



Venting Deck Mount (VS/E/S) 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 manual (VS), electric (VSE), and solar (VSS) venting deck mount skylights 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 VS/E/S skylight 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 a specially formulated LoE³ - 366™ coating. 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.

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SECTION 08 62 00 -UNIT SKYLIGHTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Venting deck mount unit skylight with formed counter flashing for mounting on the roof deck, 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 COORDINATION

- A. Coordinate unit skylight interior termination locations with structural layout, ceiling grid layouts, and other ceiling-mounted items.

1.4 PREINSTALLATION MEETINGS

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

1.5 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. Lighting photometric study indicating compliance with performance requirements in accordance with IESNA. Include layout, spacing criteria and foot-candle report.

1.6 INFORMATIONAL SUBMITTALS

Specifier: Retain paragraphs below when Project requirements include compliance with Federal Buy American provisions. VELUX Venting Deck Mount 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.

1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data.

1.8 QUALITY ASSURANCE

Specifier: VELUX America, LLC. has been producing skylights in the US for over 30 years and in Europe for an additional 30 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.

1.9 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. Unit Skylight and Flashing Installation “No Leak” Warranty: 10 years from date of purchase.
- c. Hail Breakage Warranty for Skylight Glass: 10 years from the date of purchase on all insulated glass units using laminated glass.
- d. 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 Venting Deck Mounted [Manual Unit Skylight (VS)][Electric Unit Skylight (VSE)][Solar Unit Skylight (VSS)] Skylights

- A. System Description: Venting deck mounted unit skylight consisting of the following main integrated components – an interior condensation drainage gasket, pre-finished white wooden frame [Special order stain grade wooden frame available on request], exterior maintenance-free [aluminum] [copper] cladding/counter flashing, ASA corner keys, and an insulating thermal pane glass unit with two seals, warm edge spacer system, three coats of LoE³ silver to increase visible light transmittance while reducing solar heat, and a continuous deck seal mounting system with durable foam seal. VS/E/S skylights shall be suitable for installation on roof decks ranging from 14 degrees up to 85 degrees from horizontal.

- 1. Basis of Design: **VELUX America, LLC, Model [VS][VSE][VSS] Venting Deck Mount Skylight.**

Specifier: **VS/E/S** standard unit sizes are not available as a stocked product for all glazing options. Custom sizes not available. Size M02 for VSS and VS only. Stain grade for VSS and VS only. Copper cladding for VSE and VS only.

- B. Wood: Kiln-dried, laminated Ponderosa Pine and Eastern White Pine [pre-finished white] [stain grade]. Wood shall be Forest Stewardship Council (FSC) certified or have an FSC certified chain of custody certification.
- C. Maintenance free exterior cladding: [Roll formed 0.57 mm aluminum frame coverings with neutral gray Kynar[®] polyvinylidene fluoride resin finish,] [0.55 mm copper frame coverings,] production engineered, and fabricated to fit exterior exposed surfaces.

1. Unit Sizes: [C01], [C04], [C06], [C08], [M02], [M04], [M06],[M08], [S01], [S06][as indicated on Drawings].
- D. Operator for Opening and Closing Skylight:
1. [Manual operator (VS) with hook for in-reach or out-of-reach applications (VS).]
 2. [Electric operator (VSE) requiring 120 volts, 40 watts, 60 Hz rating, integral rain sensors and assembly that uses a robust chain driven system to open the skylight 11 inches. A 2.4 GHz radio frequency remote control pad is standard component with each VSE.]
 3. [Solar operator (VSS) powered by a solar charged battery operator. Battery pack is a 9 cell Panasonic NiMH 10.8V, 2100 mA. 60 Hz rating assembly that uses a robust chain driven system to open the skylight 11 inches. Skylight provided with integral photovoltaic cells and rain sensor. A 2.4 GHz radio frequency remote control pad is standard component with each VSS.]
- E. Weather stripping: Factory applied neoprene and thermoplastic elastomeric weather stripping throughout entire frame, profiled to effect weather seal.
- F. 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.
1. Exterior Pane: 0.125 inch (3mm) thick tempered glass with Neat® exterior coating and interior surface coated with three layers of low emissivity silver (LoE³) coating LoE³ 366.

