable for horizontal fixing, as a decorative and protective external facing over a timber stud, block or masonry walls above ground level.

7.2 The designer should ensure that the strength and integrity of the intended substrate is commensurate with that required of the cladding system (see sections 7.3 and 7.4).

7.3 Brickwork or blockwork walls should be constructed in the conventional manner in accordance with one of the following technical specifications:

(1) BS 5628-1 : 1992 and BS 5628-3 : 1985.

(2) The Building Regulations 2000 (England and Wales), Approved Document A1 / 2, Part C, Section 1.

(3) The Building Standards (Scotland) Regulations 1990 (as amended) Technical Standards, Part C *Small Buildings Guide*.

(4) The Building Regulations (Northern Ireland) 1994 (as amended), Technical Booklet D *Structure*.

7.4 Timber stud walls should be constructed in accordance with BS 5268-2 : 1996 and BS 5268-6.1 : 1996, and preservative treated in accordance with BS 5268-5 : 1989(1997). Studding and framing should be adequately supported by noggings to ensure rigidity.

7.5 When used over a sheathed timber stud frame or over a masonry or block substrate, the cladding should be fixed to preservative-treated, good quality timber battens (measuring not less than 25 mm by 38 mm) rigidly fixed to the studding (not unsupported sheathing) or masonry substrate at 600 mm centres or closer. Where a CCA (copper / chrome / arsenic) preservative is used, care should be taken to ensure that sufficient time is allowed for the complete fixation of the CCA preservative (approximately seven days) before the cladding is fixed.

7.6 Cellular PVC-U has a similar coefficient of thermal expansion to that of conventional rigid PVC-U. To avoid distortion in service, care should be taken not to install the cladding in extremes of temperature (ie below 5ºC or above 25ºC) and to allow adequate gaps for expansion (see sections 15.4, 16.11 and 16.15).

7.7 In accordance with BS 8200 : 1985, a continuous 10 mm ventilation pathway must be maintained behind the cladding, with minimum 5000 mm² ventilation slots per metre run at the top and bottom of the installation. This will also satisfy the NHBC requirements (see NHBC Standards, Chapter 6.2 : 1999) for a minimum 10 mm cavity behind cladding installed over timber sheathing. To comply with the requirements of Zurich Building Guarantees Technical Standards [Volume 2 Superstructure (page 60)] for cladding installed over timber sheathing, however, a minimum 19 mm cavity is required.

8 Practicability of installation

8.1 The cladding can be installed easily under normal site conditions provided the work is carried out according to the guidance given in sections 15 and 16 of this Certificate. Care should be taken when installing long lengths of cladding above ground-floor level.

8.2 The components of the system are easy to work using normal woodworking tools for cutting, drilling and shaping. Handsaws should have a fine-toothed blade. Hand-held and bench-mounted power tools with a carbide tipped blade should be run at speeds similar to, or higher than, those normally used for timber. When using power tools to cut or shape the product, it is recommended that both eye protection and a coarse-particle dust mask are used.

9 Strength and stability

Wind loading

9.1 Under wind loading the most likely mode of failure of the cladding will be by nail withdrawal under wind suction.

9.2 When installed in accordance with the requirements of this Certificate, onto battens at maximum 600 mm centres, the system can withstand dynamic wind pressures likely to be encountered in the United Kingdom.

9.3 Higher wind pressure may be accommodated by reducing batten spacing. This is particularly recommended at the corners of buildings and in exposed locations. In common with all cladding, the adequacy of a proposed installation should always be checked by a qualified engineer, who should include in the check the adequacy of the fixing of battens to the substrate, not covered by this Certificate.

9.4 The cladding should not be taken into account when designing a timber stud wall to resist racking forces.

Resistance to impact

9.5 The cladding is not recommended for use at ground-floor level where severe impacts may occur. It is suitable for use in locations above zones of impact from people as described in categories E and F of Table 2 of BS 8200 : 1985.

10 Behaviour in relation to fire

10.1 When tested to BS 476-6 : 1989 FloPlast co-extruded cellular PVC-U cladding material achieved a fire propagation index (I) of 15.6 with sub-indices (i_1), (i_2) and (i_3) of 7.1, 6.7 and 1.8, respectively.

10.2 When tested in accordance with BS 476-7 : 1987, the co-extruded material has achieved a Class D1 Y rating.

10.3 Although the spread of flame across the surface of PVC is limited, the material does tend to char and may fall away when exposed to fire. Due consideration should always be given to any combustible materials behind the cladding, which may become exposed in the event of fire. Where necessary, cavity barriers should be incorporated behind the cladding, as required by the relevant Building Regulations.

10.4 When determining the minimum distance between the sides of a building and the relevant boundary, any area of wall (with the appropriate fire resistance) covered by cellular PVC-U cladding is counted as an unprotected area amounting to half the actual area of the cladding.

10.5 Subject to the provisions given in section 9.4, the cladding is suitable for use on external walls other than those requiring a Class 0 external surface (eg external walls less than one metre from a relevant boundary).

