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Agrément Certificate

08/4550

Product Sheet 1

KEYLITE ROOF WINDOWS

KEYLITE CENTRE PIVOT ROOF WINDOWS WITH INTEGRATED THERMAL COLLAR

This Agrément Certificate Product Sheet⁽¹⁾ relates to Keylite Centre Pivot Roof Windows with Integrated Thermal Collar, for use on roofs of new and existing domestic and non-domestic buildings with a pitch between 15 and 90°, to provide natural light and ventilation.

(1) Hereinafter referred to as 'Certificate'.

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 properties — the thermal transmittance (U values) of the products are 1.0 W·m⁻²·K⁻¹ (triple-glazed) and 1.3 W·m⁻²·K⁻¹ (double-glazed) (see section 7).

Weathertightness — the products can be used in the exposure situations described in this Certificate (see section 8)

Structural stability — the products can be selected to have adequate resistance to wind loads calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex (see section 9).

Ventilation — the products can provide rapid ventilation and background ventilation (see section 10).

Behaviour in relation to fire — the glazing used in the products can be considered as a non-combustible material. The products can be used for emergency egress (see section 11).

Unauthorised access — the range of products can contribute to preventing unauthorised access to dwellings, light commercial premises and similar habitable applications (see section 15).

Durability — the life of the products will be at least equal to conventional timber windows. Any slight external colour change or surface dulling of the aluminium covers that might occur will be uniform over the visible surfaces of the windows. The internal and external finishes will maintain an acceptable appearance for up to 10 and 15 years, respectively (see section 18).



The BBA has awarded this 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 Fourth issue: 17 April 2019

John Albon
Chief Scientific Officer

Claire Curtis-Thomas
Chief Executive

Originally certificated on 15 August 2008

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.

Any photographs are for illustrative purposes only, do not constitute advice and should not be relied upon.

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Regulations

In the opinion of the BBA, Keylite Centre Pivot Roof Windows with Integrated Thermal Collar, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):



The Building Regulations 2010 (England and Wales) (as amended)

Requirement: A1	Loading
Comment:	The products will have sufficient strength and stiffness to sustain the imposed load. See sections 9.1 and 9.2 of this Certificate.
Requirement: B1	Means of warning and escape
Comment:	Windows of an appropriate size can be used as an escape route from floors not more than 4.5 m above ground level. See section 11.4 of this Certificate.
Requirement: B2	Internal fire spread (linings)
Comment:	The glazing used in the products can be regarded as a non-combustible material. See section 11.1 of this Certificate.
Requirement: B4(2)	External fire spread
Comment:	When used in roof windows, unwired glass at least 4 mm thick can be regarded as having a B _{ROOF} (t4) designation. See section 11.2 of this Certificate.
Requirement: C2(b)	Resistance to moisture
Comment:	The windows will resist water ingress. See sections 8.1 to 8.3 of this Certificate.
Requirement: C2(c)	Resistance to moisture
Comment:	The windows can contribute to satisfying this Requirement. Vents will provide airflow to alleviate surface condensation. See sections 10 and 13 of this Certificate.
Requirement: F1(1)	Means of ventilation
Comment:	In assessing the contribution of the products to natural purge ventilation, the area of opening given in section 10.1 of this Certificate should be related to floor area as set out in Approved Document F. Background ventilation is provided by vents incorporated in the windows. See sections 10.2 and 10.3 of this Certificate.
Requirement: K	Protection from falling, collision and impact
Requirement: K4(a)(b)	Protection against impact with glazing (applicable to England only)
Comment:	Glazing less than 800 mm above floor level must satisfy the requirements of K4 and should comply with the requirements of BS EN 12600 : 2002. See section 14.3 of this Certificate.
Requirement: K5.3	Safe opening and closing of windows etc (applicable to England only)
Comment:	This Requirement can be satisfied. Windows which can be opened by people in or about the building should be constructed or equipped so that they can be opened, closed or adjusted safely. See section 14.2 of this Certificate.
Requirement: K5.4	Safe access for cleaning windows etc (applicable to England only)
Comment:	This Requirement can be satisfied. See section 14.1 of this Certificate.
Requirement: L1(a)(i)	Conservation of fuel and power
Comment:	In calculating the heat loss through windows, the U values given in sections 7.1 to 7.3 of this Certificate should be used. The products can also contribute to daylighting and solar transmittance (see section 12 of this Certificate).

Requirement:	N1	Protection against impact (applicable to Wales only)
Comment:		Glazing less than 800 mm above floor level should satisfy the requirements of N1 and should comply with the requirements of BS EN 12600 : 2002. See section 14.3 of this Certificate.
Requirement:	N3	Safe opening and closing of windows, skylights and ventilators (applicable to Wales only)
Comment:		Windows which can be opened by people in or about the building should be constructed or equipped so that they can be opened, closed or adjusted safely. See section 14.2 of this Certificate.
Requirement:	N4	Safe access for cleaning windows etc (applicable to Wales only)
Comment:		This Requirement can be satisfied. See section 14.1 of this Certificate.
Regulation:	7	Materials and workmanship (applicable to Wales only)
Regulation:	7(1)	Materials and workmanship (applicable to England only)
Comment:		The products are acceptable. See sections 18.1, 18.2 and 18.4 to 18.6 and the <i>Installation</i> part of this Certificate.
Regulation:	26	CO₂ emission rates for new buildings
Regulation:	26A	Fabric energy efficiency rates for new dwellings (applicable to England only)
Regulation:	26A	Primary energy consumption rates for new buildings (applicable to Wales only)
Regulation:	26B	Fabric performance values for new dwellings (applicable to Wales only)
Comment:		The products can contribute to satisfying these Regulations. See sections 7.1 to 7.3 of this Certificate.



The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)(2)	Durability, workmanship and fitness of materials
Comment:		The products satisfy the requirements of this Regulation. See sections 17.1 to 17.3, 18.1, 18.2 and 18.4 to 18.6 and the <i>Installation</i> part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	1.1(b)	Structure
Comment:		The products will have sufficient strength and stiffness to sustain the imposed loads, with reference to clauses 1.1.1 ⁽¹⁾⁽²⁾ , 1.1.2 ⁽¹⁾⁽²⁾ and 1.1.3 ⁽¹⁾⁽²⁾ . See sections 9.1 and 9.2 of this Certificate.
Standard:	2.5	Internal linings
Comment:		The glazing used in the products can be regarded as non-combustible material with reference to clause 2.5.1 ⁽¹⁾⁽²⁾ . See section 11.1 of this Certificate.
Standard:	2.8	Spread from neighbouring buildings
Comment:		When used in roof windows, glass at least 4 mm thick is classified as 'low vulnerability' material, with reference to clause 2.8.1 ⁽¹⁾⁽²⁾ . See section 11.3 of this Certificate.
Standard:	2.9	Escape
Comment:		Windows of an appropriate size can be used as an escape route from an apartment on an upper storey at a height of not more than 4.5 m above ground level, with reference to clause 2.9.4 ⁽¹⁾ . See section 11.4 of this Certificate.
Standard:	3.10	Precipitation
Comment:		The products will resist water ingress, with reference to clause 3.10.1 ⁽¹⁾⁽²⁾ . See sections 8.1 to 8.3 of this Certificate.

