Fixed Self-Flashed (QPF) Unit Skylight - Guide Specification

For over 80 years, VELUX has been delivering energy efficient daylight to living spaces where people, live, work, and play. VELUX is the world leader in harnessing the benefits of the sun, providing energy efficient top lighting solutions, and recognized as one of the strongest brands in the global materials and home improvement industry.

VELUX QPF skylight systems are designed for residential sloped roof applications. Daylighting provided through VELUX skylights improves the energy efficiency and visual comfort of these residential spaces. The VELUX QPF skylight system is a category leader with a maintenance free frame, structural seal, and durable thermal pane options with performance levels meeting project specifications. The thermal pane glazing options carry a 20 year warranty against seal failure, and have specially formulated LoE^3 – 366™ and LoE^3 – 340™ coatings. This coating, specifically designed for skylight applications, provides a high visible light transmission while reducing solar heat gain and UV penetration.

VELUX test facilities ensure that new products comply with regulations and market demands for technical performance. VELUX testing ensures that our products are able to withstand the most difficult climatic conditions to which VELUX products are typically exposed to in the markets where they are sold. Our test procedures include load capacity, air and water tightness in a test chamber and a weather simulator, mechanical tests, impact test results, durability tests, U-factor and solar heat gain tests, burn brand resistance and visual inspection of the surface quality.

Contact **VELUX America LLC**., Greenwood, SC 29648; www.VELUXusa.com; 800-888-3589, specifications@veluxusa.com.

SECTION 08 62 00 –UNIT SKYLIGHTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fixed self-flashed unit skylight with extruded aluminum pan flashing for mounting on roof decks for low-slope and steep-slope roofing applications.

1.2 REFERENCE STANDARDS

Specifier: If retaining optional "References" article, edit to include standards cited in edited Section.

A. General: Applicable edition of references cited in this Section is current edition published on date of issue of Project specifications, unless otherwise required by building code in force.

B. American Architectural Manufacturers Association (www.aama.net), Window & Door Manufacturers Association (www.wdma.com), Canadian Standards Association (www.csagroup.org/us/en/services)

1. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/ Specification for Windows, Doors, and Skylights (NAFS)
2. CSA A440S1-19 – Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440
3. AAMA 2603 – Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum and Panels

C. ASTM International: www.astm.org:
1. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
2. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings
3. ASTM E 283 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
4. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
5. ASTM E 408 - Standard Test Methods for Total Normal Emittance of Surfaces Using Inspection-Meter Techniques
6. ASTM E 1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials
7. ASTM E 1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes

D. Code of Federal Regulations:

1. 29 CFR 1910.29 (e) (1) - Occupational Safety and Health Standards for Fall Protection Systems and Falling Object Protection – Criteria and Practices.

E. Illuminating Engineering Society of North America (IESNA): www.ies.org:

1. IESNA – The Lighting Handbook.

F. National Fenestration Rating Council: www.nfrccommunity.org:

1. NFRC 100 - Procedure for Determining Fenestration Product U-factors
2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site prior to delivery of unit skylight and installation of roof deck.

1.4 ACTION SUBMITTALS

A. Product Data: For unit skylights. Include standard construction details, product performance characteristics, and material descriptions, dimensions of individual components and profiles, and finishes.

1. Include test reports of qualified independent testing agency or third party certificates verifying compliance with performance requirements.

Specifier: Retain "LEED Submittals" Paragraph when required for Project; this Paragraph stipulates documentation required from Contractor to support cited construction-phase credits.

Review design-phase credits available related to unit skylights, including contribution to IEQ Cr 6.1 Controllability of Systems, IEQ Cr 8.1. Daylighting, EA Cr 1 Energy Optimization, and ID Cr 1 Innovation in Design credits. Consult VELUX representative for detailed support data.

B. LEED Submittals:

1. Credit MR 4 Recycled Content: Documentation indicating the following:

a. Percentages by weight of post-consumer and pre-consumer recycled content.
b. Total weight of products provided.
c. Include statement indicating costs for each product having recycled content.

C. Shop Drawings: For unit skylight work. Include plans, elevations, sections, details, and connections to supporting structure and other adjoining work.