11 Air and water penetration

11.1 The cladding is not air, water or water-vapour tight. When used on timber stud walls the product must be backed by a breather membrane acting as a vapour-permeable water barrier, incorporated behind the cladding under the supporting battens. This barrier must meet the requirements of BS 4016 : 1997 and have a vapour resistance less than 0.6 $MNsg^{-1}$ when calculated from the results of tests carried out at 25ºC and a relative humidity of 75%, in accordance with BS 3177 : 1959(1995).

11.2 Where the product is used as a decorative facing attached to weathertight masonry walls, a water barrier is not necessary as the amount of water that will penetrate the cladding will be small and will not have an adverse effect on the wall.

11.3 If the product is used in the renovation of a masonry wall which is structurally sound but not fully weathertight, the use of a vapour-permeable water barrier is advisable.

11.4 Provision must always be made to allow water that has penetrated behind the cladding to drain away.

12 Thermal insulation

An improvement in U value (thermal transmittance) of the external wall will be obtained by the use of the system, due in part to the cellular structure of the foam and in part to the air space between the cladding and the backing wall. It is not possible, however, to provide values for the improvement achievable due to the number of factors involved in any particular installation.

13 Maintenance

13.1 The cladding can be washed with water and detergent. Solvent-based cleaners should not be used.

13.2 Replacement of a damaged section can be carried out but may require the temporary removal of undamaged planks above the damaged area.

13.3 Paints can cause premature embrittlement of PVC-U products and the application of dark colours to PVC-U cladding could lead to risk of thermal distortion. Therefore, painting of the product is not recommended.

14 Durability

14.1 Accelerated weathering tests and limited natural exposure trials indicate that FloPlast co-extruded cellular PVC-U cladding is durable for at least 20 years and will retain adequate impact resistance over this period.

14.2 The product will retain its decorative function for a period of at least 20 years. Any slight colour change or surface dulling which might occur will be uniform over the visible surfaces of the cladding. However, staining will result from contact with creosote or bitumen.

Installation

15 General

15.1 Installation must be carried out in accordance with the manufacturer's instructions and the requirements of this Certificate.

15.2 Provision should be made for adequate drainage and ventilation behind the cladding.

15.3 Installation should not be carried out in extremes of temperature (between 5°C and 25°C is recommended).

15.4 Expansion gaps of 5 mm should be provided at the end of each plank.

16 Procedure

Preparation

16.1 Before installation commences the cladding operation should be thoroughly planned and prepared.

16.2 A final inspection of the substrate should be made to confirm that it is as prescribed in section 7.2 of this Certificate.

16.3 Appropriate cladding planks and trims should be selected and assembled (see Figures 1, 2 and 3).

16.4 The appropriate battens (selected and treated in accordance with section 7.5) should be fixed at centres not exceeding 600 mm. Additional batten sections are required at jointing positions (see section 16.16).

16.5 Vertical battens are required at the ends of each section, at the sides of windows and at joins between planks. Horizontal battens are not recommended at the top / bottom of either the installation or window / door openings, where they may restrict ventilation and drainage. Similarly, the use of horizontal trims at the base of the cladding must not reduce the ventilation opening below 5000 m^2 per metre run (see section 7.7).

16.6 On non-weatherproof substrates a vapour-permeable water barrier must be installed behind battens.

16.7 Windowheads and other protrusions should be protected by a suitable weatherproof membrane or flashing.

Installation (see Figure 3)

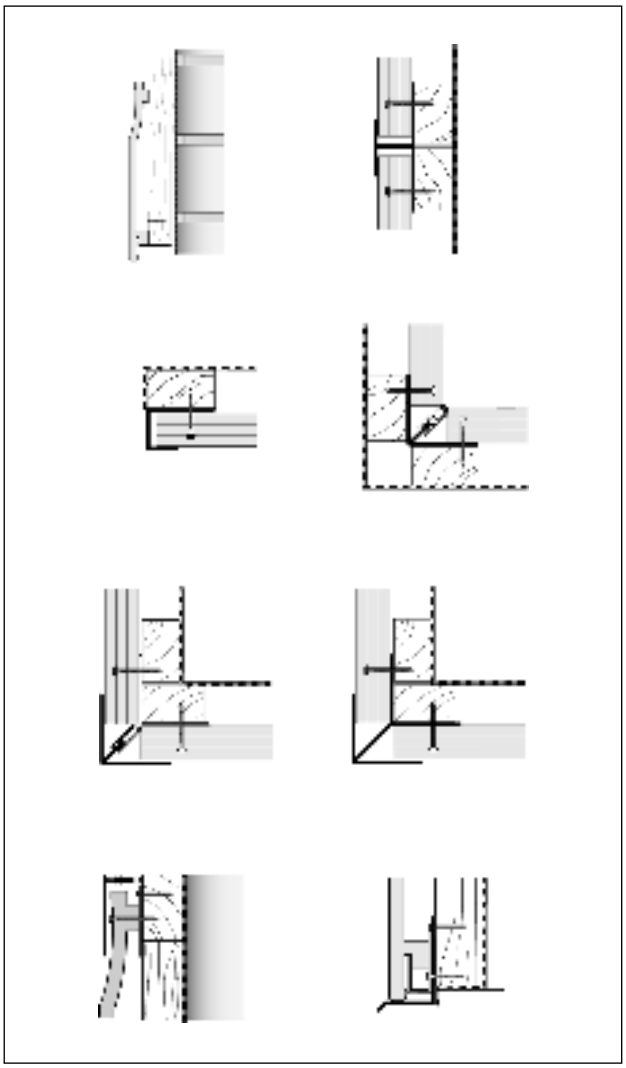
16.8 Working from a level line, a starter trim is fixed to the timber studs or battens. Care should be taken to ensure that the starter trim does not obstruct the opening required for drainage and ventilation at the base of the cladding.