Standard:	3.14	Ventilation
Comment:		In calculating the contribution of the windows to natural ventilation, with reference to clause 3.14.1 ⁽¹⁾⁽²⁾ of this Standard, see section 10.1 of this Certificate. Trickle ventilation, with reference to clauses 3.14.3 ⁽²⁾ and 3.14.6 ⁽¹⁾ , is provided by vents incorporated in the windows. See sections 10.1 and 10.2 of this Certificate.
Standard:	3.15	Condensation
Comment:		The windows can contribute to satisfying this Standard with reference to clauses 3.15.1 ⁽¹⁾⁽²⁾ , 3.15.2 ⁽¹⁾⁽²⁾ and 3.15.4 ⁽¹⁾⁽²⁾ . See section 13 of this Certificate. Vents will provide airflow to alleviate surface condensation with reference to clause 3.15.4 ⁽¹⁾⁽²⁾ . See sections 10.1, 10.2 and 13 of this Certificate.
Standard:	3.16	Natural lighting
Comment:		In calculating the contribution of the windows to natural lighting, with reference to clauses 3.16.1 ⁽¹⁾ and 3.16.3 ⁽¹⁾ of this Standard. See section 12 of this Certificate.
Standard:	4.8(b)	Danger from accidents
Comment:		Glazing must comply with BS 6262-4 : 2018 where accidental collision with it is likely, in order to satisfy this Standard with reference to clause 4.8.2 ⁽¹⁾⁽²⁾ . See section 14.3 of this Certificate.
Standard:	4.8(c)	Danger from accidents
Comment:		The products can be safely cleaned from inside the building, with reference to clause 4.8.3 ⁽¹⁾⁽²⁾ . See section 14.1 of this Certificate.
Standard:	4.8(e)	Danger from accidents
Comment:		Opening lights that can be opened, closed and adjusted safely can satisfy this Standard. See section 14.2 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		In calculating the heat loss through windows, the U values given in sections 7.1 to 7.3 of this Certificate should be used.
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The products can contribute to satisfying the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the products can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾], 7.1.6 ⁽¹⁾⁽²⁾ [Aspects 1 ⁽¹⁾⁽²⁾ and 2 ⁽¹⁾] and 7.1.7 ⁽¹⁾⁽²⁾ [Aspect 1 ⁽¹⁾⁽²⁾]. See sections 7.1 to 7.3 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for these windows under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1 ⁽¹⁾⁽²⁾ and Schedule 6 ⁽¹⁾⁽²⁾ .
		(1) Technical Handbook (Domestic). (2) Technical Handbook (Non-Domestic).



The Building Regulations (Northern Ireland) 2012 (as amended)

Regulation:	23	Fitness of materials and workmanship
Comment:		The products are acceptable. See sections 18.1, 18.2 and 18.4 to 18.6 and the <i>Installation</i> part of this Certificate.
Regulation:	28(b)	Resistance to moisture and weather
Comment:		The products will not adversely affect the resistance of the roof to the passage of moisture. See sections 8.1 to 8.3 of this Certificate.

Regulation:	30	Stability
Comment:		The products will have sufficient strength and stiffness to sustain the imposed load. See sections 9.1 and 9.2 of this Certificate.
Regulation:	33	Means of escape
Comment:		Windows of an appropriate size can be used as an escape route in dwellings. See section 11.4 of this Certificate.
Regulation:	34	Internal fire spread — Linings
Comment:		The glazing used in the roof windows can be regarded as non-combustible material. See section 11.1 of this Certificate.
Regulation:	36(b)	External fire spread
Comment:		When used in roof windows, unwired glass at least 4 mm thick can be regarded as having a B _{ROOF} (t4) designation. See section 11.2 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:		In calculating the heat loss through windows, the U values given in sections 7.1 to 7.3 of this Certificate should be used.
Regulation:	65(1)	Means of ventilation
Comment:		When calculating the area of window openings for ventilation purposes, see section 10.1 of this Certificate. Trickle ventilation is provided by vents incorporated in the windows. See sections 10.2 and 10.3 of this Certificate.
Regulation:	96	Impact with glazing
Comment:		Where people are likely to come into contact with glazing in a building, the requirements of this Regulation are deemed to be satisfied if the glazing complies with Technical Booklet V, Section 2. See section 14.3 of this Certificate.
Regulation:	98	Safe opening and closing of windows, skylights and ventilators
Comment:		Any window which can be opened by a person must be so constructed or equipped that it may be opened, closed and adjusted safely. The requirements of this Regulation are deemed to be satisfied if the window complies with Technical Booklet V, Section 4. See section 14.2 of this Certificate.
Regulation:	99	Safe means of access for cleaning glazing
Comment:		Reasonable provision must be made for safe means of access to clean glazing. The requirements of this Regulation are deemed to be satisfied if the means of access complies with Technical Booklet V, Section 5. See section 14.1 of this Certificate.

Construction (Design and Management) Regulations 2015

Construction (Design and Management) Regulations (Northern Ireland) 2016

Information in this Certificate may assist the client, designer (including Principal Designer) and contractor (including Principal Contractor) to address their obligations under these Regulations.

See sections: 3 *Delivery and site handling* (3.4) and 14 *Safety* (14.4) of this Certificate.

Additional Information

NHBC Standards 2019

In the opinion of the BBA, Keylite Centre Pivot Roof Windows with Integrated Thermal Collar, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements in relation to *NHBC Standards*, Chapter 6.7 *Doors, windows and glazing*.

CE marking

The Certificate holder has taken the responsibility of CE marking the products in accordance with harmonised European Standard BS EN 14351-1 : 2006 + A2 : 2016.

Technical Specification

1 Description

1.1 Keylite Centre Pivot Roof Windows with Integrated Thermal Collar (see Figures 1 and 2 of this Certificate) are available in a range of sizes (see Table 1) and comprise single-opening lights revolving around a centre pivot.

1.2 Keylite Centre Pivot Roof Windows with Integrated Thermal Collar are fabricated from preserved multi-laminated softwood frames and sashes, and feature coil-coated aluminium covers on the external faces and clear satin water-based acrylic lacquer on the internal faces.

