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**Agrement
Certificate
No 97/3316**
Second issue***BBA** **BRITISH
BOARD OF
AGREMENT**
TECHNICAL APPROVALS FOR CONSTRUCTIONDesignated by Government
to issue
European Technical
Approvals**DOLLKEN STONECHIP CLADDING**

Façade légère

Verkleidung

Product

• THIS CERTIFICATE RELATES TO DOLLKEN STONECHIP CLADDING.

• The cladding is supplied in interlocking planks, comprising a cellular PVC-U base profile in the exposed surface of which are embedded small stone chips.

• The product has been assessed for use externally on buildings as a decorative and protective facing fixed vertically onto timber battens on the following substrates:

(a) timber stud walls with or without sheathing

(b) brick or block masonry walls.

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

The Secretary of State has agreed with the British Board of Agrément the requirements of the Building Regulations to which cladding systems can contribute in achieving compliance. In the opinion of the BBA, Dollken Stonechip Cladding, 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 9.3 of this Certificate.

Requirement: B4(1)

External fire spread

Comment:

The cladding meets the Class 0 product performance classification and its acceptability for use is as set out in sections 10.1 to 10.5 of this Certificate.

Requirement: C2(b)(c)

Resistance to 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(a)(i)

Dwellings

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

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• 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.

Requirement:	L2(a)	Buildings other than dwellings
Comment:		The insulation values of 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.
Requirement:	Regulation 7	Materials and workmanship
Comment:		The product is acceptable. See sections 14.1 to 14.3 of this Certificate.

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



In the opinion of the BBA, Dollken Stonechip Cladding, 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 and workmanship
Standard:	B2.1	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product can contribute to a construction meeting this Standard. See the <i>Installation</i> section of this Certificate.
Standard:	B2.2	Selection and use of materials, fittings, and components, and workmanship
Comment:		The product is an acceptable material. See sections 14.1 to 14.3 of this Certificate.
Regulation:	11	Structure
Standard:	C2.1	Structure — Stability
Comment:		The product is acceptable for use as set out in sections 7.2 to 7.4 and 9.1 to 9.3 of this Certificate.
Regulation:	12	Structural fire precautions
Standard:	D2.3	Structural protection — Non-combustible materials
Standard:	D6.2	Concealed spaces — Principles
Standard:	D8.1	Fire spread to adjoining buildings — Principles
Standard:	D8.2	Fire spread to adjoining buildings — Non-combustible materials
Standard:	D10.1	Fire spread on an external wall
Comment:		The cladding meets the Class 0 product performance classification 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 — 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	Condensation — Interstitial condensation
Standard:	G4.2	Condensation — 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:	J3.1	Buildings in purpose group 1 — Building fabric
Standard:	J3.2	Buildings in purpose group 1 — Elemental Method
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) 2000



In the opinion of the BBA, Dollken Stonechip Cladding, 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 sections 14.1 to 14.3 of this Certificate.
Regulation:	C4	Resistance to ground moisture and weather
Regulation:	C5	Condensation
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 9.3 of this Certificate.

Regulation: E5

External fire spread

Comment:

The cladding meets the Class 0 product performance classification and its acceptability for use is as set out in sections 10.1 to 10.5 of this Certificate.

Regulation: F2

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 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

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

See section:

6 *Delivery and site handling* (6.3) and 8 *Practicability of installation* (8.1 and 8.2).

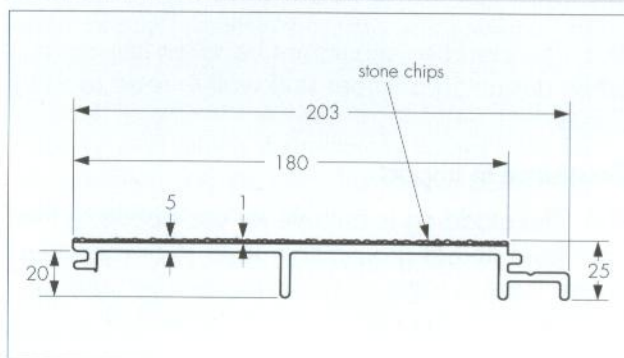
Technical Specification

5 Description

5.1 Dollken Stonechip Cladding is a protective and decorative facing for external use.

5.2 The product is available in the form of 6 metre long interlocking cladding planks, weighing approximately 7 kg, with the cross-sectional dimensions shown in Figure 1.

