BRANZ Appraised
Appraisal No. 968 [2023]

VELUX SKYLIGHTS

Appraisal No. 968 (2023)

This Appraisal replaces BRANZ Appraisal No. 968 (2017)

BRANZ Appraisals

Technical Assessments of products for building and construction.

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Product

1.1 Velux Skylights are for use on roofs to provide natural light into interior spaces within buildings. Velux Skylights come in two ranges – low-pitch models include the FCM, VCM and VCS series, suitable for use on roof pitches between 0° and 60°, and FS, VS, VSE and VSS series which are for use with roof pitches between 15° and 60°. Some models are openable and can be used to provide ventilation.

Scope

2.1 Velux Skylights (FS, VS, VSE and VSS series) have been appraised for use on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regard to building height and maximum floor plan area; and,
- with roof structures designed and constructed to meet the requirements of the NZBC; and,
- with masonry tile, pressed metal tile, and profiled metal roof cladding systems complying with NZBC Acceptable Solution E2/AS1; and,
- with a roof pitch between 15° and 60°; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High.

2.2 Velux Low-Pitch Skylights (FCM, VCM and VCS series) have been appraised for use on buildings within the following scope:

- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regard to building height and maximum floor plan area; and,
- with roof structures designed and constructed to meet the requirements of the NZBC; and,
- with pitched roof cladding types and profiles and minimum pitches as specified in E2/AS1; or,
- for use on flat or nominally flat roofs making use of membrane roof systems; and,
- with a roof pitch between 0° and 60°; and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Velux Skylights, 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. Velux Skylights 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. Velux Skylights meet this requirement. See Paragraphs 9.1 and 9.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Velux Skylights meet these requirements. See Paragraph 12.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1 and F2.3.3 (a). Velux Skylights meet these requirements. See Paragraph 7.3.

Clause G4 VENTILATION: Performance G4.3.1 and G4.3.3. Openable Velux Skylights contribute to meeting these requirements. See Paragraph 14.1.

Clause G7 NATURAL LIGHT: Performance G7.3.1 and G7.3.2. Velux Skylights contribute to meeting these requirements. See Paragraph 15.1.

Clause G9 ELECTRICITY: Performance G9.3.1. Velux Skylights meet this requirement. See Paragraph 16.1.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 and H1.3.2E. Velux Skylights contribute to meeting these requirements. See Paragraph 17.1.

Technical Specification

4.1 Velux Skylights (FS, VS, VSE and VSS series) are a range of fixed and opening skylights which are manufactured from preservative treated softwood frames and sashes, finished on the interior faces with a white semi-gloss paint. External cappings are 'grey friars' coloured PVDF lacquered aluminium.

4.2 Velux Low-Pitch Skylights (FCM, VCM and VCS series) are a range of fixed and opening low-pitch skylights which are finished on the interior faces with a white semi-gloss paint. The FCM Low-Pitch Skylight has an aluminium frame to the perimeter of the insulated glazing unit and an integral rubber gasket to seal the unit to the curb. The VCM and VCS Low-Pitch Skylights have aluminium frames and sashes with white PVC interior frames. External cappings for Velux Low-Pitch Skylights are aluminium. All aluminium components of Velux Low-Pitched Skylights are pre-finished with a 'grey friars' coloured PVDF lacquer. Velux Low-Pitch Skylights are primarily suited for use with roof membranes and wide-profile metal roofing. Flashings and roof detailing for Velux Low-Pitch Skylights must be specifically designed in all instances.

4.3 The Velux Skylight models covered by this Appraisal are:

- FS / VS / VSE / VSS:
  - Size code range C01-S06, dimension range 550 x 700 mm–1,140 x 1,180 mm.
- FCM:
  - Size code range 1430-4646, dimension range 488 x 895 mm–1,302 x 1,302 mm.
- VCM / VCS:
  - Size code range 2222–4646, dimension range 692 x 692 mm–1,302 x 1,302 mm.

Glazing

4.4 VELUX Skylights are factory glazed using sealed double-glazed insulating glass units (IGU's). The IGU's are Type 04 which is the product code on the packaging and is marked on the IGU itself on the spacer bar between the glazing and on the glass panes.