1.3 For conservation areas, Keylite Conservation Roof Windows with Integrated Thermal Collar are available, which feature black coil-coated aluminium on the external faces and clear satin water-based acrylic lacquer on the internal faces; they are supplied complete with mullion (see Figure 3).

1.4 The roof windows are factory-glazed using sealed double-glazed or triple-glazed (4/10/4/8/4) units. The double-glazed units comprise a 4 mm thick outer pane made of toughened or laminated glass, a 20 mm argon-filled cavity and a 4 mm thick inner pane made of float glass featuring a low emissivity coating, or a 4 mm toughened outer pane, an 18 mm argon-filled cavity and a 6.38 mm thick inner pane made of laminated glass featuring a low emissivity coating. The triple-glazed units comprise a 4 mm thick outer pane made of toughened or laminated glass, a 10 mm krypton-filled cavity, a 4 mm thick pane made of float glass featuring a low emissivity coating, an 8 mm krypton-filled cavity and a 4 mm thick inner pane made of float glass featuring a low emissivity coating. Glazing units carry CE marking to show compliance with BS EN 1279-5 : 2018.

1.5 NHBC require⁽¹⁾ that compliance to the Standard referred to in section 1.4 of this Certificate is confirmed by an appropriate independent technical approvals authority.

(1) *NHBC Standards 2019, Chapter 6.7.7 Glazing, Insulating Glass Units.*

1.6 Glazing units are sealed into the wooden sash using EPDM gaskets on the inside and butyl tape on the outside. The glazing unit is secured with aluminium glazing beads.

1.7 The aluminium profiles protecting the outer frames and sash are fabricated from aluminium sheet alloys type EN AW-1050A, EN AW-3003 and EN AW-3105, to BS EN 573-3 : 2013. The thickness of the aluminium covers depends on the component (1.0 or 0.7 mm thick). The covers are secured to the wood core with polyester-powder-coated, zinc-plated mild steel screws.

1.8 The coil-coating on the aluminium components is available in grey finish as standard (other colour finishes are an option) and – for conservation windows – black, with a minimum thickness of 25 µm.

1.9 The windows are operated by the upper control bar, which is constructed from anodized aluminium alloy. For cleaning and maintenance, the centre pivot hinges (which are constructed from a combination of zinc-plated mild steel and acetal homopolymer resin) allow the sash to be turned through 180° and secured in position by engaging one or two bolts (depending on window size). A key-operated lock⁽¹⁾ (or two, depending on window size) is available and can be fitted at the bottom of the sash pivot.

(1) Outside the scope of this Certificate.

Figure 1 Keylite Centre Pivot Roof Window with Integrated Thermal Collar cross sections