Figure 1 Dollken Stonechip Cladding planks (all dimensions in mm)



5.3 The cladding planks comprise a cellular PVC-U base profile in the exposed surface of which are embedded small stone chips (size approximately 2.5 mm).

5.4 The product is available in nine colour variations:

- umbria
- terra
- ravenna
- kristall
- sizilia
- montana
- nevada

- blanca
- azura.

5.5 The planks are manufactured by embedding stone chips into the surface of PVC-U during the extrusion of the cladding profile. The extruded product is cooled and cut to length. Cellular PVC-U (PVC-UE) is formed during the extrusion process by the evolution of gas from a foaming agent.

5.6 The stone chips are controlled for size, colour, water absorption and chemical composition.

5.7 Continuous quality control is exercised during manufacture: checks include appearance, colour, dimensions, weight per metre and impact strength.

5.8 Stainless steel screws (30 mm length by 3 mm shank diameter) are used to fix cladding planks to timber battens (secret fixing). White painted, stainless steel, annular ring-shank nails (37 mm length by 2 mm diameter) are available for use where the trim is exposed (eg edge detail).

5.9 Rigid PVC-U trims are available for use with the cladding, but are outside the scope of this Certificate.

6 Delivery and site handling

6.1 The planks are delivered to site in perforated polythene sleeves with six 6-metre lengths per pack.


6.2 All packaging bears product details and batch number together with the BBA identification mark incorporating the number of this Certificate.

6.3 Packs should be stored flat, in their protective wrapping, on a clean, level surface. Stacks must not exceed 2.1 metres in height (equivalent to four pallets) 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 Dollken Stonechip Cladding is suitable for vertical fixing, as a decorative and protective external facing over a timber stud or masonry wall.

 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:

- BS 5628-1 : 1992 and BS 5628-3 : 2001
- Section 3, Part C of Approved Document A1/2 to the Building Regulations 2000 (as amended) (England and Wales)
- *The Small Buildings Guide*, for compliance with Part C of the Technical Standard for compliance with the Building Standards (Scotland) Regulations 1990 (as amended)
- Technical Booklet D, *Structure*, to the Building Regulations (Northern Ireland) 2000.

7.4 Timber stud walls should be constructed in accordance with BS 5268-2 : 2002 and BS 5268-6.1 : 1996, and preservative treated in accordance with BS 5268-5 : 1989. 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 substrate, the cladding should be fixed to preservative-treated, good quality timber battens (measuring not less than 30 mm by 50 mm, rigidly fixed to the 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 (see section 15.9) and to allow adequate gaps for expansion equivalent to 10 mm per 6-metre length.

 7.7 The cladding must be installed to provide a minimum ventilated air space of 19 mm between the cladding and the backing wall. This satisfies the NHBC requirement (see NHBC Standards, Chapter 6.2 : 2002) for a minimum 10 mm wide ventilated cavity, and the Zurich Building Guarantees requirement (Clause 6.9.2.3 Zurich Municipal Technical Manual) for a minimum 19 mm cavity to be maintained between claddings and sheathing. The 20 mm rear leg on the

cladding planks will enable this requirement to be met, provided this ventilation space does not become blocked, for example by insulation.


8 Practicability of installation

8.1 Dollken Stonechip 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.

8.2 The components of the system are easy to work using normal woodworking tools for cutting, drilling, grinding 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.

9 Strength and stability

Wind loading

 9.1 When installed in accordance with the requirements of this Certificate, onto battens at 600 mm spacings, Dollken Stonechip Cladding can withstand dynamic wind pressures up to 2500 Pa.


9.2 The rigidity of the cladding may be increased by reducing batten spacing. This may be appropriate at the corner 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.