Specifier: Retain one of the three interior pane options below. VELUX product codes list the standard laminated pane as 04 with heat strengthened interior panes using a clear interlayer. VELUX offers an interior pane option for wind-borne debris regions. The wind-borne debris laminated interior pane with a thicker polyvinyl butyral interlayer is listed by VELUX as an impact 06 glazing for use in wind zone 3 regions requiring a class C missile level. A snow load laminated interior pane is offered with the laminated panes being tempered. 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. [Standard [with i89 coating]: Laminated, Two clear 0.090 inch (2.3 mm) heat-strengthened panes with a 0.030 inch (0.76 mm) clear polyvinyl butyral interlayer sandwiched together.] [interior pane surface with Indium Tin Oxide (ITO) coating (LoE-i89® coating)]
 - b. [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.]
 - c. [Snow Load: Laminated, Two clear 0.12 inch (3 mm) tempered panes with a 0.030 inch (0.76 mm) clear polyvinyl butyral interlayer sandwiched together.]
- G. Structural Sealant: Factory applied Instant glaze sealant, clear color, bonding the glass pane to the aluminum frame and suitable for external exposure.

- H. Mounting System: Continuous corrosion resistant mounting system with a durable foam seal and rough opening alignment notches.

Specifier: VS/E/S skylight supplied 26 mounting fasteners.

- 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 Flashings

Specifier: Type EDL step flashing designed for use with roofing material less than 0.5 inch (13 mm) thick (typically asphalt shingles, cedar shingles and slate) and for use on roof slopes 14 degrees or greater and not more than 85 degrees. Type EDW high profile flashing designed for use with high profiled roofing materials (clay tile, concrete tile and cedar shakes) not greater than 4.75 inches (120 mm) in height, and for use on roof slopes 14 to 85 degrees. EDL or EDW flashing is required with skylight in order for VELUX 10 year "No Leak" warranty to be valid.

- A. Step Flashing: Roll formed aluminum, neutral grey finish, factory engineered and fabricated seams, consisting of head flashing, sill flashing, step flashing pieces and adhesive underlayment suitable for use on roof pitches 14 to 85 degrees from horizontal.

1. Basis of Design: **VELUX America, LLC, EDL Step Flashing.**
2. Size: As required for skylight sizes indicated.
3. Material:
 - a. Head flashing 23 gauge (0.57 mm) thick aluminum with polyester lacquer finish.
 - b. Sill flashing 22 gauge (0.65 mm) thick aluminum with Kynar 500 finish.
 - c. Step pieces 27 gauge (0.42 mm) thick aluminum with polyester lacquer finish.
 - d. Adhesive underlayment: 9 inches (229 mm) wide x 21 feet (6.4 m) length x 0.03 inch (0.8 mm) thick, SBS modified bitumen with white polyethylene backing sheet.

- B. High Profile Flashing: Roll formed aluminum, neutral grey finish, factory engineered and fabricated seams, consisting of head flashing, sill flashing, side gutter pieces, counter flashing and adhesive underlayment suitable for use on roof pitches 14 to 85 degrees from horizontal.

1. Basis of Design: **VELUX America, LLC, EDW High Profile Flashing.**
2. Size: As required for skylight sizes indicated.
3. Material:
 - a. Head flashing 23 gauge (0.57 mm) thick aluminum with polyester lacquer finish.
 - b. Sill flashing 22 gauge (0.65 mm) thick aluminum with polyester lacquer finish and 9 inch (229 mm) pleated apron.
 - c. Side gutter pieces 23 gauge (0.57 mm) thick aluminum with polyester lacquer finish.

- d. Adhesive underlayment: 12 inches (305 mm) width x 21 feet (6.4 m) length x 0.03 inch (0.8 mm) thickness, SBS modified bitumen with white polyethylene backing sheet.