1.5 INFORMATIONAL SUBMITTALS

Specifier: Retain paragraphs below when Project requirements include compliance with Federal Buy American provisions. VELUX Fixed Self-Flashed unit skylights complies with requirement.

A. Florida State Product Approval Listing Number: Indicating that products comply with requirements of Florida State Building Code. www.floridabuilding.org/pr/pr_app_srch.aspx

B. Warranty: Sample of special warranty.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data.

1.7 QUALITY ASSURANCE

Specifier: VELUX America, LLC. has been producing skylights in the US for over 40 years and in Europe for an additional 40 years prior to that. VELUX has a reputation among architects and contractors as the most reliably performing skylight in the world.

A. Manufacturer Qualifications: A qualified manufacturer listed in this Section with minimum 30 years' experience in the US manufacturing similar products in successful use on similar projects and able to provide unit skylights meeting requirements.

Specifier: Retain "Approval of Manufacturers and Comparable Products" Subparagraph if Owner will consider product substitutions.

1. Approval of Manufacturers and Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:

    a. Completed and signed Substitution Request form.
    b. Product data, including photometric data and independent test data indicating compliance with requirements.
    c. Sample product warranty.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of unit skylights that fail in materials or workmanship under normal use within specified warranty period.

    1. Failures include, but are not limited to, the following:

        a. Deterioration of metals, metal finishes, dome, and other materials beyond normal weathering.
        b. Breakage of glazing.

2. Warranty Period:

a. Unit Skylight and Flashing Product Warranty: 10 years from date of purchase.
b. Hail Breakage Warranty for Skylight Glass: 10 years from the date of purchase on all insulated glass units using laminated glass.
c. Insulating Glass Seal Failure Warranty: 20 years from date of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide products of **VELUX America LLC**., Greenwood, SC 29648; www.VELUXusa.com; (800) 878-3589, specifications@veluxusa.com.

Specifier: Retain "Substitutions" Paragraph and select one of two options based upon Project requirements.

B. Substitutions: [None allowed by Owner] [As permitted under Instructions to Bidders and Section 012500 "Substitution Procedures"].

C. Source Limitations: Obtain unit skylights through single source from single manufacturer.

2.2 Fixed Self-Flashed (QPF) Unit Skylights

A. System Description: Fixed self-flashed unit skylight with a pre-finished white wooden frame, roll-formed aluminum frame cover joined by corner keys, an interior condensation drainage gasket, an insulated glass unit, an extruded aluminum pan flashing, structural sealant, mounting fasteners, and accessories, as required to meet installation and performance requirements indicated. QPF skylights are manufactured with a preinstalled shade and shall be suitable for installation on roof decks ranging from 10 degrees up to 60 degrees from horizontal.

1. Basis of Design: **VELUX America, LLC, Model QPF Fixed Self-Flashed Skylight**.

Specifier: **QPF** standard unit sizes are not available as a stocked product for all glazing options. Custom sizes not Available.

B. Aluminum Frame Cover: Maintenance-free, roll-formed aluminum, 15 gauge, 0.06 inch (1.5 mm) thick with neutral grey Kynar® 500 polyvinylidene fluoride resin finish. Counter-flashing frames joined with neutral grey corner keys constructed from injection molded Acrylonitrile Styrene Acrylate (ASA)-Luran.

1. Unit Sizes: [2222], [2230], [2246], [3030], [3046], [4646], [as indicated on Drawings].

C. Condensation Drainage Gasket: Factory applied black thermoplastic rubber gasket mounted around the entire interior aluminum frame assembly providing a thermal break weather seal and drainage for interior condensation.

D. Wood: Kiln-dried, laminated Ponderosa Pine and Eastern White Pine, pre-finished white. Wood shall be Forest Stewardship Council (FSC) certified or have an FSC certified chain of custody certification.

E. Insulated Glass Unit: Factory assembled with low emissivity exterior pane and clear interior pane separated by a stainless steel spacer sealing the space between panes with 90% argon gas.

F. Pan Flashing: Extruded 14 gauge (1.7 mm) aluminum with neutral gray powder coat finish.

Specifier: Retain 0.125 inch thick pane for QPF sizes less than 4646, and for QPF size 4646 retain 0.16 inch thick pane. Retain "Neat® exterior coating" when specifying laminated interior pane.

