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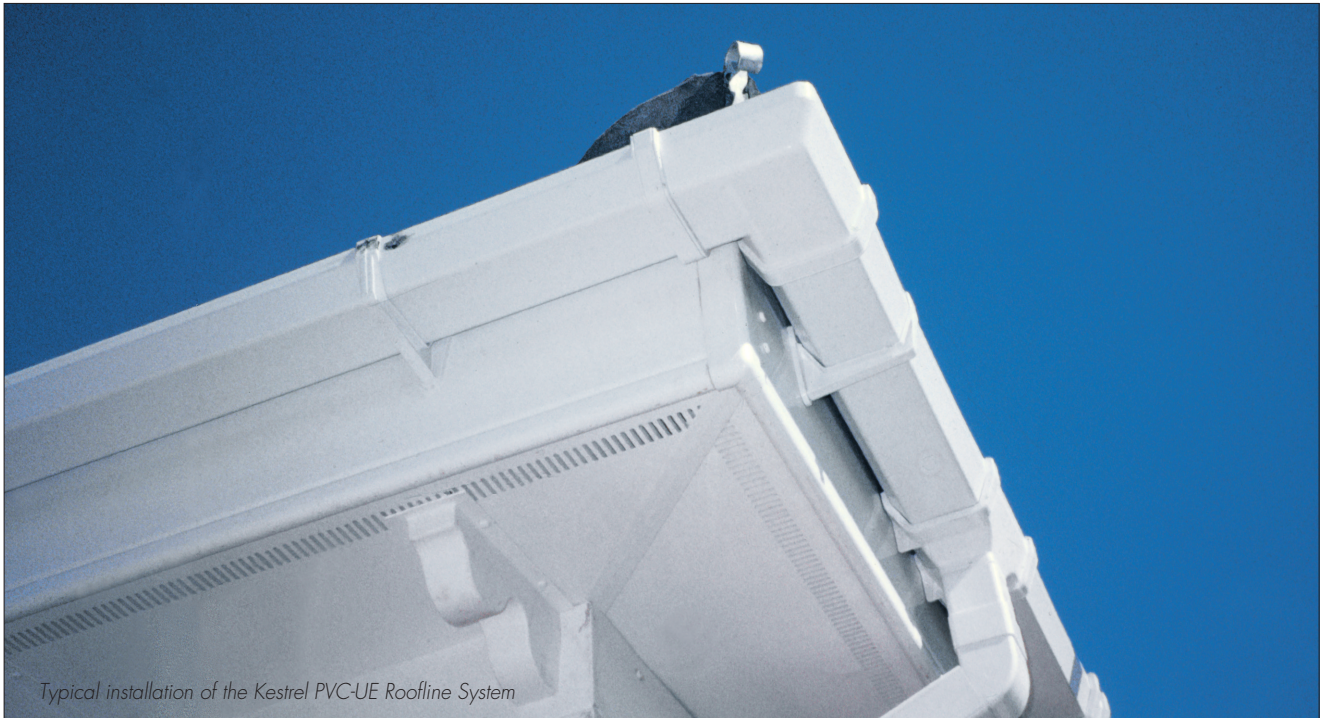
**Agrément
Certificate
No 95/3117**
*Third issue **

Designated by Government
to issue
European Technical
Approvals

KESTREL PVC-UE ROOFLINE SYSTEM

Accessoires en PVC-U pour toits
Zubehör (von PVC-U) für Dächer

Product



Typical installation of the Kestrel PVC-UE Roofline System

• THIS CERTIFICATE RELATES TO THE KESTREL PVC-UE ROOFLINE SYSTEM, COMPRISING FASCIA, SOFFIT AND BARGE BOARDS, SOFFIT VENTILATORS, AND ACCESSORIES.

• The system is for external use on roofs as a substitute for timber or other conventional materials.

• It is essential that the system is installed in accordance with the manufacturer's instructions and the Design Data and Installation parts of this Certificate.

Regulations

1 The Building Regulations 1991 (as amended 1994) (England and Wales)



In the opinion of the BBA, there are no requirements under these Regulations relating to the components of the system except for soffit ventilators. The Secretary of State has agreed with the British Board of Agrément the requirements of the Building Regulations to which roof space ventilation components can contribute in achieving compliance. In the opinion of the BBA, the soffit ventilators which form part of the Kestrel PVC-UE Roofline System, if used in accordance with the provisions of this Certificate, will contribute to meeting the relevant requirements.