16.9 All vertical trims, followed by top trims, are then fixed to perimeter battens (including battens around windows).

16.10 Where two-part trims are required, only the back half is fixed at this stage.

16.11 The bottom cladding plank is then located firmly in the starter trim and vertical trims, and fixed into place using the specified cladding nails, starting at one end or working from the centre outwards, nailing into each batten in turn. At the end of each plank a 5 mm gap should be allowed for expansion (ie 10 mm between boards).

Figure 3 Fixing details



16.12 Where necessary, trims and planks are cut to size and shape with a fine-toothed saw.

16.13 Subsequent planks are fitted into the preceding planks, ensuring that the shiplap joint is firmly closed, and nail heads are concealed by the overlap.

16.14 If necessary, the top plank is cut to fit the remaining space. Where this occurs, packing pieces taken from cladding offcuts should be placed behind the cut plank at each fixing centre.

16.15 Where sections longer than 5 m are to be clad, butt joints of adjacent cladding planks should be concealed by either a centre joint trim fixed to a batten or a butt joint trim, fitted to the planks above and below the joint. A 10 mm expansion gap should be allowed between the planks, both ends of which should be securely fixed to battens. Where butt joint trims are used, the joints should be staggered, with a continuous plank above and below the joint. The positioning of these trims should be taken into account during the planning stage.

16.16 Where two-part trims have been used, the installation is completed by fastening the front part of the trim.

Technical Investigations

The following is a summary of the technical investigations carried out on the FloPlast White PVC-U Cladding System.

17 Tests

An assessment was made of the test data leading to the issue of the Irish Agrément Certificate for the product relating to:

Vicat softening point
weight per linear metre
ash content
impact resistance
impact resistance at –10°C
voidage
density
flexural strength
dimensional stability
resistance to splitting and delamination (acetone)
nail pull-through
natural weathering
accelerated weathering
colour stability
stress relief (heating)
water absorption
surface spread of flame
fire propagation
resistance to wind action.

18 Other investigations

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

18.2 The practicability of installation of FloPlast cladding was assessed.

18.3 The ease of cleaning and of damaged profile replacement was assessed.

Bibliography

BS 476 *Fire tests on building materials and structures*
BS 476-6 : 1989 *Method of test for fire propagation for products*
BS 476-7 : 1987 *Method for classification of the surface spread of flame of products*

BS 3177 : 1959(1995) *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

BS 4016 : 1997 *Specification for flexible building membranes (breather type)*

BS 5268 *Structural use of timber*
BS 5268-2 : 1996 *Code of practice for permissible stress design, materials and workmanship*
BS 5268-5 : 1989(1997) *Code of practice for the preservative treatment of structural timber*
BS 5268-6 *Code of practice for timber frame walls*
BS 5268-6.1 : 1996 *Dwellings not exceeding four storeys*

BS 5628 *Code of practice for use of masonry*
BS 5628-1 : 1992 *Structural use of unreinforced masonry*
BS 5628-3 : 1985 *Materials and components, design and workmanship*

BS 8200 : 1985 *Code of practice for design of non-loadbearing external vertical enclosures of buildings*

BS EN 10088 *Stainless steels*
BS EN 10088-2 : 1995 *Technical delivery conditions for sheet / plate and strip for general purposes*

BS EN ISO 9002 : 1994 *Quality systems. Model for quality assurance in production, installation and servicing*

Conditions of Certification

19 Conditions

19.1 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.

19.2 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.

19.3 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) remain covered by a valid Irish Agrément; and

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

19.4 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

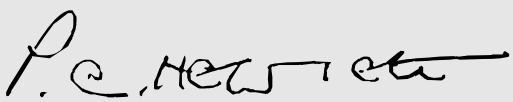
(c) the nature of individual installations of the product, including methods and workmanship.

19.5 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.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

In the opinion of the British Board of Agrément, the FloPlast White PVC-U Cladding System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 00/3772/C is accordingly awarded to FloPlast Limited.

On behalf of the British Board of Agrément



Date of issue: 19th March 2001

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