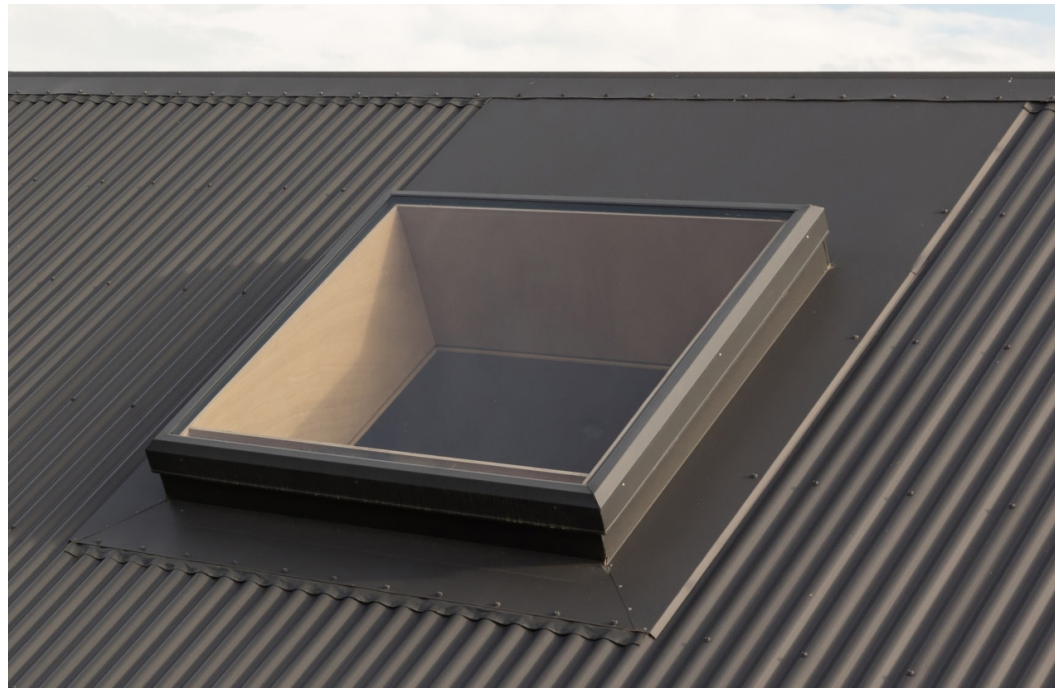




BRANZ Appraised
Appraisal No. 1178 [2021]

ADLUX ROOF WINDOWS

Appraisal No. 1178 [2021]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Adlux Roof Windows are for use on roofs of buildings with a roof pitch between 5° and 60° to provide natural light into interior spaces within buildings. Selected models of Adlux Roof Windows can also be used to provide ventilation. Adlux Roof Windows are available in a range of standard or custom sizes and can be supplied in any colour. Adlux Roof Windows are designed to be installed in raised [curb] mount applications and they are suitable for use with all roof types. They are supplied factory-glazed with double-glazed insulated glass units [IGUs].

Scope

- 2.1 Adlux Roof Windows [types RWA, RW, RWS and RWB] have been appraised for use on buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan area; and,
 - with roof structures designed and constructed to meet the requirements of the NZBC; and,
 - installed on a raised timber curb upstand with an installed pitch between 5° and 60°; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 Adlux Roof Windows must be installed in accordance with the Technical Literature supplied by Adlux Industries Ltd.



Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Adlux Roof Windows, if designed, used, installed, and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC.

Clause B1 STRUCTURE: Performance B1.3.1, B1.3.2 and B1.3.3. Adlux Roof Windows meet the requirements for loads arising from snow, wind and impact [i.e. B1.3.3 (g), (h) and (j)]. See Paragraphs 8.1-8.3.

Clause B2 DURABILITY: Performance B2.3.1 (b) 15 years. Adlux Roof Windows meet this requirement. See Paragraphs 9.1 and 9.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Adlux Roof Windows meet these requirements. See Paragraph 11.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. and F2.3.3 (a). Adlux Roof Windows meet these requirements.

Clause G4 VENTILATION: Performance G4.3.1 and G4.3.3 Adlux Roof Windows will contribute to meeting these requirements. See Paragraph 13.1.

Clause G7 NATURAL LIGHT: Performance G7.3.1 and G7.3.2. Adlux Roof Windows will contribute to meeting these requirements. See Paragraph 14.1.

Clause G9 ELECTRICITY: Performance G9.3.1. Adlux Roof Windows meet these requirements. See Paragraph 15.1.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 and H1.3.2E. Adlux Roof Windows will contribute to meeting these requirements. See Paragraphs 16.1-16.2.