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

Resistance to impact

9.4 The cladding is suitable for use above ground-floor level and at ground-floor level in private areas where there is some incentive to exercise care, as covered by categories C to F of Table 2 of BS 8200 : 1985.

10 Behaviour in relation to fire

 10.1 When tested to BS 476-6 : 1989 the cladding material achieved a fire propagation index (I) of 6.9 with sub-indices (i_1), (i_2) and (i_3) of 1.1, 3.9 and 1.9, respectively.


10.2 When tested in accordance with BS 476-7 : 1997, the product achieved a Class 1Y surface spread of flame rating.

10.3 On the evidence of the tests reported in 9.1 and 9.2, and an indicative surface spread of flame test on the reverse (PVC-U) surface of the planks, Dollken Stonechip Cladding is assessed as meeting the Class 0 requirements of the Building Regulations.

10.4 Although the spread of flame across the surface of the product is limited, PVC tends 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. Any insulation material should be non-combustible or of limited combustibility. Where necessary, cavity barriers should be incorporated behind the cladding as required under the relevant Building Regulations.

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

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 25°C and a relative humidity of 75%, in accordance with BS 3177 : 1959.

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 below 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.


13 Maintenance

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

13.2 Damaged planks may be replaced following the procedure specified by the manufacturer.

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 site evidence of similar cladding up to 10 years old indicate a life expectancy of 30 years.

14.2 There may be some small loss of stone chips from the surface, but this will not significantly affect the overall appearance of the cladding.

14.3 The planks will retain atmospheric dirt in the same manner as other aggregate finishes.

Installation

15 General

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

15.2 The job should be thoroughly planned and all preparations made before installation commences.

15.3 Appropriate planks, trims and fixings should be selected and assembled ready for use. Care should be taken to ensure that planks to be used on any one face are from the same batch, to ensure a good colour match.

15.4 Battens should be selected and treated in accordance with section 7.5.

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

15.6 On non-weatherproof substrates a vapour permeable water membrane (breather membrane) must be installed behind the battens.