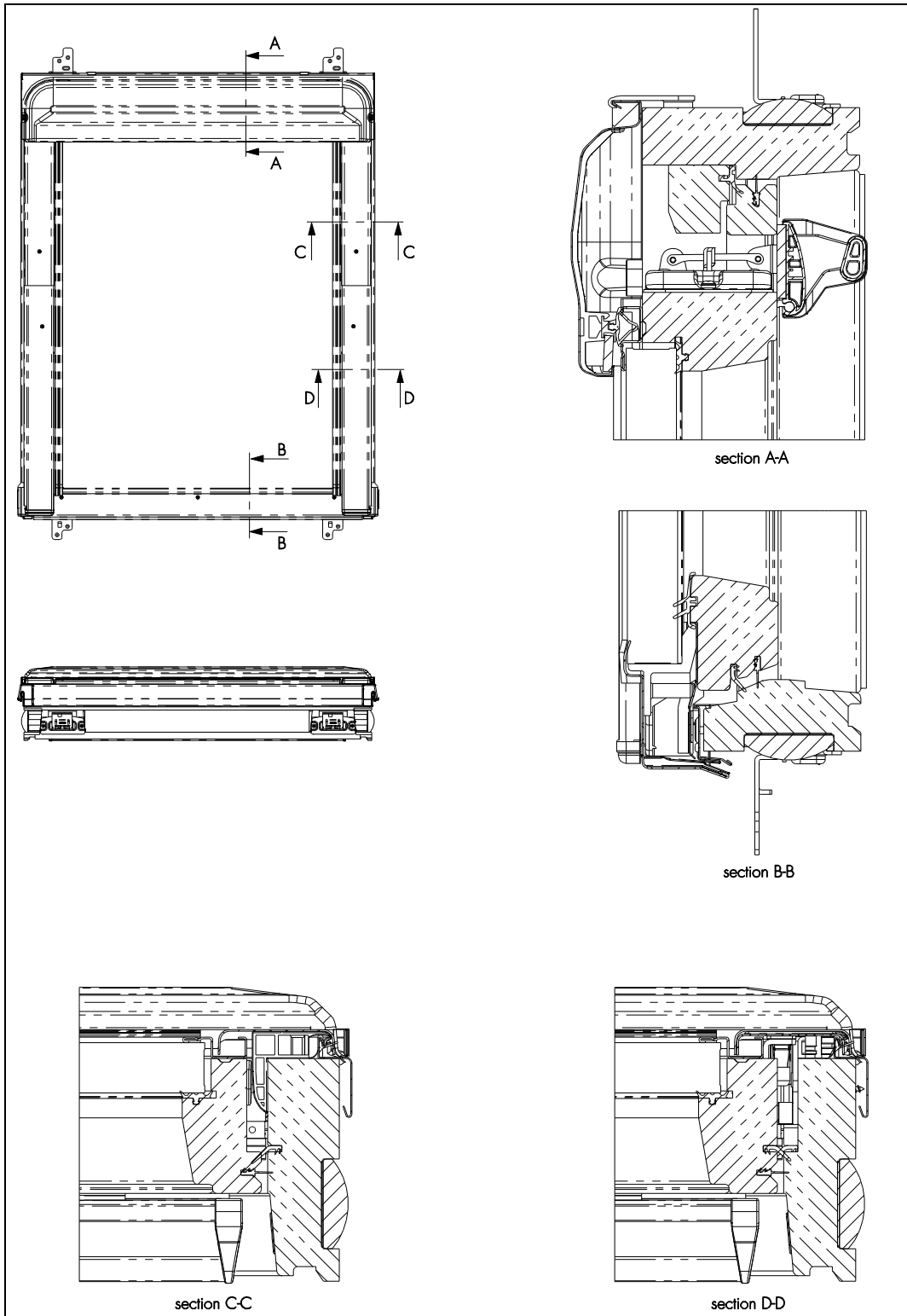
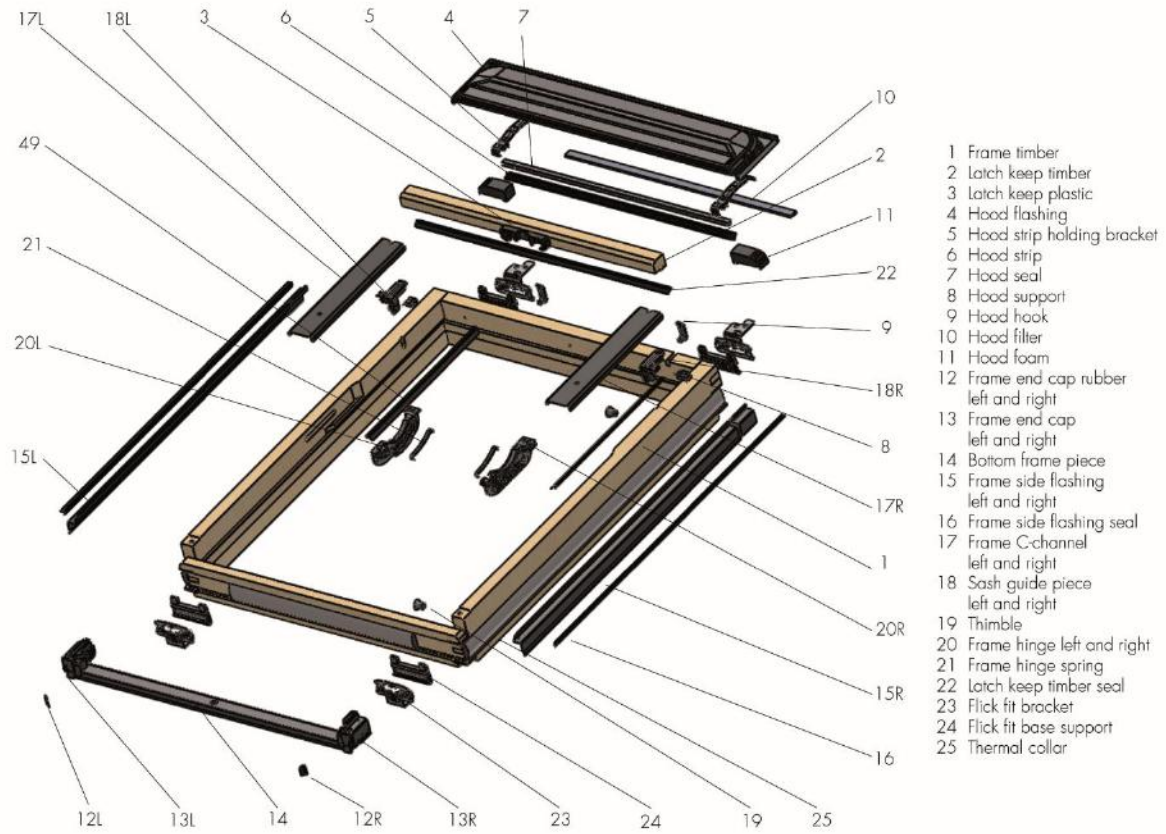
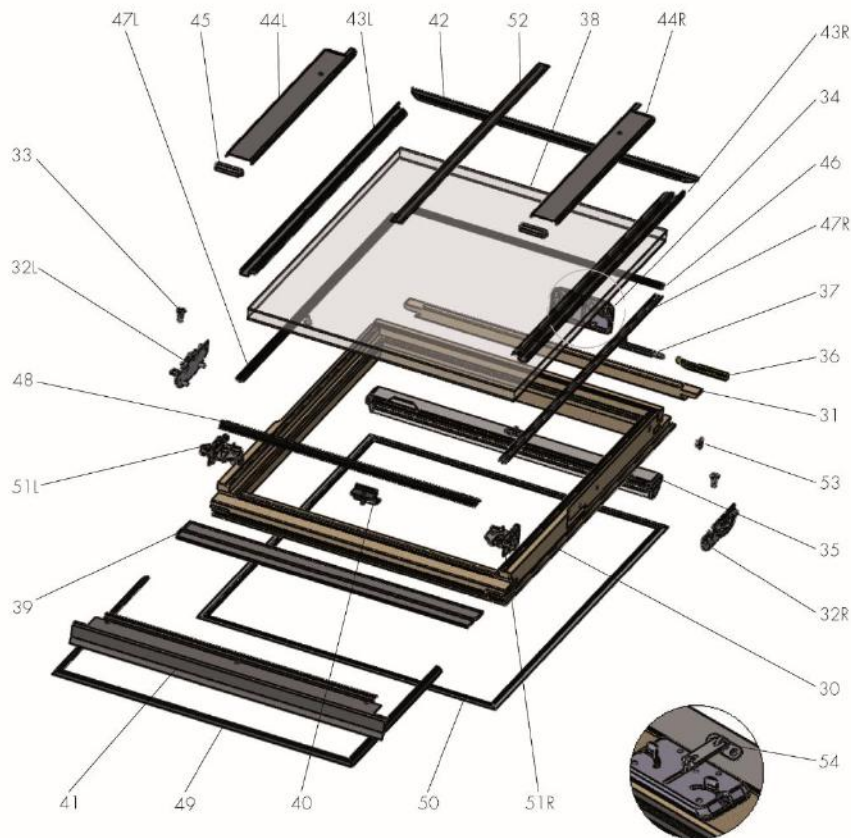


Figure 2 Keylite Centre Pivot Roof Window with Integrated Thermal Collar components



- 1 Frame timber
- 2 Latch keep timber
- 3 Latch keep plastic
- 4 Hood flashing
- 5 Hood strip holding bracket
- 6 Hood strip
- 7 Hood seal
- 8 Hood support
- 9 Hood hook
- 10 Hood filter
- 11 Hood foam
- 12 Frame end cap rubber left and right
- 13 Frame end cap left and right
- 14 Bottom frame piece
- 15 Frame side flashing left and right
- 16 Frame side flashing seal
- 17 Frame C-channel left and right
- 18 Sash guide piece left and right
- 19 Thimble
- 20 Frame hinge left and right
- 21 Frame hinge spring
- 22 Latch keep timber seal
- 23 Flick fit bracket
- 24 Flick fit base support
- 25 Thermal collar



- 30 Sash timber
- 31 Top rail
- 32 Sash hinge left and right
- 33 Traffic cone
- 34 Latch
- 35 Vent flap handle
- 36 Locking bolt housing
- 37 Locking bolt plastic
- 38 Glazing unit
- 39 Lower glazing piece
- 40 Glazing boss
- 41 Upper glazing piece
- 42 Glazing border top
- 43 Glazing border left and right
- 44 Sash C-channel left and right
- 45 C-channel end cap
- 46 Glazing seal top
- 47 Glazing seal left and right
- 48 Glazing seal bottom
- 49 Sash side/bottom seal
- 50 Secondary weather seal
- 51 Sash end cap left and right
- 52 Georgian bar (conservation windows)
- 53 Sash guide plug
- 54 Link bar

Figure 3 Conservation window



1.10 EPDM weatherstripping is located in the grooves around the periphery of the opening light frame below the hinge axis and around the outer frame above the hinge axis. A base seal is fitted to the bottom member of the opening light.