Technical Specification

4.1 Adlux Roof Windows are a series of fixed and opening roof windows which includes the following types: Eco Skylight [RWA], Fixed Non-Vent [RW], Opening Sash Only [RWS] and Opening Sash & Base [RWB]. All Adlux Roof Windows are designed to be installed on a timber-framed curb upstand and have an installed pitch of between 5° and 60°.

4.2 Adlux Roof Window Frames for types RW, RWS and RWB are manufactured from factory powder-coated steel or 304 grade stainless steel finished in a dark grey colour referred to as 'flaxpod'. Alternative colours are available from Adlux Industries Ltd on request. See Paragraph 9.3 for further information regarding frame materials and corrosion zones.

4.3 Adlux Roof Window 'Eco Skylight' [type RWA] features Adlux 'Harmony' Glazing - argon-filled IGUs made with a tempered laminate low-emissivity toughened glass and are manufactured with an ABS plastic frame with a low-profile powder-coated steel or 304 grade stainless steel outer skin, finished in a dark grey colour referred to as 'flaxpod'. See Paragraph 9.3 for further information regarding frame materials and corrosion zones.

4.4 The Adlux Roof Window standard sizes covered by the Appraisal are:

Adlux Roof Window Types:	Size Code	Overall Dimension [mm]*
• Eco Skylight [RWA]	77	705 x 705
• Fixed Non-Vent [RW]	86	750 x 600
• Opening Sash Only [RWS]	99	910 x 910
• Opening Sash & Base [RWB]	106	1,030 x 600
	108	1,030 x 830
	128	1,230 x 830
	137	1,325 x 705
	148	1,450 x 830
	1,212	1,230 x 1,190
	1,313	1,315 x 1,315
	1,412	1,450 x 1,190

**Note: Overall dimensions are measured to the outside of the unit. Internal opening dimensions (daylight and fixing dimensions) can be found in the product Technical Literature and are variable depending on the roof window type selected.*

- 4.5 Adlux Roof Windows can alternatively be ordered in custom sizes of up to 1,200 mm wide by 2,400 mm tall for fixed [RWA/RW], and 1,200 mm wide by 1,500 mm tall for opening [RWS/RWB]. Units larger than those these have not been assessed by BRANZ and are outside the scope of this Appraisal.
- 4.6 Openable Adlux Roof Windows [RWS and RWB] come fitted as standard with a mechanism that allows the roof window to be opened using a supplied manual winding handle. Alternatively, in instances where access to manually wind the units is impractical or manual opening is undesirable, Adlux Roof Windows can be supplied fitted with a remote controlled mains or solar-powered opener to motorize the opening pane.
- 4.7 Adlux Roof Windows are factory-glazed using sealed double-glazed IGU's. The IGU's for all units include toughened glass to the outer pane and toughened or laminated glass to the inner pane as standard. In some cases, laminated safety glass to the bottom pane is required. See Paragraph 7.3 for more information. Refer to Adlux Industries Ltd for advice or confirmation of glazing if necessary.
- 4.8 Glazing units carry markings to show compliance with NZS 4223.4.
- 4.9 Flashings for all Adlux Roof Windows shall be detailed by the designer as appropriate for the building design with consideration to the information given NZBC Acceptable Solution E2/AS1 and the product Technical Literature. All flashings shall be fabricated, supplied and fitted by the roofing contractor.

Handling and Storage

- 5.1 Handling and storage of all Adlux Roof Windows components is under the control of the roof window installer. Components must be kept dry and under cover at all times. Care must be taken to avoid surface damage to the window components and flashings during the installation process.

Technical Literature

- 6.1 Refer to Adlux Industries Ltd for details of the current Technical Literature for Adlux Roof Windows. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