4.5 Type 04 units comprise either a 3 or 3.9 mm thick toughened outer pane with a low emissivity (Low-E) coating, a 9 mm argon-filled cavity and a 5.36 mm thick inner pane of laminated toughened safety glass. The outer pane has a coating which is designed to reduce the buildup of dirt and ease cleaning.

4.6 The units carry markings to show compliance with American National Standards Institute Standard ANSI Z97.1.

Flashings

4.7 EDW, EDL and EKW Flashings are a range of Kynar 500 painted aluminium flashings designed for use with Velux Skylights (FS, VS, VSE and VSS series). Flashings and roof detailing for the Low-Pitch Skylight must be specifically designed and are outside the scope of the Appraisal.

Handling and Storage

5.1 Handling and storage of all components of Velux Skylights is under the control of the skylight installer. Components must be kept dry and under cover at all times. Care must be taken to avoid surface damage to the skylight components and flashings during the installation process.

Technical Literature

6.1 This Appraisal must be read in conjunction with:

- Technical Manual - Velux Skylights and Roof Windows - New Zealand - Product: Skylights - April 2020.

6.2 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 Velux Skylights are for use on roofs to provide natural light into interior spaces within buildings. Velux Skylights come in two ranges, low-pitch models include the FCM, VCM and VCS series, suitable for use on roof slopes between 0° and 60°. The FS, VS, VSE and VSS series are appraised with roof slopes between 15° and 60°. Installation of Velux Skylights on roofs with other pitches is outside the scope of this Appraisal and their installation must be specifically designed in all instances.

7.2 Velux Skylights are suitable for 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 suitability of the existing roof cladding.

7.3 Velux Skylights meet the safety glass requirements of NZS 4223.4 for sloped glazing up to an installed height above floor level of not more than 5 m *(Note: The installed height means the height to the highest part of the glazing).*

7.4 When installed on new roofs, whenever possible, the installation should be carried out concurrently with the roof cladding installation.

Structure

Wind

8.1 Velux Skylights are suitable for use in NZS 3604 Wind Zones up to, and including, Extra High.

Snow

8.2 Velux Skylights are suitable for use in areas where buildings are designed for a 1 kPa snow loading.

Point Loads

8.3 Velux Skylights have been assessed for point loads from AS/NZS 1170 for situations where supports should be placed over the surface when access is necessary.

Durability

Serviceable life

9.1 Velux Skylights 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 coil-coated aluminium may gradually lose the original surface finish. A faster reduction in both surface finish and overall serviceable life can be anticipated in severe industrial, geothermal and marine exposures.

Maintenance

10.1 The internal surface of the glazing on Velux Skylights can be simply cleaned from inside the building where reasonable access is provided. The exterior glass surface of Velux Skylights can only be cleaned from the exterior of the building.

10.2 The glazing and external surfaces of the skylights can be cleaned using a mild, non-abrasive glass cleaner along with a soft brush or other non-abrasive applicator to maintain the surface appearance.

10.3 Interior surfaces of Velux Skylight models VSE, VS and FS with pre-finished wood frames need to be inspected annually. As with any finished surface, it is subject to peeling, cracking or fading and will need to be re-finished/re-painted periodically. To re-finish/re-paint the skylight interior wood surfaces, prepare the skylight by removing the factory finish.

10.4 Keep all leaves clear from around Velux Skylights. Ensure all exposed fasteners are secure. Inspect roofing and flashing for excessive wear or scratches on the roofing finish. Scratches in the cladding finish may be fixed with touch-up paint available through Velux New Zealand Ltd. Damaged claddings or flashings should be replaced as soon as they are detected.

10.5 The internal workings of the manual and the Integra electric operators are considered maintenance free over the lifetime of the Velux Skylight. Mechanisms are pre-lubricated and need no additional lubrication. The chains and hinges should be checked and lubricated as required.

Prevention of Fire Occurring

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

External Moisture

12.1 Velux Skylights, 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

13.1 Experience with double-glazed skylights has shown that in normal domestic or similar applications, the windows do not pose a significant risk of condensation when correctly installed.

Ventilation

14.1 Velux Skylights which contain an openable aperture 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

15.1 Velux Skylights 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 skylight 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 Velux Skylights to supplement natural light from other sources is an Alternative Solution to NZBC Clause G7.

Electricity

16.1 Where a new electrical supply is required for Velux opening skylights, the installation must be completed by a Registered Electrician in accordance with New Zealand Electrical Code of Practice NZECP 51.