15.7 Window heads and other protrusions should be protected by a suitable weatherproof membrane or flashing.

15.8 Provision must be made for adequate drainage and ventilation behind the cladding (see section 7.7).

15.9 Cladding should not be installed at temperature extremes, between 5°C and 25°C is recommended.

16 Procedure

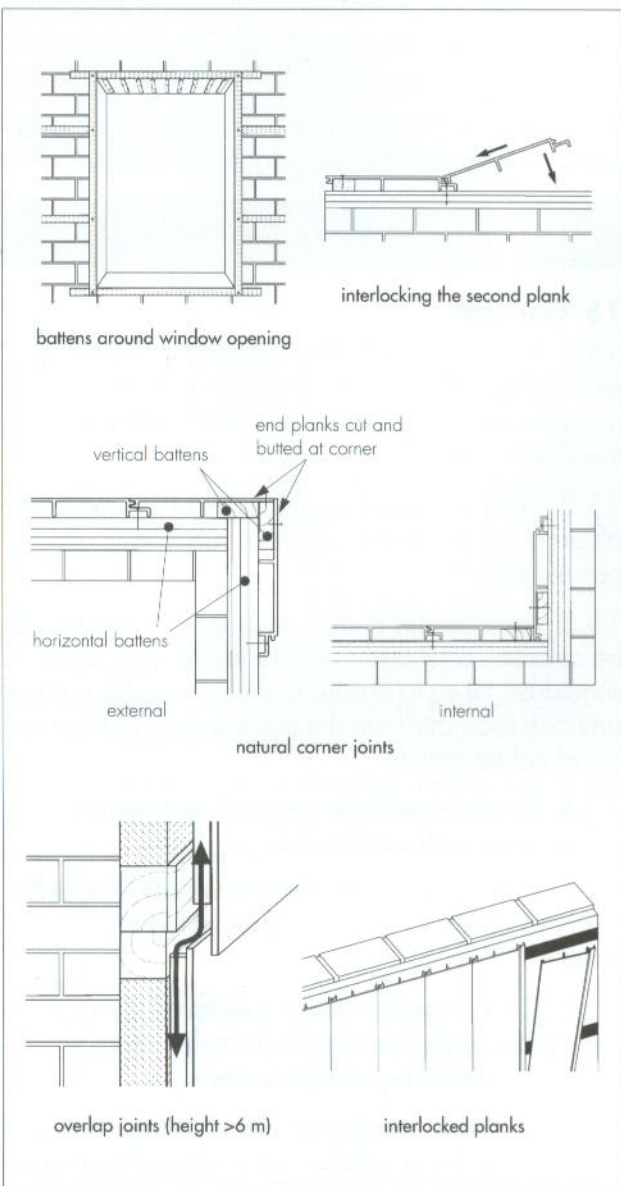
Preparation

16.1 Timber battens measuring a minimum of 30 mm by 50 mm are fixed horizontally above and below window openings and at maximum 600 mm centres over the area to be clad.

16.2 Where appropriate, top/bottom trims are fixed to outermost battens ensuring that ventilation pathways will remain clear when the cladding planks are installed.

16.3 Timber battens (20 mm by 40 mm) are fixed vertically to the horizontal battens of the sides of the installation and at the sides of window/door openings (see Figure 2).

Figure 2 Installation details



16.4 Where appropriate, corner trims are fixed to the vertical battens.

16.5 The first plank is cut to width by removing the grooved end. This is achieved by scoring down the back of the planks with a sharp knife, snapping off the unwanted length, and grinding the edge to a smooth finish.

16.6 The cut end of the plank is fixed vertically to the vertical batten at approximately 100 mm centres using the specified white painted nails, whilst the other end is screwed to the horizontal batten through one of the indented nailing positions on the tongued leg.

16.7 Subsequent planks are interlocked into the preceding plank and in turn screwed to the horizontal battens (see Figure 2).

16.8 The final plank is cut to width and nailed to the vertical batten as described for the first plank in section 15.5.

16.9 Trims are available for use at the corners of installations. Alternatively, planks can be butted against each other forming a 'natural' joint (see Figure 2).

16.10 Trims are also available for completing the installation at window/door openings.

16.11 For installations over 6 metres, lengths of cladding may be overlapped. For this purpose approximately 30 mm is removed from the rear legs at the bottom of the higher planks, which are fixed to a raised lower horizontal batten so that they are clear of the lower planks and overlap them by about 10 mm (see Figure 2). This permits ventilation to be maintained behind the cladding and allows a minimum 10 mm for expansion along the length of the planks. Alternatively, a trim may be used at this junction.

Technical Investigations

The following is a summary of the technical investigations carried out on Dollken Stonechip Cladding.

17 Tests

Tests were carried out on planks to determine:

- density
- ash content
- Izod impact strength (ISO 180 : 1982)
- hard and soft body impact resistance (cladding panel)
- dimensional stability
- freeze/thaw resistance
- colour stability
- behaviour under thermal shock
- Izod impact strength and appearance after heat ageing
- simulated wind load test
- nail pull-through.

18 Investigations

18.1 Calculations were undertaken to evaluate performance under wind load.

18.2 The dimensions of cladding planks were checked.

18.3 An examination was made of data relating to:

- behaviour of the cladding in fire
- colour stability
- water absorption of stone chips.

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

18.5 The practicability of installation was assessed.

Bibliography

BS 476-6 : 1989 *Fire tests on building materials and structures — Method of test for fire propagation for products*

BS 476-7 : 1997 *Fire tests on building materials and structures — Method for classification of the surface spread of flame of products*

BS 3177 : 1959 *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 5268-2 : 2002 *Structural use of timber — Code of practice for permissible stress design, materials and workmanship*

BS 5268-5 : 1989 *Structural use of timber — Code of practice for the preservative treatment of structural timber*

BS 5268-6.1 : 1996 *Structural use of timber — Code of practice for timber frame walls — Dwellings not exceeding four storeys*

BS 5628-1 : 1992 *Code of practice for use of masonry — Structural use of unreinforced masonry*

BS 5628-3 : 2001 *Code of practice for use of masonry — Materials and components, design and workmanship*

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

ISO 180 : 1982 *Plastics — Determination of Izod impact strength*