Design Information

General

- 7.1 Adlux Roof Windows are for use on roofs of new and existing buildings with an installed pitch between 5° and 60°. Installation of Adlux Roof Windows in roofs less than 5° require the raised curb upstand to be pitched at a minimum of 5°. Roof pitches above 60° are outside the scope of this Appraisal.
- 7.2 Adlux Roof Windows are suitable for installation in most existing timber-framed roofs. For such installations, it is important that the roof structure is checked by a suitably qualified person for structural adequacy and proposed weathertightness detailing to interface with the existing roof cladding.
- 7.3 Adlux Roof Windows are individually specified on a per-order basis to meet the safety glass requirements of NZS 4223.4 for sloped glazing. All Adlux Roof Windows meet the safety glass requirements of NZS 4223.4 for sloping overhead glazing at an installed height above floor level of not more than 5 m. Where the installed height shall be more than 5 m above the interior floor level, Adlux Roof Windows must be ordered featuring laminated safety glass to the lower [interior] pane. See Paragraphs 4.7 and 4.8. Refer to Adlux Industries Ltd for advice or confirmation of glazing material if necessary.
- 7.4 When installed on new roofs, whenever possible the installation should be carried out concurrently with the roof cladding installation.
- 7.5 Curb upstands to support the roof window shall be prepared in accordance with the Technical Literature supplied by Adlux Industries Ltd. Particular attention must be paid to the required opening size of the curb for the unit being installed, the width of the curb [nominally 45 mm wide] and the upstand height above surrounding roofing materials [110 mm minimum]. Roof flashings shall extend over the top face of the curb and form a flat bearing surface, allowing the closed cell foam compression seal factory fitted to the underside of the roof window to provide a weathertight seal to the curb once the unit is installed.
- 7.6 All Adlux Roof Windows are supplied pre-drilled for the installation of screw fixings to secure the unit to the curb upstand. Adlux Roof Windows are supplied with pre-coloured, galvanised Tek screws or stainless steel wood screw fixings of sufficient length and quantity to ensure adequate resistance against wind loads within the scope of this Appraisal.
- 7.7 Openable Adlux Roof Windows [RWS and RWB] can be supplied fitted with a remote controlled opener to motorize the opening pane. The electricity can be either supplied by a small solar panel fitted to the opener, or by a 24 vdc or 230 vac operator, which requires an external power source.

Structure

Wind

- 8.1 Adlux Roof Windows are suitable for use in NZS 3604 Wind Zones up to, and including, Extra High. The Wind Zone applicable to the site is to be advised to Adlux Industries Ltd at the time of ordering.

Snow

- 8.2 Adlux Roof Windows are suitable for use in areas where buildings are designed for a 1 kPa ground snow loading. The snow loading applicable to the site is to be advised to Adlux Industries Ltd at the time of ordering.

Point Loads

- 8.3 Adlux Roof Windows have not been tested for point loads from AS/NZS 1170. Because of the size of the windows, they should never be required to have a point load applied.

Durability

Serviceable life

- 9.1 Adlux Roof Windows are expected to have a serviceable life of at least 15 years, provided they are maintained in accordance with this Appraisal and the Technical Literature.
- 9.2 On exposure to the weather, the powder-coated exterior should be expected to gradually degrade in surface finish and gloss. A faster reduction in both surface finish and overall serviceable life can be anticipated in severe industrial, geothermal and marine exposures.
- 9.3 For areas defined by Section 4 of NZS 3604 as being exposure zone D, all Adlux Roof Windows shall be manufactured with 304 grade stainless steel frames. In all other corrosion zones, both powder-coated steel or stainless steel frames are suitable.

Maintenance

- 9.4 The glazing and external surfaces of Adlux Roof Windows can be cleaned using a mild, non-abrasive glass cleaner along with a soft brush or other non-abrasive applicator to maintain the clarity.
- 9.5 Roof flashings and weather seals within Adlux Roof Windows should be inspected annually for any signs of damage or deterioration. Any issues identified should be immediately repaired in consultation with a roofing contractor.
- 9.6 Keep all leaves clear from around Adlux Roof Windows and flashings. Ensure any exposed fasteners are secure. Inspect roofing and flashings for excessive wear or scratches on the roofing finish. Small scratches in the roof window finish may be fixed with touch up paint to match the original colour. Damaged claddings or flashings should be replaced as soon as they are detected.
- 9.7 The internal workings of the manual opening components and any optional electric components are considered maintenance free over the lifetime of the roof window. Mechanisms are pre-lubricated and need no additional lubrication.

Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to Adlux Roof Windows from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 11.1 Adlux Roof Windows, when installed in accordance with this Appraisal and the Technical Literature, will prevent the penetration of moisture that could cause undue dampness or damage to building elements.

Internal Moisture

- 12.1 Experience with double-glazed roof windows has shown that in normal domestic or similar applications, the windows do not pose a significant risk of condensation when correctly installed. Consideration should be given by the designer to providing an adequate combination of ventilation and heating to interior spaces to control condensation in conjunction with limiting sources of airborne moisture.

Ventilation

- 13.1 Some Adlux Roof Windows contain an openable aperture which will contribute to the compliance of a building with NZBC Clause G4. Consideration must be given to the 'net openable area' required for a particular space by the designer. NZBC Acceptable Solution G4/AS1 provides guidance on required ventilation.