Requirement: F2

Comment:

Condensation in roofs

When used in accordance with this Certificate, Kestrel soffit ventilators can contribute in enabling a roof to meet this Requirement. See sections 7.4 to 7.14 of this Certificate.

Requirement: Regulations 7

Comment:

Materials and workmanship

Kestrel soffit ventilators are acceptable. See section 12 of this Certificate.

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



In the opinion of the BBA, the Kestrel PVC-UE Roofline System, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and Technical Standards as listed below.

Regulation:	10	Fitness of materials
Standard:	B2.1	Selection and use of materials and components
Comment:		The components of the system are acceptable.
Regulations:	17 and 18	Preparation of sites and resistance to moisture
Standard:	G3.1	Resistance to condensation
Comment:		The product will provide adequate protection against the penetration of moisture to the inner surface of the building on which it is installed. See section 7.1 of this Certificate.
Standard:	G4.1	Interstitial condensation
Comment:		Kestrel soffit ventilators can contribute towards enabling a roof to meet this Standard. See sections 7.4 to 7.14 of this Certificate.

3 The Building Regulations (Northern Ireland) 1994 (as amended 1995 and 1997)



In the opinion of the BBA, there are no requirements under these Regulations relating to the components of the system except for soffit ventilators. In the opinion of the BBA, Kestrel soffit ventilators, if used in accordance with the provisions of this Certificate, will satisfy the various Building Regulations as listed below.

Regulation:	B2	Fitness of materials and workmanship
Comment:		Kestrel soffit ventilators are acceptable. See section 12 of this Certificate.
Regulation:	C7	Condensation
Comment:		Kestrel soffit ventilators can contribute towards enabling a roof to meet this Regulation. See sections 7.4 to 7.14 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: 13 *Installation* (13.7).

Technical Specification

5 Description

5.1 The Kestrel PVC-UE Roofline System is for external use on roofs as a substitute for timber or other conventional materials.

5.2 The system comprises a range of PVC-UE (cellular PVC-U) boards including vented soffits (see Figure 1) together with ancillary components including ventilator and other extruded trims, and injection moulded joints (see Figure 2).

5.3 The soffit ventilators, which include the vented cellular boards and ventilator trims, provide a means of ventilating the roof void.

5.4 The products are available in three shades of white: standard, dove and brilliant.

5.5 The PVC-UE boards comprise a closed cell cellular PVC-U core beneath an outer weathering impact modified PVC-U skin. The D-section trim is of

the same coextruded cellular construction as the cellular boards. The soffit ventilator and other extruded trims are composed of impact modified PVC-U and the injection mouldings of PVC-U.

5.6 The boards are available in 9 mm, 16 mm and 22 mm thickness, in a range of widths from 100 mm to 405 mm, in standard 5 m lengths of average density 550 kgm⁻³ and with a nominal skin thickness of 0.5 mm.

5.7 The PVC-UE boards and D-section trim are manufactured by coextruding a high impact PVC-U compound onto a foamable PVC-U compound, cooling and forming to section. Cellular PVC-U is formed during the process by the evolution of gas from sodium bicarbonate present in the foamable PVC-U compound. A transparent polythene film, colour coded to denote the shade of white, is applied to the outer face of the extrusion before the board is cut to length.

5.8 The trims are manufactured using conventional extrusion and injection moulding techniques.

5.9 Continuous quality control is undertaken during the manufacture of cellular boards to include checks on appearance, colour, dimensions, weight per metre and impact strength, and on rigid trims to include checks on heat reversion, heat ageing and stress relief.