1.11 The windows are equipped with a built-in background ventilator equipped with a built-in open mesh dust- and insect-filter fitted in the top member on the external face of the sash.

1.12 The windows are equipped with a thermal collar made from elastic polyurethane foam (see Figure 4), which is released during the installation of the windows.

Table 1 Size range

Window code	Conservation window code	Modular size width x height (mm)	Outer frame dimensions (mm)		Opening light dimensions (mm)	
			Width	Height	Width	Height
CP01	CW-CP-01-T	550 x 780	550	780	371	531
CP02	CW-CP-02-T	550 x 980	550	980	371	731
CP03	CW-CP-03-T	660 x 1180	660	1180	481	931
CP04	—	780 x 980	780	980	601	731
CP05	CW-CP-05-T	780 x 1180	780	1180	601	931
CP06	CW-CP-06-T	780 x 1400	780	1400	601	1151
CP07	—	940 x 1600	940	1600	761	1351
CP08	—	1140 x 1180	1140	1180	961	931
CP09	CW-CP-09-T	1340 x 980	1340	980	1161	731

1.13 Flashings are available from the Certificate holder, but are outside the scope of this Certificate.

2 Manufacture

2.1 The machined timber components of the sash and frame are glued and nailed together, and the Integrated Thermal Foam Collar is glued to the frame. The sash hinges, seals, latches, locking bolt, vent flap and top rail are then fitted. The

coil-coated aluminium covers are attached on the external faces with screws and the acrylic lacquer is applied on the internal faces. The sash is swung into the frame and the glazing unit and mastic are fitted.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

3 Delivery and site handling

3.1 The windows are delivered to site ready glazed, and protected in cardboard boxes to avoid damage.

3.2 Each window has a label bearing the company's logo, CE marking, product and manufacturing details for traceability, and the BBA identification logo incorporating the number of this Certificate.

3.3 The windows should be stored under cover in a clean area, on edge and suitably supported to avoid distortion or damage.

3.4 The weight of the roof window is given on the box. The weight of the window and its ease of handling, particularly by one person, must be taken into account when planning site operations.

4 Environmental information

The timber used in the construction of the roof windows is FSC certified.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Keylite Centre Pivot Roof Windows with Integrated Thermal Collar.

Design Considerations

5 Use

5.1 Keylite Centre Pivot Roof Windows with Integrated Thermal Collar are suitable for use on roofs of new and existing domestic and non-domestic buildings, with a pitch between 15 and 90°, to provide natural light and ventilation. New roofs should be designed in accordance with the relevant national Building Regulations.

5.2 The products are suitable for existing roofs and the replacement of existing roof windows. For such installations, it is important that the roof is checked for structural adequacy by a suitably qualified and experienced individual, and strengthened as required to support the additional loads imposed upon it by the installation of the roof windows.

6 Practicability of installation

The products are designed to be installed by a competent general builder, or a contractor, experienced with these types of products.

7 Thermal properties



7.1 The thermal transmittance (U value) of a Keylite Centre Pivot Roof Window with Integrated Thermal Collar, 1140 mm wide by 1180 mm high, incorporating a centre pivot opening light and glazed with a 4/18/6.38 mm sealed, double-glazed unit with a 4 mm toughened Guardian Float Glass Extra Clear outer pane, 18 mm argon-filled cavity (90%) with Chromatech Ultra spacer and 6.38 mm Guardian Clima Guard Premium/Guardian LamiGlass ExtraClear 3(0.38)3, laminated thick inner pane ($U_g = 0.9 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$) when measured by the Hot Box method according to BS EN ISO 12567-2 : 2005, is $1.3 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$. In the opinion of the BBA, the thermal transmittance (U value) of the conservation roof windows, incorporating the same glazing units, would be similar.

7.2 The thermal transmittance (U value) of a Keylite Centre Pivot Roof Window with Integrated Thermal Collar, 1140 mm wide by 1180 mm high, incorporating a centre pivot opening light and glazed with a 4/10/4/8/4 mm sealed, triple-glazed unit with 4 mm toughened Planilux Bio-clean outer pane, 10 mm krypton-filled cavity (90%) with Chromatech Ultra spacer, 4 mm Planilux Planitherm Ultra N, 8 mm krypton-filled cavity (90%) Chromatech Ultra and 4 mm thick Planilux Planitherm Ultra N inner pane ($U_g = 0.6 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$) when measured by the Hot Box method according to BS EN ISO 12567-2 : 2005, is $1.0 \text{ W}\cdot\text{m}^{-2}\cdot\text{K}^{-1}$. In the opinion of the BBA, the thermal transmittance (U value) of the conservation roof windows, incorporating the same glazing units, would be similar.

7.3 For the purposes of heat loss calculations, the U values measured in sections 7.1 and 7.2 of this Certificate should be adjusted according to the installed slope of the roof window, in accordance with Section 11.1 of BRE Report BR 443 : 2006.

7.4 The overall thermal insulation of the window will be dependent on the performance of the glazed units. For units other than those described above, the indicative U values shown in Table 6e of SAP 2012 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings* can be used. When available, a certified U value by measurement to BS EN ISO 12567-2 : 2005, or calculation to BS EN ISO 10077-1 : 2017 and BS EN ISO 10077-2 : 2017, should be used in preference.

7.5 Design U values are detailed in the documents supporting the national Building Regulations.

8 Weathertightness



8.1 When installed in accordance with the Certificate holder's instructions and sections 20 and 21 of this Certificate, the windows will adequately resist water ingress.

8.2 Selected samples were tested for weathertightness, generally in accordance with BS EN 14351-1 : 2006, BS EN 1026 : 2016, BS EN 1027 : 2016 and BS EN 12211 : 2016, and are suitable for use as indicated in Table 2 of this Certificate. The classifications are based on the assumption that the outer frame is supported on all four sides in accordance with the Certificate holder's instructions.

8.3 The classifications in Table 2 can be used to determine suitability when selecting exposure category, in conjunction with Annex A of BS 6375-1 : 2015.