1. Exterior Pane: [0.125 inch (3mm)] [0.16 inch (4mm)] thick tempered glass with [Neat® exterior coating and] interior surface coated with three layers of low emissivity silver (LoE^3) coating [LoE^3 366][LoE^3 340].

Specifier: Retain one of the three interior pane options below. VELUX product codes list the tempered interior pane as 05 and 15 glazing. Laminated panes are listed by VELUX as 04 and 14 with clear interlayer, 08 "White laminated" with white interlayer. VELUX offers two interior pane options for wind-borne debris regions. The wind-borne debris laminated interior pane with standard polyvinyl butyral interlayer is listed by VELUX as an impact 06 and 16 glazing for use in wind zone 4 regions requiring a class D missile level. Laminated panes are typically required by building codes when any portion of the glass is higher than 12 feet above finished floor. VELUX laminated panes are marketed as "Clean, Quiet and Safe" glass.

2. Interior Pane:
   a. [Tempered, Clear 0.125 inch (3mm) tempered glass.]
   b. [Standard Laminated, Two clear 0.090 inch (2.3 mm) heat-strengthened panes with a 0.030 inch (0.76 mm) [clear] [white] polyvinyl butyral interlayer sandwiched together.]
   c. [Impact Laminated for wind-borne debris regions, Two clear 0.090 inch (2.3 mm) heat-strengthened panes with a 0.090 inch (2.3 mm) clear polyvinyl butyral interlayer sandwiched together.]

G. Structural Sealant: Factory applied silicone sealant, black color, bonding the glass pane to the aluminum frame and suitable for external exposure.

H. Shade: Solar powered, room darkening double pleated polyester fabric with white color. 24 volt dc shade operated via 2.4 GHz radio frequency basic wall mounted remote control provided.

Specifier: QPF skylights supplied with 26 mounting fasteners for all sizes.

I. Mounting Fasteners: 10 gauge 1.25 inch (32 mm), ring shank nails provided with skylight. Ring shank nails are double hot dipped zinc coated. The field installed nails secure skylight to roof deck as indicated in manufacturer's installation instructions.

2.3 ACCESSORIES

A. Controls:
1. KLR 300 VELUX Touch remote. Controls all shades from one touchscreen remote.
2. VELUX App Control. Controls and schedules shades with smart device.

2.4 PERFORMANCE REQUIREMENTS

A. Unit Skylight Standard, QPF 4646 or smaller unit with tempered coated exterior glass pane and interior pane as follows:
AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS-17 or previous):

1. Design Pressure (DP):
   a. [Laminated with 0.030 inch (0.76 mm) Interlayer: DP = +325/-90 psf (+15.6/-4.31 kPa)]
   b. [Tempered: DP = +325/-90 psf (+15.6/-4.31 kPa)]
   c. [Laminated with 0.090 inch (2.3 mm) PVB Interlayer: DP = +240/-100 psf (+11.5/-4.79 kPa)]

2. Water Test Pressure: 15 psf (0.72 kPa) with no leakage at 5 gallons per minute spray rate.
3. Air Leakage Rate: 0.04 cfm/ft^2 maximum.
4. Canadian Air Infiltration/Exfiltration Rating: Fixed. (0.2 L/s/m^2 maximum)

B. [Windborne-Debris Resistance: Wind Zone 4 or Less: Provide unit skylights capable of resisting impact from windborne debris, based on the pass/fail criteria as determined from testing glazed representative of those specified, according to ASTM E 1886 and ASTM E 1996. Missile Level D, Wind Zone 4 requirements, and +50/-50 psf cycle pressure minimum.]

C. Fire Ratings for Roof Assemblies with Fire Classifications: Unit skylight tested in accordance with ASTM E 108 and listed as passing Burning Brand test with target classification of Class B.

D. Energy Performance ratings for any size fixed unit skylight with tempered exterior glass pane and interior pane as follows:

Specifier: Retain the appropriate option in the 3 paragraphs below that corresponds to the type of insulated glass unit used on Project.