Figure 1 Cellular boards

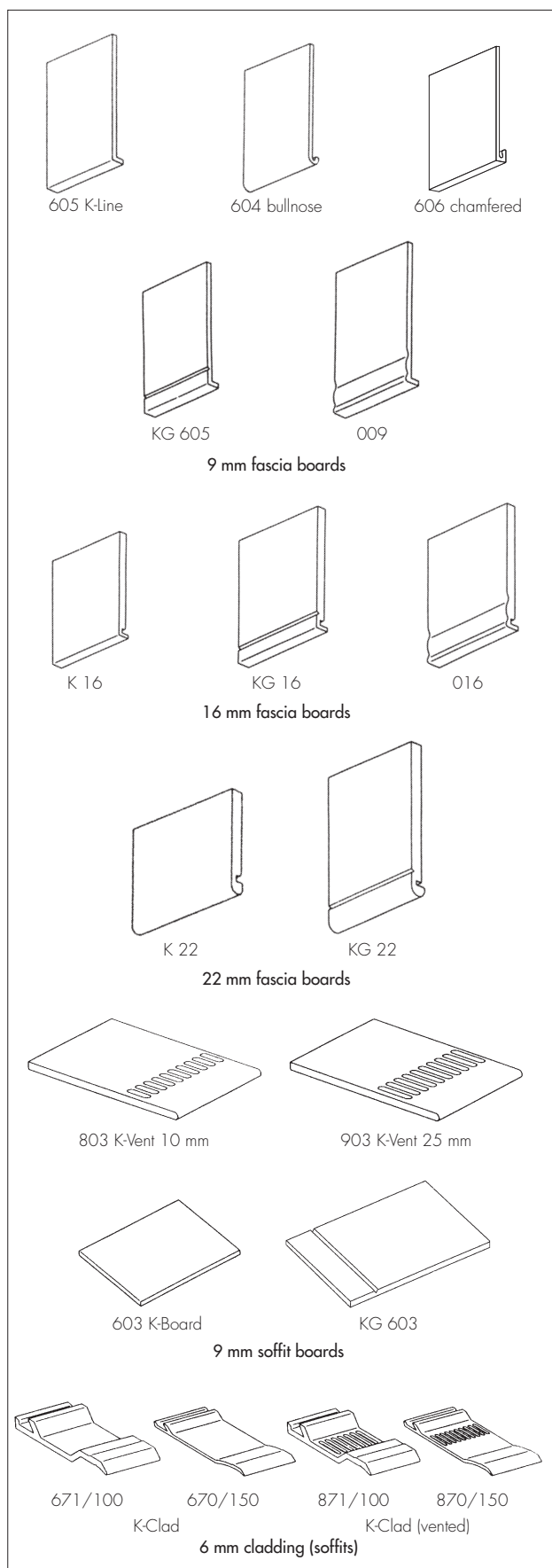
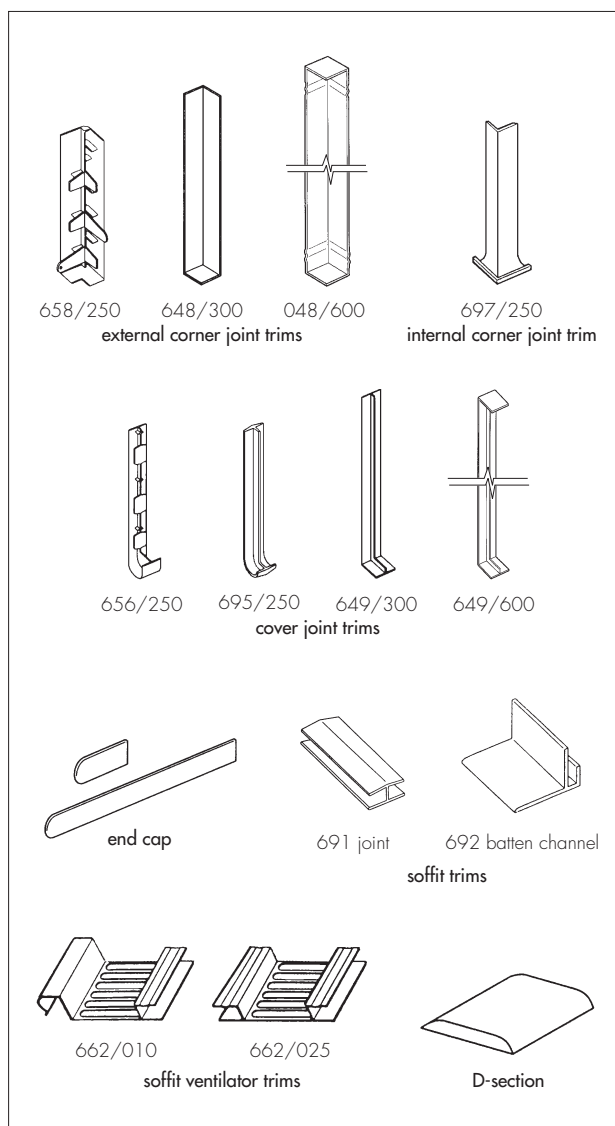


Figure 2 Selection of typical components



5.10 Plastic headed, 40 mm long, 4 mm shank diameter, austenitic stainless steel (grade A4, BS 6105) screws or 50 mm long, 2.5 mm shank diameter, annular ring shank austenitic stainless steel nails are used for fixing 9 mm fascia and soffit boards. Plastic headed, 50 mm long, 4 mm shank diameter, austenitic stainless steel screws, or 65 mm, 3.35 mm shank diameter, annular ring shank, austenitic stainless steel nails are used for fixing the 16 mm and 22 mm fascia boards. 30 mm long, 2.0 mm shank diameter, annular ring shank, austenitic stainless steel nails are used for fixing the cladding soffits and the fascia corner and cover joints. 30 mm long, 4 mm diameter, austenitic stainless steel screws, available from the manufacturer, are used for fixing gutter brackets to the 16 mm and 22 mm fascia boards.