Table 2 Weathertightness classifications

	Classification to		
	BS EN 12207 : 2016	BS EN 12208 : 2000	BS EN 12210 : 2016
Air permeability ⁽¹⁾⁽²⁾	Class 3	—	—
Watertightness ⁽¹⁾⁽²⁾⁽³⁾	—	Class E1050	—
Resistance to wind load ⁽¹⁾	—	—	Class 4

(1) Window tested in the vertical position.

(2) Vent sealed.

(3) Window tested at 15°.

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

9 Structural stability



9.1 The products can be selected to have adequate resistance to wind loads calculated in accordance with BS EN 1991-1-4 : 2005 and its UK National Annex.

9.2 Snow load will depend upon a number of factors, such as height above sea level, geographical location and roof arrangement. Therefore, it is recommended that BS EN 1991-1-3 : 2003 and its UK National Annex is used to calculate the actual snow load to be anticipated for a specific installation.

9.3 Details of connections between the roof window and the roof must be determined by a suitably qualified and experienced individual. Guidance is available from the Certificate holder.

10 Ventilation



10.1 The approximate opening area for rapid natural ventilation is given in Table 3 of this Certificate.

10.2 Contribution to the background ventilation requirements of the various national Building Regulations can be made by the air vent incorporated in the windows (see Figure 4).

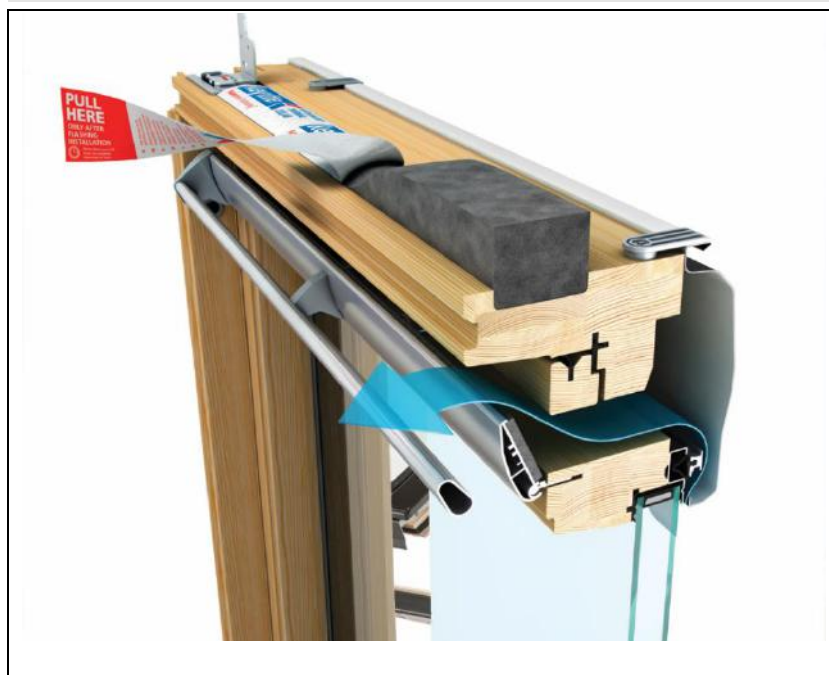
Table 3 Approximate opening area for rapid natural ventilation and equivalent areas of vents

Window code	Modular size width x height (mm)	Opening area for rapid natural ventilation (m ²)	Length of vent (mm)	Equivalent area for trickle ventilation (mm ²) ⁽¹⁾	Equivalent area for trickle ventilation (mm ²) ⁽²⁾
CP01	550 x 780	0.27	391		2293
CP02	550 x 980	0.37	391		2293
CP03	660 x 1180	0.57	501		2752
CP04	780 x 980	0.55	621	3252	3252
CP05	780 x 1180	0.69	621		3252
CP06	780 x 1400	0.84	621		3252
CP07	940 x 1600	1.20	781		3919
CP08	1140 x 1180	1.04	981		4753
CP09	1340 x 980	0.98	1181		5586

(1) Value obtained from tests to BS EN 13141-1 : 2004.

(2) Based on an equivalent area of 4169 mm² per metre width of window.

Figure 4 Integral air vent





10.3 An example equivalent area of a vent, when tested in accordance with BS EN 13141-1 : 2004, of a Keylite Centre Pivot Roof Window with Integrated Thermal Collar is given in Table 3 of this Certificate.

11 Behaviour in relation to fire



11.1 The glazing used in the windows is Class A1 by reference to the European Commission Decision 96/603/EC and can therefore be considered as non-combustible.



11.2 When used in roof windows, unwired glass at least 4 mm thick can be regarded as having a B_{ROOF(t4)} designation.



11.3 When used in roof windows, glass at least 4 mm thick is classified as 'low vulnerability' material.



11.4 Where a window is required in a dwelling to provide a means of escape from an inner room or a loft space converted into a habitable room, the window can satisfy the relevant requirements of the national Building Regulations when it:

- is in a room with a floor not more than 4.5 m above ground level
- is positioned so that the bottom of the opening is no more than 1.1 m above the floor
- provides a clear opening area of at least 0.33 m² and is not less than 450 mm high by 450 mm wide, which may be at an angle or straight through. The obstruction caused by opening lights hung on top-hung or pivot hinges must be taken into account when the clear opening is determined. In addition:

England and Wales — windows must remain open without needing to be held.

Scotland — locks may be used but must not cause a permanent obstruction to satisfy clause 2.9.4⁽¹⁾ as escape windows

(1) Technical Booklet (Domestic).

Northern Ireland — the window must be positioned not less than 600 mm above the floor.

11.5 It is recommended that windows must remain open without needing to be held, where this is not a regulatory requirement.

12 Glass area



The approximate visible glass area of the windows is given in Table 4, below.

Table 4 Approximate visible glass area

Window code	Visible glass area (m ²)
CP01	0.20
CP02	0.27
CP03	0.45
CP04	0.44
CP05	0.56
CP06	0.69
CP07	1.03
CP08	0.89
CP09	0.85

13 Condensation risk



Experience of products similar to Keylite Centre Pivot Roof Windows with Integrated Thermal Collar has shown that, in normal domestic or similar applications, roof windows do not constitute a significant condensation risk when correctly installed. Guidance on design details is given in *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings*, TSO, 2002. Further information is contained in BRE Report BR 262 : 2002. Also see section 10 of this Certificate.

14 Safety



14.1 The external pane of the glazing unit can be cleaned from inside the building.

14.2 The windows can comply with the recommendations of BS 8213-1 : 2004 with regard to the positioning of hand-operated controls.

14.3 Account must be taken of the recommendations given in BS 6262-4 : 2018 which, in certain circumstances, include the use of safety glass complying with BS EN 12600 : 2002. Windows installed with safety glazing complying with BS EN 12600 : 2002 must be installed where accidental collision is likely.