Natural Light

- 14.1 Adlux Roof Windows all contain transparent apertures which can contribute to the compliance of a building with NZBC Clause G7. Consideration of the amount of illuminance provided by the roof window for a particular space will depend on a wide range of factors unique to each installation e.g. room size, position, sun orientation, angle, etc. The use of Adlux Roof Windows to supplement natural light from other sources is an Alternative Solution to NZBC Clause G7.

Electricity

- 15.1 The electrical installation and commissioning of Adlux Roof Windows fitted with electric openers that are connected to external power sources is required to be carried out by a Registered Electrician. Adlux Roof Windows fitted with solar-powered openers do not require an external power source and therefore do not require commissioning by a Registered Electrician. Solar-powered operators are factory-assembled and are screw fitted to the corresponding mounting brackets fitted to the roof window on-site by the contractor. The internal mechanisms of all openers within the range are maintenance free, however the battery cells of the opener and remotes can be periodically changed as and when required.

Energy Efficiency

- 16.1 Adlux Roof Windows have R-values that satisfy minimum requirements for skylights, achieving at least $R0.26 \text{ m}^2\text{K/W}$ as specified in NZBC verification method H1/VM1 and NZBC Acceptable Solution H1/AS1. Where the total area of roof windows exceeds 1.5 m^2 or 1.5% of the total roof area [whichever is the greater], the calculation or modelling methods of NZS 4218 must be used for building designs.
- 16.2 Specific R-values of Adlux Roof Windows have not been assessed. Thermal modelling of specific unit sizes, materials and glazing configurations can be undertaken to determine accurate thermal values if desired. Specific values for thermal performance of Adlux Roof Windows have not been assessed by BRANZ and are outside the scope of this Appraisal.

Installation Information

Installation Skill Level Requirements

- 17.1 The installation of Adlux Roof Windows must be completed by installers trained by Adlux Industries Ltd, or by competent, experienced tradespersons with an understanding of roof window installation and weathertightness details. The installation must be in accordance with the Technical Literature and this Appraisal.

System Installation

- 18.1 Installation must be completed in accordance with instructions given in the Adlux Roof Windows Technical Literature and this Appraisal.

Health and Safety

- 19.1 There are no particular health and safety issues relating to the installation or use of Adlux Roof Windows. Installers must however observe safe working practices for working with glass on roofs and at heights.



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BRANZ

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

20.1 Adlux Roof Windows have been subjected to dynamic weather resistance testing by BRANZ.

Investigations

- 21.1 Adlux Roof Windows have been assessed for resistance to impact loads, snow loads and resistance to wind pressures [non-cyclonic regions]. These assessments have been reviewed by BRANZ and were found to be satisfactory.
- 21.2 An assessment was made of the durability of Adlux Roof Windows by BRANZ.
- 21.3 The roof window units have been assessed for thermal resistance by BRANZ experts.
- 21.4 Site inspections have been carried out by BRANZ to assess fitness for purpose and the practicability of installation, and to assess in service performance.
- 21.5 Instructions for installation of units and design guidance for associated flashing components for different roof types has been reviewed and found to be satisfactory.
- 21.6 The Technical Literature for Adlux Roof Windows has been examined by BRANZ and found to be satisfactory.

Quality

- 22.1 The manufacture of Adlux Roof Windows has been examined by BRANZ and found to be satisfactory.
- 22.2 The quality of materials, components and accessories supplied to the market is the responsibility of Adlux Industries Ltd.
- 22.3 Quality of installation on-site of Adlux Roof Window components and accessories is the responsibility of the installer.
- 22.4 Designers are responsible for building design, and specification of natural lighting and ventilation systems.
- 22.5 Building owners are responsible for any required maintenance of Adlux Roof Windows in accordance with the advice of Adlux Industries Ltd.

Sources of Information

- AS/NZS 1170: Structural design actions.
- NZS 3604: 2011 Timber-framed buildings.
- NZS 4223.4: 2016 Code of practice for glazing in buildings - Dead, wind and snow loading.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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24 May 2021

ADLUX ROOF WINDOWS



In the opinion of BRANZ, **Adlux Roof Windows** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **Adlux Industries Ltd**, and is valid until further notice, subject to the Conditions of Appraisal.

Conditions of Appraisal

1. This Appraisal:
 - a) relates only to the product as described herein;
 - b) must be read, considered and used in full together with the Technical Literature;
 - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
 - d) is copyright of BRANZ.
2. **Adlux Industries Ltd**:
 - a) continues to have the product reviewed by BRANZ;
 - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
 - c) abides by the BRANZ Appraisals Services Terms and Conditions;
 - d) warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
 - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
 - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
 - c) any guarantee or warranty offered by **Adlux Industries Ltd**.
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to **Adlux Industries Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

24 May 2021