5.11 A low modulus silicone sealant/adhesive, available from the manufacturer, is used for fixing trims.

6 Delivery and site handling

6.1 The Kestrel fascia, barge board, soffit and trim profiles are delivered to site in packs sealed in

polythene sleeves bearing the Kestrel product marking and the BBA identification mark incorporating the number of this Certificate. Pack quantities vary dependent upon the type of profile.

6.2 The packs should be unloaded by hand, stored on a clean, level surface in stacks not exceeding one metre in height and restrained from collapse. If stored externally, the packs should be kept under cover.

Design Data

7 General



7.1 The Kestrel PVC-UE Roofline System is suitable for use externally to provide a protective and decorative trim to roofs where timber or other conventional materials would normally be used.

7.2 The system must be fixed only to structurally sound building substrates, at centres not exceeding 600 mm. Rafter feet and gable ladders should be adequately supported by noggings to ensure rigidity. Replacement, rather than over fixing, of existing fascia, is recommended. Timber roof structures, to which the system is fixed, must be designed and/or constructed in accordance with the relevant Building Regulations and, as appropriate, in compliance with one of the following technical specifications:

BS 5268 : Part 2 : 1996

BS 5268 : Part 3 : 1985

The Building Regulations 1991 (as amended 1994) (England and Wales), Approved Document A1/2, Section 1B.

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

7.3 Kestrel PVC-UE components have a similar coefficient of thermal expansion to that of conventional solid PVC-U. A 5 mm to 6 mm gap should be provided at the end of each board, at the joint trim (ie 10 mm to 12 mm between boards), to allow for movement. Care should be taken not to install the system in extremes of temperature. The recommended temperature for installation is between 5°C and 25°C.

Ventilation



7.4 Kestrel soffit ventilators can contribute towards providing the necessary roof space ventilation. Guidance on the provision of adequate ventilation is given in the 1995 edition of the Approved Document F2 *Condensation in roofs*, to the Building Regulations 1991 (as amended 1994) (England and Wales), and in BS 5250 : 1989(1995).

7.5 When providing roof space ventilation it is essential that the airway should not be allowed to become blocked by the loft insulation. This may be achieved by the use of a suitable BBA approved insulation retainer producing an air passage with an

effective area (geometric free area) at least equal to that of the soffit ventilator used.

7.6 The soffit ventilator trims have effective areas of about 22 000 mm² per metre run (which is equivalent to a continuous slot of about 22 mm wide at eaves level) and they are suitable for the applications given in section 7.8.

7.7 Vented soffit board 803 has an effective area of 12 320 mm² per metre run (equivalent to a continuous slot 12.3 mm wide at eaves level) and is suitable for applications given in section 7.8. Vented soffit board 903 has an effective area of 30 890 mm² per metre run (equivalent to a continuous slot of 31 mm wide at eaves level) and is suitable for applications given in sections 7.8 to 7.10.

7.8 For roofs with a pitch of 15° or more, where both the ceiling and insulation are horizontal, soffit ventilators with a minimum effective area of 10 000 mm² per metre run, if used in accordance with section 7.5, can provide adequate ventilation to insulated loft spaces as set out in BS 5250 : 1989, clause 9.4. The soffit ventilators should run along the eaves of the longest opposite sides of a rectangular roof to provide adequate cross-ventilation. The ventilators are suitable for use with traditional (semi-permeable) and high performance (impermeable) sarking felts. Consideration should be given to the use of high-level ventilation openings to increase the ventilation rate for roofs as recommended in BS 5250 : 1989, clause 9.4. The use of high-level ventilation openings is strongly recommended in roofs with a pitch greater than 35° or roof spans in excess of 10 metres.

