

VELUX America Inc.
SPECIFICATION FOR MODEL FCM
FIXED CURB MOUNT SKYLIGHT
SECTION 08620 – UNIT SKYLIGHTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance and product component information for VELUX® FCM curb mount fixed skylight.
- B. Unit skylight mounted on [prefabricated] [site-built] curbs.
- C. Engineered flashings [ECL for shingle and thin roofing material] [ECW for high profile roofing material].

1.02 REFERENCE STANDARDS

- A. *ASTM E 283 – Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specific Pressure Differences Across the Specimen.*
- B. *ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.*
- C. *ASTM E 331 – Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.*
- D. *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.*
- E. *ASTM E 1996 – Standard Specifications for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.*
- F. *National Fenestration Rating Council, NFRC 100, Procedure for Determining Fenestration Product U-factors.*
- G. *National Fenestration Rating Council, NFRC 200, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.*
- H. *National Fenestration Rating Council, NFRC 300, Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems.*

- I. Occupational Safety & Health Administration, OSHA Standards – 29 CFR 1910.23, *Guarding Floor Openings and Holes*.
- J. TAS 201-94, Standard Impact Test Procedures
- K. TAS 202-94, Standard Criteria for Testing Impact and Non Impact Resistant Building Envelope Components using Uniform Static Air Pressure Loading.
- L. TAS 203-94, Standard Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.

1.03 SYSTEM DESCRIPTION

- A. Skylight: Fixed curb mount skylight that consists of five integrated components - an interior condensation drainage gasket, an insulating glass unit, exterior structural sealant, roll-formed aluminum frame counter flashing with ASA corner keys.
- B. Configuration: Fixed unit, curb mounted
- C. Condensation Control: Integral internal condensation collection system and drainage slots
- D. Accessories available but sold separately:
 - A. Accessory tray for the mounting of accessories (available as an accessory ZZZ 199)
 - B. Light block shades available in 24 v dc electric or solar powered variants.
 - C. Roller shade available in 24 v dc electric or solar powered variants
 - D. Venetian blinds available in 24 v dc electric.
- E. Manual controls are available but sold separately.
 - a. Six – ten feet manual telescopic rod
 - b. Six – ten feet motorized telescopic rod
- F. Power supplies and electric controls are available but sold separately.
 - a. KLR 100 radio frequency remote control
 - b. KLC 500 accessory power supply (controls up to five accessories).

- c. KLI 110 wall-mounted control keypad

1.04 PERFORMANCE REQUIREMENTS

- A. The FCM curb mount skylight is independently tested in accordance with listed standards for compliance with the unit skylight provisions of the 2003, 2006 and 2009 IBC, IECC, and IRC as follows:
 - a. AAMA/WDMA/CSA 101/I.S.2/A440-05 (NAFS-05) and AAMA/WDMA/CSA 101/I.S.2/A440-08 (NAFS-08)

Performance Grades must be greater than or equal to:
 - i. Downward design pressure = 170 psf
 - ii. Uplift Design Pressure = 70 psf
 - b. AAMA/WDMA/CSA 101/I.S.2 (NAFS-02)

Rated pressures must be greater than or equal to:
 - i. Downward design pressure = 150 psf
 - ii. Uplift Design Pressure = 85 psf
- B. Air leakage: Maximum of 0.2 l/s/m² (0.04 CFM/ft²) of total unit area, measured at a differential pressure of 75 Pa (1.57 psf) in accordance with ASTM E 283, per the NAFS standards in (A).
- C. Water infiltration: No water penetration noted as measured in accordance with ASTM E 331 with a test pressure differential of 720 Pa (15.0 psf). Exceeds requirements of NAFS standards in (A).
- D. Thermal Performance: U-factor = 0.51 Btu/hr*ft²*F° or less, SHGC = 0.26 or less and [Vt = 0.52 or greater (clear)] or [Vt = 0.39 (white)]. Tested and certified in accordance with NFRC 100 and 200 procedures. 2010 ENERGY STAR® qualified in all U.S. zones.
- E. FCM skylights with impact glazing (06): Tested and certified in accordance with ASTM E 1886 and ASTM E 1996, Cycle Pressure +50/-50, Missile Level D, Wind Zone 3.
- F. FCM skylights with impact glazing (07): Tested and certified in accordance with approved Miami-Dade County Test Proposal #09-1669, Design Pressure rating of +70/-70 psf.
- G. Limit member deflection to flexure limit of glass with full recovery of glazing materials.

- H. System accommodates, without damage to components or deterioration of seals, movement between and frame and curb.

1.05 SUBMITTALS

- A. Product Data: Manufacturer's installation details and product data sheets include:
 - a. Preparation details and installation instructions
 - b. Product Data sheets with storage and handling information
 - c. Architectural roof sectional drawings can be found at www.VELUXusa.com
 - d. Code compliance information can be found within these specifications, or by contacting VELUX at 800-888-3589, or by visiting www.VELUXusa.com
- B. Architectural/Cross Sectional Drawings
 - a. Mounting details
 - b. Frame sizes
 - c. Flashing details
- C. Shop Drawings
 - a. Indicate material types, gauge, finishes, and installation details
- D. Maintenance Data: For unit skylights (unit skylight flashing system) (sunscreening accessories) to be included in maintenance manuals
- E. Warranty: Sample of warranty or special warranty

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - a. Skylight manufacturer shall have a minimum of ten years experience in design and fabrication of curb mount glass skylights.
 - b. Skylights shall be manufactured to the highest standards of quality and craftsmanship in ISO 9001 and ISO 14001-certified facilities.