16.2 Electrical safety of the electric skylight operator complies with IEC 60335.

Energy Efficiency

Velux Schedule Method

17.1 The Velux Schedule Method may be used as an alternative solution to the Schedule Method contained in the NZBC Acceptable Solution H1/AS1 for housing, and other buildings up to 300 m^2 in floor area. The Velux Schedule Method requires that:

- the sum of the vertical glazing area and the Velux product area (Velux skylights, roof windows and sun tunnels) is 30% or less of the total wall area; and
- the combined glazing area on the east, south, and west facing walls is 30% or less of the combined total area of these walls; and
- the Velux product area is no more than 1.5 m^2 or 1.5% of the total roof area (whichever is greater); and
- the opaque door area is no more than 6 m^2 or 6% of the total wall area (whichever is greater); and
- the roof, wall, floor, window and door glazing R-values are in accordance with section 2.1.2 of NZBC Acceptable Solution H1/AS1.

Calculation and Modelling Methods

17.2 Alternatively, designers can use the calculation methods contained in NZBC Acceptable Solutions H1/AS1 or H1/AS2, or the modelling methods contained in NZBC Verification Methods H1/VM1 or H1/VM2. Contact Velux New Zealand Ltd for the relevant product R-values.

Installation Information

Installation Skill Level Requirement

18.1 The installation of Velux Skylights must be completed by installers trained by Velux New Zealand Ltd or by competent, experienced tradespersons with an understanding of roof window installation and weathertightness details.

System Installation

19.1 Installation must be completed in accordance with instructions given in the Velux Skylights Technical Literature and this Appraisal.

Health and Safety

20.1 There are no particular health and safety issues relating to the installation or use of Velux Skylights. Installers must however observe safe working practices for working on roofs and at heights.

Basis of Appraisal

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

Tests

21.1 Velux Skylights have been subjected to dynamic weather resistance testing by a National Association of Testing Authorities [NATA] registered laboratory in Australia. Velux Skylights have also been subjected to dynamic weather resistance testing by BRANZ.

Other Investigations

22.1 Velux Skylights 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.

22.2 An assessment was made of the durability of Velux Skylights by BRANZ.

22.3 The Velux Schedule Method has been reviewed by BRANZ experts.

22.4 Site inspections have been carried out by BRANZ to assess fitness for purpose and the practicability of installation, and to assess in service performance.

22.5 Weathertightness detailing of the Velux Skylights has been assessed by BRANZ and found to be satisfactory. Instructions for installation of units and associated flashing components for different roof types have also been reviewed and found to be satisfactory.

22.6 The Technical Literature for Velux Skylights has been examined by BRANZ and found to be satisfactory.

Quality

23.1 The manufacture of Velux Skylights has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory. BRANZ has taken note of Uniform Evaluation Service [UES] Evaluation Report Number 199 which covers quality aspects associated with Velux Skylights. BRANZ has also taken note of ETA Denmark European Technical Assessment ETA-13/0764 of 14/10/2015 which covers Velux Flashings.

23.2 The quality of materials, components and accessories supplied to the market is the responsibility of Velux New Zealand Ltd.

23.3 Quality of installation on-site of Velux Skylight components and accessories is the responsibility of the installer.

23.4 Designers are responsible for building design, and specification of natural lighting and ventilation systems.

23.5 Building owners are responsible for any required maintenance of Velux Skylights in accordance with the advice of Velux New Zealand Ltd.

Sources of Information

- ANSI Z97.1:2015 For safety glazing materials used in buildings - safety performance specifications and methods of test.
- AS 4285:1995 Skylights.
- AS/NZS 1170.0:2002 Structural design actions - Permanent, imposed and other actions.
- IEC 60335 Household and similar electrical appliances - safety.
- NZECP 51:2004 New Zealand Electrical Code Of Practice For Homeowner/Occupier's Electrical Wiring Work in Domestic Installations, Ministry of Economic Development, 2004.
- 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.

BRANZ

In the opinion of BRANZ, Velux Skylights 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 Velux New Zealand 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. Velux New Zealand 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 Velux New Zealand 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 Velux New Zealand Ltd or any third party.

For BRANZ

Claire Falck
Chief Executive
Date of Issue:
21 August 2023