7.9 For roofs where the ceiling follows the pitch of the roof, soffit ventilators with a minimum effective area of 25 000 mm² per metre run, if used in conjunction with suitable high-level ventilation, can provide adequately for roof voids as set out in BS 5250 : 1989, clause 9.4. It is essential that a minimum unrestricted air space of 50 mm is maintained between the underside of the roofdeck and the top of the insulation. Consideration should be given to the probability of the sarking felt bowing between rafters and it should be ensured that this does not reduce the gap between felt and insulation to less than 50 mm. Where there is an obstruction to the ventilation, eg rooflights or a change in pitch of roof, adequate ventilation, in accordance with the requirements of BS 5250 : 1989, clause 9.4, should be provided above and below the obstruction using suitable ventilators. The required ventilation at high level and around obstructions may be achieved by using a suitable BBA approved ventilator.

7.10 For roofs with a pitch of less than 15°, soffit ventilators with a minimum effective area of 25 000 mm² per metre run, if used in accordance with section 7.5, can provide adequate ventilation to insulated roof voids as set out in BS 5250 : 1989, clause 9.4. When providing roof space ventilation for flat roofs, it is essential that a minimum unrestricted

air space of 50 mm is maintained between the underside of the roof deck and the top of the insulation. Ventilation should be provided along two opposite sides of the deck: where possible these should be the two longest sides in order to achieve maximum cross-ventilation. The recommendations contained in BS 5250 : 1989, clause 9.4, should be followed when planning the provision of ventilation to flat roofs, especially where spans exceed 5 metres, or for concrete deck roofs. Where a flat roof has a span of greater than 10 metres, or is not of a simple rectangular plan, more ventilation will be required, totalling at least 0.6% of the total area of the roof. It should be noted that cold flat roof construction is generally unacceptable in Scotland and not the preferred option elsewhere in the UK⁽¹⁾.

(1) See BRE Report BR 262 : 1994 *Thermal insulation : avoiding risks*.

7.11 Where soffit ventilators are used in lean-to or mono-pitched roofs, high-level ventilation, in accordance with BS 5250 : 1989, clause 9.4, must be provided.

7.12 Where a pitched roof abuts a wall, additional high-level ventilation must be arranged to provide an open area at least equal to a 5 mm slot running the full length of the abutment.

7.13 The soffit ventilator sections meet NHBC requirements for protection against the ingress of birds, rodents or large insects.

7.14 The dimensions of the slots in Kestrel soffit ventilators are such that the risk of blockage is limited. However, blockage by insects and debris would impair their performance as vents and they should be examined occasionally and cleared if necessary.

8 Practicability of installation

8.1 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.

8.2 No special training is required to install the roof trim system correctly, provided the manufacturer's instructions and the procedures outlined in section 14 of this Certificate are followed.

9 Strength and stability

9.1 When installed in accordance with this Certificate, the Kestrel PVC-UE Roofline System will withstand, without damage or permanent deflection, the wind loads likely to be encountered in the United Kingdom. In exposed locations care should be taken to ensure that all profiles are adequately fixed.

9.2 The system has adequate resistance to the hard and soft body impacts likely to occur in practice.

9.3 PVC-U gutters, as specified in BS 4576 : Part 1 : 1989, may be screw-fixed directly to the 16 mm and 22 mm boards. Gutter bracket spacings must not exceed one metre; reduced spacings are recommended in the Scottish Highlands. Other lightweight gutters may also be screw-fixed provided the maximum bracket loading, covered in BS 4576 : Part 1, is not exceeded.

9.4 The 16 mm and 22 mm boards will support all eaves tiles in common usage in the UK (up to 10 kg load per 1 m length of fascia) provided that the boards are installed within the requirements of this Certificate.

9.5 Apart from the exceptions detailed in sections 9.3 and 9.4, the fascia boards are not loadbearing and must not be used to support fixtures such as roof tiles, gutters, other components of the roof structure or television aerials. Telephone wires and power cables may be run along the boards but the main brackets for these services should be fixed through the fascia to structurally sound timber.

10 Performance in relation to fire

10.1 When tested in accordance with BS 476 : Part 7 : 1987 the 22 mm board achieved a Class 1 rating, and the 9 mm board a Class 1Y rating. When tested in accordance with BS 476 : Part 7 : 1997 the 16 mm board achieved a Class 1 rating.

10.2 On exposure to fire, PVC-U tends to char and may fall away. The spread of flame along its surface is limited. It is unlikely that the roof trim system will significantly affect the overall fire performance of any roof in which it is installed.

10.3 Where it is normal practice to carry the eaves box over between dwellings, it is important that the box is fire-stopped at compartment walls.