- c. Flashings shall be engineered and manufactured to match up with the roofing material and skylight.
- B. Source Limitations: Obtain unit skylights, flashings, and accessories from a single source and from a single manufacturer.
 - a. Electrical Components, Devices, and Accessories: Listed and labeled by a qualified testing agency as defined in NFPA 70, and marked for intended location and application.
 - b. Unit Skylight Standard: Comply with AAMA/WDMA 101/I.S.2./NAFS, *North American Fenestration Standard Voluntary Performance specifications for Windows, Skylights and Glass Doors*, and all later editions, for minimum standards of performance, materials, components, accessories, and fabrication. Comply with more stringent requirements if indicated.
 - c. Provide third party certified unit skylights with attached labels.
 - d. Thermal Performance – rated per applicable NFRC procedures.
 - i. Provide NFRC-certified unit skylight ratings on an attached label.
 - ii. Qualify under ENERGY STAR criteria in all 50 states and carry a verifying label.
 - e. Manufactured to the highest standards of quality and craftsmanship in accordance with VELUX Manufacturing Standards.

1.07 COORDINATION

- A. Coordinate unit skylight flashing requirements with roofing system.
- B. Coordinate size and locations of site built curbs with actual unit skylights provided.
- C. Pre-installation conference: conduct conference at (project site).

1.08 WARRANTY

- A. Standard VELUX product warranty, as specified in VELUX Warranty, publication XUS 20194.

1.09 DELIVERY, HANDLING, STORAGE

- A. Deliver products in manufacturer's original containers dry and undamaged, with seals and labels intact.

- B. Store and protect products in accordance with manufacturer's recommendations.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Acceptable Manufacturer: VELUX America Inc., P.O. Box 5001, Greenwood, SC 29648; Toll Free Tel: 800-888-3589; Fax: 800-388-1329; Web: www.VELUXusa.com
- B. Substitutions: Not permitted

2.02 MATERIALS

- A. Maintenance-free Exterior Aluminum Frame and Covers: Roll-formed 15 gauge, 1.5-mm (0.06") thick, prefinished neutral gray, production engineered and fabricated to fit.
- B. Field Fasteners: (Skylight frame to curb) #8 x 1-3/4" Stainless steel self-drill screw (# per skylight as indicated in manufacturer's installation instructions).
- C. Dual sealed Glazing
 - a. Dual sealed thermal pane with warm edge technology, 95% argon gas fill, and with three layers of LoE³ silver that increases visible light over standard low-e coatings while lowering the solar heat gain. The following glazing options are available:
 - i. 04 – Tempered LoE³ pane over a laminated heat strengthened interior pane with 0.030" interlayer.
 - ii. 05 – Tempered LoE³ pane over tempered pane.
 - iii. 06 – Tempered LoE³ pane over a laminated heat strengthened interior pane with 0.090" PVB interlayer.
 - iv. 07 - Tempered LoE³ pane over a laminated heat strengthened interior pane with 0.090" SGP interlayer.
 - v. 08 – Tempered LoE³ pane over a laminated heat strengthened interior pane with 0.030" white interlayer.
 - vi. 10 – Tempered LoE³ pane over a laminated tempered interior pane with a 0.030" interlayer to achieve higher snow load ratings.
- D. Weather stripping: Factory applied neoprene and thermoplastic elastomeric weather stripping around entire frame, profiled to effect weather seal.

2.03 Flashing options

- A. Type ECL Flashing is an engineered prefabricated step flashing system, designed for use with roofing materials less than 3/4" thick and for slopes 10 to 60 degree.
- B. Type ECW Flashing is an engineered prefabricated gutter flashing system, designed for use with high profiled roofing materials, and for slopes 14 to 60 degrees.
- C. Custom flashing provided by others for applications where ECL and ECW flashings are not suitable.

2.04 FABRICATION

- A. Fabricated one piece aluminum counter flashing system with corner keys.
- B. Provide internal drainage of glazing spaces with exterior through gasketing to remove condensation.
- C. All units are factory glazed with structural silicone-based primary seal.
- D. Site-built curb (or prefabricated curb) required.
- E. ECL and ECW aluminum flashing available, but site-built fabricated flashings can be installed.

2.05 FINISHES

- A. Exterior surfaces: Maintenance-free roll-formed aluminum frame with neutral gray Kynar® 500 polyvinylidene fluoride resin finish.
- B. Maintenance-free flashing: Roll-formed aluminum, neutral gray, baked on polyester polyamide primer and finish coats.
- C. Interior surface: Provided by others, other than glass.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify curb and rough opening dimensions, squareness, roof pitch, and proper orientation of skylight.

3.02 INSTALLATION

- A. Install skylight in accordance with manufacturer's installation instructions and local code requirements.

- B. Align skylight with curb, free of warp or twist, maintaining dimensional tolerances.
- C. Attach skylight to curb with screws furnished by manufacturer.
- D. Coordinate attachment and seal of perimeter air and vapor barrier material.
- E. Provide insulation of the curb for maximum energy efficiency.
- F. Install manufacturer's prefabricated engineered flashing in accordance with manufacturer's installation instructions to achieve weather tight installation.
- G. Install sunscreening products and electrical or manual controls.

3.03 Cleaning

- A. Clean exposed skylight according to manufacturer's written instructions. Touch up damage to metal coatings and finishes.
- B. Remove excess sealants, dirt, and other substances.
- C. During the construction process, protect the skylight surfaces from contact with contaminants.

3.04 Field Quality Control

- A. Install skylight, flashing, and accessories in accordance with manufacturer's installation instructions.