2.4 ACCESSORIES

- A. Pleated Blinds:
Solar powered, [room darkening double pleated] [light filtering single pleated] fabric with [white] [beige] [special] color as indicated on drawings. 24 volt dc blinds operated via 2.4 GHz radio frequency [basic wall mounted remote control provided with blind].
- B. VELUX Active:
Indoor climate control and monitoring system for use with VELUX skylights and blinds.
- C. Power supplies and electric controls are available but sold separately.
 - a. [KLB 100 Battery backup for VSE]
 - b. [[KLI 310 Wall mounted keypad for use with [VSS] [VSE]]
 - c. [[KLF 200 Home automation integration kit and signal repeater for use with [VSS] [VSE]]
 - d. [ZMT 300 6-10' motorized rod for VS]
- B. Manual Controls for VS are available but sold separately.
 - a. [ZCT 300 6-10' telescopic rod]
 - b. [ZCT 100 3' extension to ZCT 300 or ZMT 300]
 - c. [ZZZ 201 Crank handle]
 - d. [ZZZ 203 Angle adaptor for chain operator]

2.5 PERFORMANCE REQUIREMENTS

- A. The [VS][VSE][VSS] deck mounted skylight is independently tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS-17) for compliance with International Building Code, International Energy Conservation Code and International Residential Code as follows:
 - 1. Water Test Pressure: No water penetration noted as measured in accordance with ASTM E 331 with a test pressure differential of 720 Pa (15.0 psf).
 - 2. Air Leakage Rate: Maximum of 0.05 CFM/ft² of total unit area, measured at a pressure of 75 Pa (1.57 psf) in accordance with ASTM E 283.
 - 3. Canadian Air Infiltration/Exfiltration Rating: A3. (0.3 L/s/m² maximum)
 - 4. Design Pressure (DP):
 - a. [[04 Standard Laminated Pane] [89 standard Laminated Pane with i89 Coating]: [S06 and S01 sizes design pressure = +300/-65 psf (+14.4/-3.11 kPa)] [and] [M08 and smaller sizes design pressure = +400/-105 psf (+19.2/-5.03 kPa)].]
 - b. [[06 Impact Pane: [S06 and S01 sizes design pressure = +200/-65 psf (+9.58/-3.11 kPa)] [and] [M08 and smaller sizes design pressure = +230/-65 psf (+11.0/-3.11 kPa)].]
 - c. [[10 Snow Load Pane: [S06 and S01 sizes design pressure = DP = +800/-80 psf (+38.3/-3.83 kPa)] [and] [M08 and smaller sizes design pressure = +1150/-150 psf (+55.1/-7.18 kPa)] [and] [C06 and smaller sizes design pressure = +1300/-150 psf (+62.2/-7.18 kPa)].]

- B. Daylighting: Provide daylighting photometric performance comparable to basis of design product at layout indicated, based upon daylighting profile of March 21, 9:00 am local time, at Project location by simulation in accordance with IESNA guidelines.
- C. [Windborne-Debris Resistance: Wind Zone 3 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 C, Wind Zone 3 requirements, and +50/-50 psf cycle pressure minimum.]
- D. 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.
- E. Energy Performance ratings for any size venting deck mounted 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. [04 Standard Laminated: 0.43 Btu/hr*ft²*deg F (2.49 W/m²*deg C).]
 - b. [06 Impact Laminated: 0.41 Btu/hr*ft²*deg F (2.36 W/m²*deg C).]
 - c. [89 Standard Laminated with i89 Coating: 0.38 Btu/hr*ft²*deg F (2.16 W/m²*deg C).]
 - d. [10 Snow Load Laminated: 0.42 Btu/hr*ft²*deg F (2.4 W/m²*deg C).]
- 2. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum SHGC:
 - a. [04 Standard Laminated: 0.23]
 - b. [06 Impact Laminated: 0.23]
 - c. [89 Standard Laminated with i89 Coating: 0.22]
 - d. [10 Snow Load Laminated: 0.23]
- 3. Visible Transmittance (Vt): NFRC 200 maximum Vt:
 - a. [04 Standard Laminated: 0.53]
 - b. [06 Impact Laminated: 0.53]
 - c. [89 Standard Laminated with i89 Coating: 0.52]
 - d. [10 Snow Load Laminated: 0.52]

- F. Fall Protection Standard Compliance: 29 CFR 1910.29: Testing for all laminated venting deck mount unit skylights.

2.6 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.

2.7 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 curbs specified in another section with tops of curbs 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