11 Maintenance

11.1 The system can be cleaned by washing with water and detergent. Solvent-based cleaners should not be used. The material can be cut and drilled, using normal woodworking tools, if repairs are required.

11.2 As with all PVC products, paint can adversely affect the impact strength of the PVC-UE sections, and the application of dark colours could lead to a risk of thermal distortion. Painting is therefore not recommended.

12 Durability



12.1 Accelerated weathering tests indicate that Kestrel PVC-UE is as durable as conventional solid PVC-U.

12.2 The system will retain its decorative qualities for a period in excess of 20 years with only minor changes in surface appearance. It will also retain adequate impact resistance.

12.3 Where the timber substrate is preservative treated with copper/chrome/arsenic, care must be taken to ensure that sufficient time is allowed for complete fixation of the preservative (approximately seven days) to avoid corrosion of screws and nails used to fix the Kestrel components.

Installation

13 General

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

13.2 Fascia, soffit and barge boards should be fixed to structurally sound timber at centres not exceeding 600 mm, using the screws and nails specified by the manufacturer.

13.3 The 16 mm and 22 mm fascia boards may be used directly to support PVC-U and other lightweight gutters (see section 9.3). Other components of the system are not loadbearing (see section 9.5).

13.4 The 16 mm and 22 mm boards may be used to support eaves tiles (see section 9.4). In certain geographical/topographical locations the eaves tiles will need to be restrained in order to resist wind uplift. Guidance on this fixing should be sought from the manufacturer of the eaves tiles.

13.5 Sarking felt should be checked to ensure that it is in good condition and extends onto the verge rafter and over a continuous tilting fillet into the gutter at the eaves. Damaged or worn felt should be replaced.

13.6 Soffit ventilators should be selected and installed so that the roof ventilation conforms to the relevant Building Regulations.

13.7 Normal precautions should be taken when working at roof level. The use of protective goggles when nailing is recommended.

14 Procedure

14.1 Selected boards and accessories are assembled and cut to size.

14.2 Rafter feet are cut to a line.

14.3 Noggings, soffit bearers, battens, eaves fillets, brackets and other additional timber supports are fixed to a sound substrate.

14.4 Protective films should be removed just prior to fixing.

14.5 The summary for the installation details of fascia, soffit and barge boards (see sections 14.6 to 14.17) should be read with reference to the appropriate diagrams in Figures 3 and 4.

Fascia boards

14.6 Fascia boards are fixed to rafter feet at centres not exceeding 600 mm, using at least two fixings per rafter. For the 9 mm board, 40 mm screws or 50 mm annular ring shank nails may be used; for the 16 mm

and 22 mm boards either 50 mm screws or 65 mm annular ring shank nails may be used. For increased rigidity the 9 mm fascia boards may be fixed over a timber backing board using 50 mm screws or 65 mm annular ring shank nails.

14.7 Where necessary, fascia boards are joined using an appropriate cover joint trim. Depending on the board, the joint⁽¹⁾ may be:

- a push-fit joint, in which a low modulus silicone is applied to one side of the trim and the ends of adjacent boards push-fitted into the trim and up to the expansion stops; or
- a nailed joint, in which the trim is fixed to the end of one board by inserting a specified 30 mm nail through the hole provided in the spine of the trim, and to the end of the other board with a low modulus silicone; or
- a glued joint, in which the trim is fixed over the joint and to the end of one board with a low modulus silicone, after both boards are in place.

(1) In each case an expansion gap is provided between the boards, equivalent to 10 mm between two 5 m boards.

14.8 An appropriate corner trim, cut to size, is used at external corners and this joint⁽¹⁾ may be:

- a nailed joint, whereby the trim is fixed to timberwork by inserting specified 30 mm nails through the holes provided in the inner lug of the trim and the board ends pushed into the trim, which may include low modulus silicone; or
- a glued joint, in which the trim is fixed over the joint and to the end of one board with a low modulus silicone, after both boards are in place.

(1) In both cases an expansion gap is left at the end of each board, equivalent to 5 mm per 5 m board.

14.9 Internal corner joints are covered by internal corner trims. These are fixed to the end of one board with a low modulus silicone as described for the glued external corner joint in section 14.8.

14.10 For the 16 mm and 22 mm boards, gutter brackets may be fixed directly into the board using, for each bracket, at least two 30 mm long by 4 mm diameter screws recommended by the manufacturer, ensuring that the screws penetrate the rear face of the board and that the bracket spacings do not exceed one metre. For the 9 mm board, gutter brackets are screwed through the fascia board onto rafter feet or other timber support.