14.4 When selecting means of access during the period of installation (for example use of scaffolding), the safety of the operatives, occupants and passers-by should be considered.

15 Unauthorised access

15.1 When fastened in the closed position, the opening light cannot be opened from the outside by manipulation from the outside (for example, by the insertion of a thin blade). Key-operated locks⁽¹⁾ are required for certain windows which are readily accessible from the outside, to satisfy the security requirements of *NHBC Standards 2019 Chapter 6.7 Doors, windows and glazing*. It is the responsibility of the building designer to specify where these requirements need to be satisfied.

(1) Outside the scope of this Certificate.

15.2 The arrangement of the aluminium cladding and glazing-retaining profiles ensures that removal of the glass from the outside is difficult.

16 Ease of operation

The window can be operated without difficulty when correctly installed.

17 Maintenance



17.1 The window can be re-glazed and the gaskets and weatherstripping replaced, but these operations are outside the scope of this Certificate.

17.2 If damage occurs, the furniture and fittings can be replaced.

17.3 The pivot hinges are designed to be maintenance free. The locking mechanism can be lubricated periodically to minimise wear and to ensure smooth operation.

17.4 The external glazing and external frame members can be cleaned using a soft sponge and soapy water. If dirt is allowed to build up on the members over long periods, it may become more difficult to restore the surface appearance.

17.5 Care should be taken when using proprietary materials for cleaning the glass, to ensure that deposits are not allowed to remain on the wood or aluminium surfaces where they may cause discoloration and damage to the surface (further details are available in the maintenance instructions supplied with the windows, or from the Certificate

holder). In addition, care must be taken to avoid damage to, or discoloration of, the members when stripping paint from adjacent timber (for example, by means of a blowlamp or paint stripper).

17.6 Maintenance painting of the external and internal finishes should be considered at the intervals defined in sections 18.2 and 18.4 respectively of this Certificate (or earlier if a high aesthetic standard is required). The Certificate holder can recommend a suitable paint and maintenance system, but this is outside the scope of the Certificate.

18 Durability



18.1 The external faces of the frames and sashes are protected by aluminium covers. Therefore, the life of the roof windows is expected to be at least equal to conventional timber windows.

18.2 The performance of the external coating will depend on its environment, location and aspect face. It will retain a good appearance for at least 15 years.

18.3 Any external colour change or surface dulling of the aluminium covers that might occur will be uniform over any one elevation.



18.4 The internal finish will maintain an acceptable appearance for up to 10 years. This may be reduced in areas of high humidity such as kitchens or bathrooms, or if subjected to mechanical damage. The appearance can be restored by overcoating, but this is outside the scope of the Certificate.

18.5 The fittings described in this Certificate (including pivot hinges and operating handles) will have similar durability except where windows are to be installed in areas subject to particularly aggressive conditions, such as in coastal locations or near sources of industrial pollutants. In such areas, replacement of fittings may be necessary within the life of the window.

18.6 The gaskets and weatherstripping may need to be replaced within the life of the window.

19 Reuse and recyclability

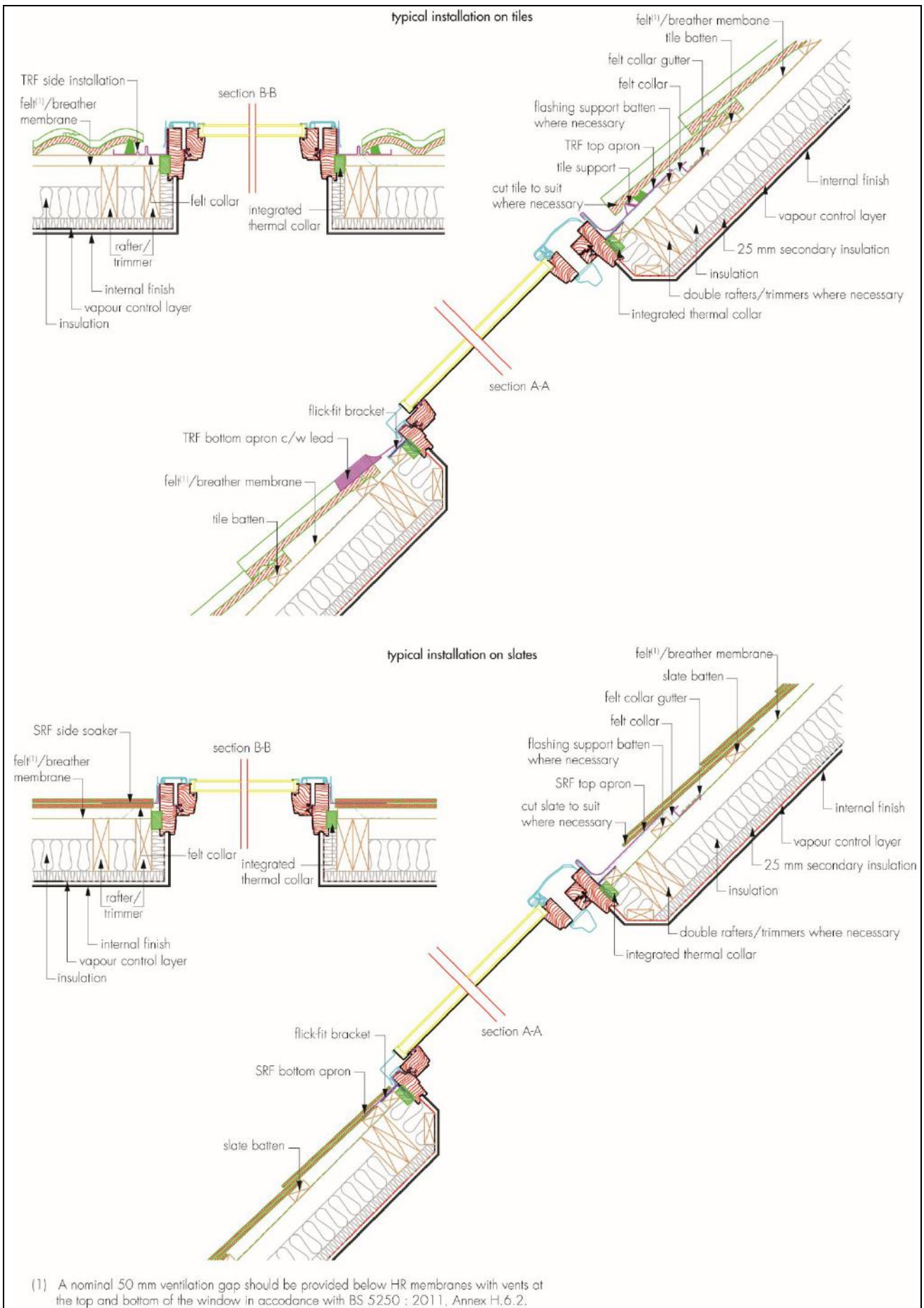
The timber frame members and aluminium cladding sections of the products can be recycled.