1. Thermal Transmittance: NFRC 100 maximum U-factor:

a. [Clear Standard Laminated using 0.030 inch (0.76 mm) Interlayer: 0.41 Btu/hr*ft2*deg F (2.34 W/m2*deg C).]
b. [LoE^3 - 366 exterior pane with interior tempered: 0.41 Btu/hr*ft2*deg F (2.34 W/m2*deg C).][LoE^3 – 340 exterior pane with interior tempered: 0.42 Btu/hr*ft2*deg F (2.36 W/m2*deg C).]
c. [LoE^3 – 366 exterior pane with interior impact laminated using 0.090 inch (2.3 mm) PVB Interlayer: 0.39 Btu/hr*ft2*deg F (2.24 W/m2*deg C).][LoE^3 – 340 exterior pane with interior impact laminated using 0.090 inch (2.3 mm) PVB Interlayer: 0.40 Btu/hr*ft2*deg F (2.28 W/m2*deg C).]
d. [White Standard Laminated using 0.030 inch (0.76 mm) Interlayer: 0.41 Btu/hr*ft2*deg F (2.30 W/m2*deg C).]

2. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum SHGC for [LoE^3 366] [LoE^3 340]

a. [LoE^3 – 366 exterior pane with interior clear standard laminated using 0.030 inch (0.76 mm) Interlayer: 0.22][LoE^3 – 340 exterior pane with interior clear standard laminated using 0.030 inch (0.76 mm) Interlayer: 0.15]
b. [LoE^3 - 366 exterior pane with interior tempered: 0.22]][LoE^3 – 340 exterior pane with interior tempered: 0.15]
c. [LoE^3 – 366 exterior pane with interior impact laminated using 0.090 inch (2.3 mm) PVB Interlayer: 0.22][LoE^3 – 340 exterior pane with interior impact laminated using 0.090 inch (2.3 mm) PVB Interlayer: 0.18]
d. [LoE^3 – 366 exterior pane with interior white standard laminated using 0.030 inch (0.76 mm) Interlayer: 0.15]

3. Visible Transmittance (Vt): NFRC 200 maximum Vt for [LoE^3 366][LoE^3 340]:

a. [LoE^3 – 366 exterior pane with interior clear standard laminated with 0.030 inch (0.76 mm) Interlayer: 0.51][LoE^3 – 340 exterior pane with interior clear standard laminated using 0.030 inch (0.76 mm) Interlayer: 0.31]
b. [LoE^3 - 366 exterior pane with interior tempered: 0.52]][LoE^3 – 340 exterior pane with interior tempered: 0.31]
c. [LoE^3 – 366 exterior pane with interior impact laminated using 0.090 inch (2.3 mm) PVB Interlayer: 0.52][LoE^3 – 340 exterior pane with interior impact laminated using 0.090 inch (2.3 mm) PVB Interlayer: 0.31]
d. [LoE^3 – 366 exterior pane with interior white standard laminated using 0.030 inch (0.76 mm) Interlayer: 0.46]

E. Fall Protection Standard Compliance: 29 CFR 1910.29: Testing for all laminated fixed unit skylights.

2.5 MATERIALS

A. Aluminum Sheet: Flat sheet complying with ASTM B 209/B 209M.

B. Joint Sealants: As specified in Section 079200 "Joint Sealants."

C. Mastic Sealants: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

2.6 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with unit skylight installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install unit skylights in accordance with manufacturer's written instructions and approved shop drawings. Coordinate installation of units with installation of substrates, air and vapor retarders, roof insulation, roofing membrane, and flashing as required to ensure that each element of the Work performs properly and that finished installation is weather tight.

1. Anchor unit skylights securely to supporting substrates.
2. Install unit skylights on roof decks specified in another section with tops of skylights parallel to finished roof slope.

B. Where metal surfaces of unit skylights will contact incompatible metal or corrosive substrates, including preservative-treated wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation recommended in writing by unit skylight manufacturer.

C. Additional testing and inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

D. Prepare test and inspection reports.

3.3 CLEANING AND PROTECTION

A. Clean exposed unit skylight surfaces according to manufacturer's written instructions. Touch up damaged metal coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

B. Replace glazing that has been damaged during construction period.

C. Protect unit skylight surfaces from contact with contaminating substances resulting from construction operations.

END OF SECTION