Soffit boards

14.11 Soffit boards fitted into or butted up against fascia boards may be used in a variety of ways as illustrated in Figure 3. Horizontal soffits may be fixed to battens secured to the wall, fixed to soffit bearers, or fitted into soffit channels fixed to the wall. Sloping soffits are fixed directly to the underside of rafters.

14.12 Soffit boards up to 300 mm wide may be fitted between fascia and soffit channel without additional fixing. Otherwise soffit boards should be fixed at maximum 600 mm centres along their length and 300 mm centres across their width, using the specified 40 mm screws or 50 mm annular ring shank nails, with 30 mm cladding nails used for the soffit cladding.

14.13 Vented soffit boards may be used to provide the required ventilation to roof voids. Alternatively, soffit ventilator trims may be incorporated between soffit and fascia boards.

14.14 An H-section trim (soffit joint trim) is used to join soffit boards along their length and at corners, the soffit board end being fitted into the H-section.

Barge boards

14.15 Barge boards are installed by fixing fascia boards to a gable ladder or noggings, using the procedures given for fascia boards in section 14.6.

14.16 Barge boards meeting at a ridge should be mitred to the appropriate angle, allowing 5 mm for expansion between the ends of each 5 metre board. To conceal the joint a D-section trim is fixed to the end of one board using a low modulus silicone. Further low modulus silicone sealant may be applied between the ends of the boards as an additional fixing.

14.17 Box ends are constructed from fascia board and trims to suit the roof pitch and overhang requirement. Any timber framework required in the construction of the box end must be preservative treated.

Figure 3 Typical fascia and soffit details

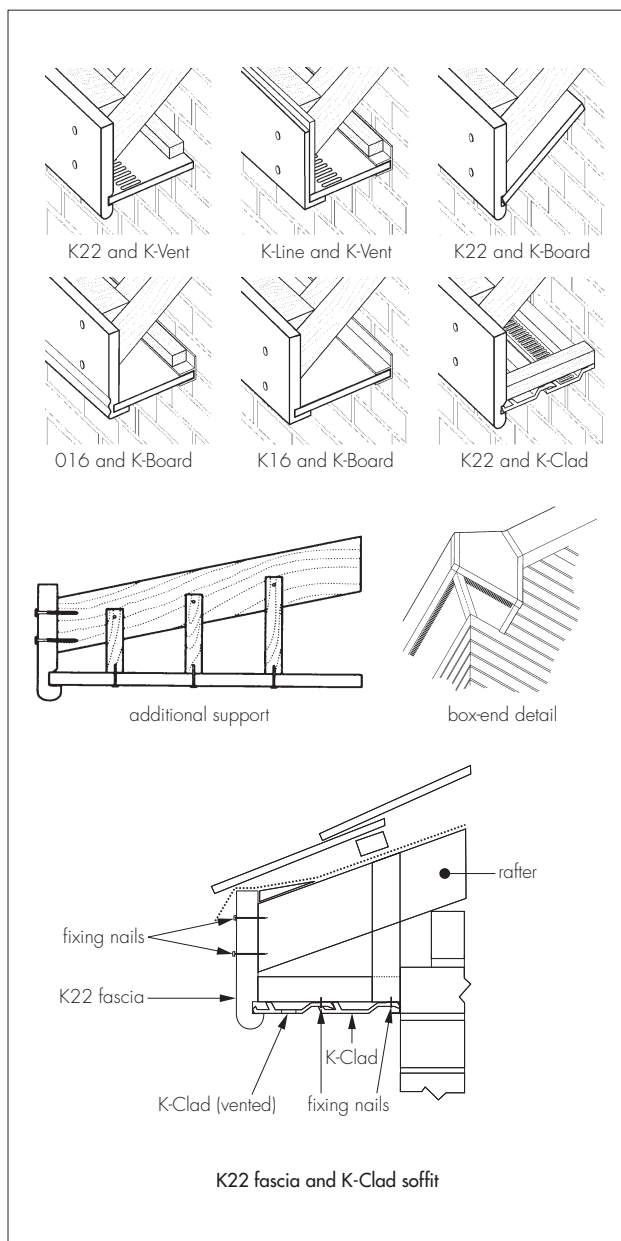
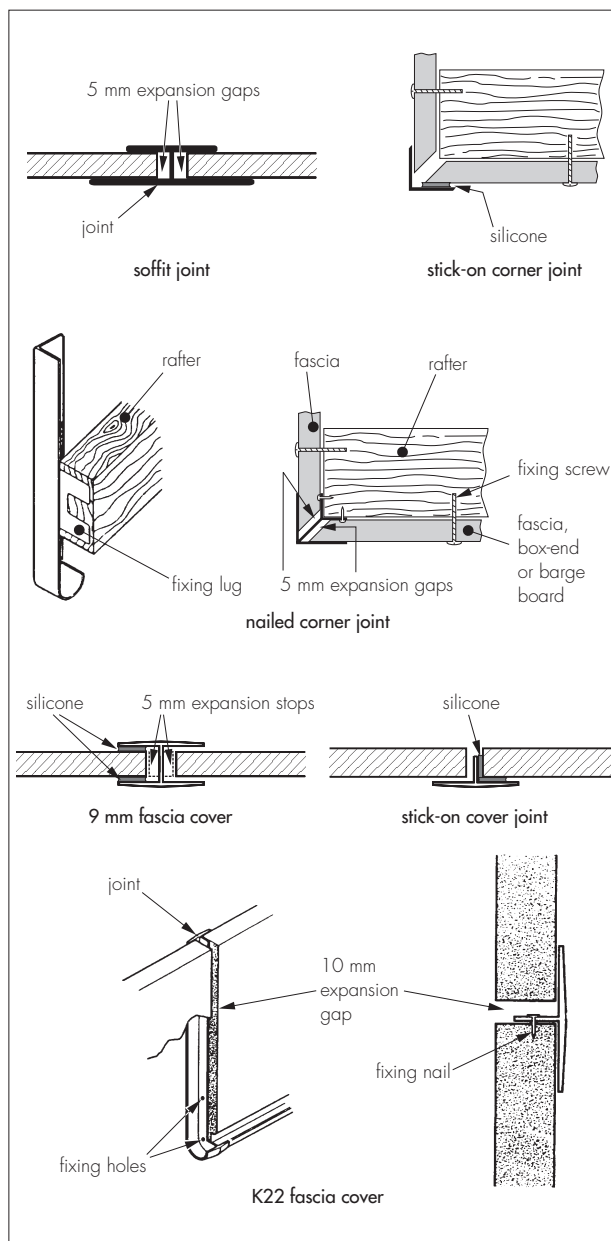