Installation

20 General

20.1 Keylite Centre Pivot Roof Windows with Integrated Thermal Collar must be fixed into the opening in accordance with the recommendations in the *Keylite Fitting Instructions for Roof Windows*, with the flick-fit zinc-plated mild steel mounting brackets screwed to the window frame and roofing battens. The window may be installed at any point above floor level (subject to Building Regulations approval), but consideration must be given to ease of operation. See Figure 5 for typical installations.

Figure 5 Typical window installation



20.2 With suitable propping, it is normally acceptable to cut out one rafter and form a trimmed opening. Where more extensive cutting of structural members is proposed, or in any case of doubt, a suitably qualified and experienced individual should be consulted.

20.3 When preparing the opening to accept the roof window, a tolerance of plus 40 mm should be allowed.

20.4 The positioning of the window depends on the type of roofing material. In the case of metal roof sheets or similar, the window must be installed above a horizontal lap. In the case of roofing materials with a depth of more than 45 mm (for example, pantiles, profiled sheets and corrugated fibre-cement sheets), the upper edge of the roofing material must be cut (tiles or slates) or blunt (metal roofing sheets or similar) under the edge of the window.

20.5 When installing the window, the distances between the edge of the window and roofing material shown in Table 5 must be maintained.

<i>Table 5 Installation details</i>	
Distance from edge of window (mm)	Distance from roofing material (mm)
Bottom edge	65 for slate (up to 8 mm thick) 100 for plain tiles 100 for flat tiles, and profile tiles up to 45 mm thick 120 to 140 for profiled tiles over 45 mm thick
Side	20 for slate 30 to 40 for plain tiles 55 to 65 for flat and profiled tiles
Top edge	60 to 150 for slate 50 to 100 for plain tiles 60 to 150 for tiles up to 45 mm thick 60 to 150 for tiles over 45 mm thick 60 to 150 for corrugated sheets

20.6 The window aperture should be marked on the roofing felt. When cutting away the roofing material, a 50 mm flap should be allowed all around to provide a waterproof damp proof membrane (dpm). The battens are cut out where the window is to be fitted.

20.7 The window is installed using the four pre-fitted flick-fit brackets. The optimum width spacing between the rafter facings should be the width of the window plus 40 mm. In the case of a roof having a different spacing between the rafters, additional timber bridging support must be provided.

20.8 The battens or roof boarding is cut where the window is to be fitted, to the width and height plus 40 mm.

21 Procedure

Preparation of the window

21.1 The timber packaging lath and aluminium cladding parts supplied with the window and the opening light frame are removed in accordance with the Certificate holder's instructions.

21.2 The mounting brackets, factory-fixed to the jambs of the outer frame, are flicked down in accordance with the Certificate holder's instructions.

Mounting the window on the roof

21.3 The outer frame is fitted into the prepared opening, and using a spirit level, ensuring that it lies flat and that the frame top is running parallel with the roofing rafter.

21.4 The top angle brackets are screwed onto the rafters; the opening light frame is fitted into the casing; and the lower angle brackets are screwed onto the rafters or battens, in accordance with the Certificate holder's instructions.

21.5 The roof tile underlay/dpc is secured around the sides of the roof window.

21.6 The thermal collar tape is released on all four sides and allowed to fully expand for 24 hours.

21.7 A vapour control layer is then mounted on the interior side of the installation.

21.8 Installation is completed by fixing appropriate covers and flashings in accordance with the Certificate holder's instructions.

Technical Investigations

22 Tests

22.1 Tests were carried out to determine:

- air permeability
- watertightness
- effect of wind loads
- efficiency of window fittings
- corrosion resistance of window fittings
- mechanical loading
- load bearing capacity of safety devices
- snow loading
- equivalent area
- ease of operation
- basic security.

22.2 The clear satin lacquer applied to the interior face was tested to determine:

- gloss retention after artificial weathering
- fungal resistance
- extensibility of applied film
- water vapour permeability
- abrasion resistance
- scratch resistance
- adhesion of coating.

22.3 The coil-coating on the aluminium covers was tested to determine:

- resistance to sulfur dioxide
- resistance to salt spray
- resistance to artificial weathering
- adhesion to substrate
- resistance to scratching.

22.4 Independent test data was examined relating to:

- air permeability
- watertightness
- effect of wind loads
- thermal transmittance
- aluminium cladding profiles.

23 Investigations

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

Bibliography

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- BRE Report BR 443 : 2006 *Conventions for U-value calculations*
- BS 6262-4 : 2018 *Glazing for buildings — Code of practice for safety related to human impact*
- BS 6375-1 : 2015 + A1 : 2016 *Performance of windows and doors — Classification for weathertightness and guidance on selection and specification*
- BS 8213-1 : 2004 *Windows, doors and rooflights — Design for safety in use and during cleaning of windows, including door-height windows and roof windows — Code of practice*
- BS EN 573-3 : 2013 *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Chemical composition and form of products*
- BS EN 1026 : 2016 *Windows and doors — Air permeability — Test method*
- BS EN 1027 : 2016 *Windows and doors — Watertightness — Test method*
- BS EN 1279-5 : 2018 *Glass in building — Insulating glass units — Product standard*
- BS EN 1991-1-3 : 2003 + A1 : 2015 *Eurocode 1 : Actions on structures — General actions — Snow loads*
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- BS EN 12207 : 2016 *Windows and doors — Air permeability — Classification*
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- BS EN 13141-1 : 2004 *Ventilation for buildings — Performance testing of components/products for residential ventilation — Externally and internally mounted air transfer devices*
- BS EN 14351-1 : 2006 + A2 : 2016 *Windows and doors — Product standard, performance characteristics — Windows and external pedestrian doorsets*
- BS EN ISO 10077-1 : 2017 *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — General*
- BS EN ISO 10077-2 : 2017 *Thermal performance of windows, doors and shutters — Calculation of thermal transmittance — Numerical method for frames*
- BS EN ISO 12567-2 : 2005 *Thermal performance of windows and doors — Determination of thermal transmittance by hot box method — Roof windows and other projecting windows*
- European Commission Decision 96/603/EC of 4 October 1996 *establishing the list of products belonging to Classes A 'No contribution to fire' provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products*
- TSO 2002 : *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings*

24 Conditions

24.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page – no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- 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.

24.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

24.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and 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.

24.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

24.5 In issuing this Certificate the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- 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
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

24.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal 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, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue 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.