Figure 4 Typical joint details



Technical Investigations

The following is a summary of the technical investigations carried out on the Kestrel PVC-UE Roofline System.

15 Tests

15.1 Tests were carried out to determine:

- thickness of layers
- density
- weight per linear metre
- ash content
- tensile strength and elongation
- modulus of elasticity
- dimensional stability
- impact strength and appearance after UV ageing
- impact strength and appearance after heat ageing
- impact strength and appearance after watersoak ageing
- nail pull-through
- gutter fixing
- heat reversion
- acetone resistance
- stress relief.

15.2 As part of the assessment leading to the issue of this revised Certificate, tile loading tests were carried out on 16 mm fascia boards.

16 Other investigations

16.1 Following the determination of nail pull-through values, calculations were undertaken to establish the resistance of the product to wind suction.

16.2 The dimensions of cellular boards and trims were checked.

16.3 An assessment was made of the acceptability of soffit ventilators in meeting ventilation requirements.

16.4 An examination was made of existing data relating to:

- surface spread of flame
- colour stability.

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

16.6 The practicability of installation was assessed.

16.7 The compatibility and efficacy of the sealants specified for use with the product were assessed.

Bibliography

BS 476 *Fire tests on building materials and structures*
Part 7 : 1987 and 1997 *Method for classification of the surface spread of flame of products*

BS 5250 : 1989(1995) *Code of practice for control of condensation in buildings*

BS 5268 *Structural use of timber*

Part 2 : 1996 *Code of practice for permissible stress design, materials and workmanship*

Part 3 : 1985 *Code of practice for trussed rafter roofs*

BS 6105 : 1981 *Specification for corrosion-resistant stainless steel fasteners*

Conditions of Certification

17 Conditions

17.1 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.

17.2 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.

17.3 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.

17.4 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.

17.5 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 Kestrel PVC-UE Roofline System is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 95/3117 is accordingly awarded to Kestrel Building Products.

On behalf of the British Board of Agrément

Date of Third issue: 10th August 2001


Chief Executive

**Original Certificate issued 28th March 1995. This amended version includes change of Certificate holder's name and revised Conditions of Certification.*

