



Commercial Dome Unit Skylight - Guide Specification

For over 70 years, VELUX has been delivering energy efficient daylight to indoor 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 is recognized as one of the strongest brands in the global materials and home improvement industry.

VELUX thermoformed dome skylights are designed for commercial roof applications and are available in custom sizes to meet unique needs for each project. Daylighting provided through VELUX skylights improves the visual comfort of these spaces and enables the operations manager to achieve maximum energy savings when daylight sensors and automated lighting controls are incorporated into the daylighting design.

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

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

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SECTION 08 62 00 –UNIT SKYLIGHTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Dome unit skylight with curb counterflashing and easy carry extruded frames that come attached to specified curb, or that are prepared for mounting on site-built or prefabricated roof curbs, for flat, low-slope and steeper-slope roofing applications.

1.2 RELATED REQUIREMENTS

[Specifier: If retaining optional "Related Sections" article, edit to include sections applicable to Project.](#)

- A. Section 061053 "Miscellaneous Rough Carpentry" for site-built wood roof curbs and nailers for unit skylights.
- B. Division 07 roofing section for flashing and roofing terminations at unit skylight curbs.
- C. Section 077200 "Roof Accessories" for manufactured metal roof curbs for unit skylights.

1.3 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)
- C. ASTM International: www.astm.org:
 - 1. ASTM D1003 – Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics
 - 2. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings
 - 3. ASTM E283 - 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 D635: Standard Test Method for Rate of Burning and/or Extent and time of Burning of plastics in a horizontal position
 - 5. ASTM D1929: Standard Test Method for Determining Ignition Temperature of Plastics
 - 6. ASTM D2843: Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics
- D. Code of Federal Regulations:
 - 1. 29 CFR 1910.23 (e) (8) - Occupational Safety and Health Standards for Walking-Working Surfaces to Guard Floor and Wall Openings and Holes

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

1.4 COORDINATION

[Specifier: Retain option in paragraph below that corresponds to the type of curb used on Project.](#)

- A. Coordinate dimensions, locations, and details of skylight curbs [specified in Section 061053 "Miscellaneous Carpentry"] [specified in Section 077200 "Roof Accessories"] with unit skylight curb flashings. Verify requirements for roofing system terminations.
- B. Coordinate unit skylight interior termination locations with structural layout, ceiling layouts, and other ceiling-mounted items.

1.5 PREINSTALLATION MEETINGS

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

1.6 ACTION SUBMITTALS

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

1.7 INFORMATIONAL SUBMITTALS

[Specifier: Retain paragraphs below when Project requirements include compliance with Federal Buy American provisions. VELUX Fixed Curb Mount skylights complies with requirement.](#)

- A. Buy American Act Certification: Submit documentation certifying that products comply with provisions of the Buy American Act 41 U.S.C 10a – 10d.
- B. Warranty: Sample of special warranty.

1.8 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data.

1.9 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.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of 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 polycarbonate glazing.
 - c. Product leaks.
 2. Warranty Period: Refer to VELUX Warranty for details
 - a. 15 Years: Polycarbonate skylights (Models CT- and CG-) will be free from defects in material, workmanship, and that no water will leak through the installed VELUX polycarbonate skylights.
 - b. 10 Years: Yellowing polycarbonate skylight domes.
 - c. 5 Years: Aluminum curbs (Model CCAM and CCAN), external safety cage, internal safety screen accessory, internal security bars accessory, and ventilation curb extension will be free from defects in material and workmanship.
 - d. 1 Year: Steel curbs.

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.

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 DOME UNIT SKYLIGHT (Model CT2[CG2])

A. System Description: Thermoformed dome, curb mounted fixed skylight utilizing extruded aluminum frame counter-flashing with welded corners, an interior 100% thermally broken gasket for condensation drainage, structural sealant, and accessories, as required to meet installation and performance requirements indicated. Thermoformed dome skylights shall be suitable for installation on roof curbs ranging from 0 degrees up to 60 degrees from horizontal.

1. Basis of Design: **VELUX America LLC, Model CT2 [CG2] Custom Dome Skylight.**

Specifier: The Custom Thermoformed Dome Skylight glazing is sized to meet the specific unit skylight requirements. Prismatic sheets are not offered for the outer dome as prisms pointed away from sun refract as much as 10% the light to the exterior resulting in less daylight passing through the prismatic material. Prismatic sheets used for the inner dome where the prisms point to the light source allows all the daylight to pass through and fully diffuses the light as intended.

These custom unit skylights are designed and manufactured to meet the particular conditions skylights are intended to experience at different geographic locations. VELUX refers to polycarbonate dynamic domes as LuxGuard, and the LuxGuard polycarbonate sheets have an integrated enhanced spectral protection layer (UV blocking) that insures long-term color and performance stability. The product program is designed around flexibility to meet the needs of the project and designed to provide a high quality lower cost unit skylight to meet the needs of the project. To meet this objective, unit skylights are made with the appropriate glazing thickness to meet the load requirements of the specified sizes of unit skylights. This reduces product cost but makes it impossible to provide performance data for the variety of glazing layers available for this product platform. Therefore, performance values for the individual glazing materials are listed but this does not represent complete unit skylight product performance.

Model CT2 is a double dome skylight with mill finish aluminum frame. Model CG2 is a double dynamic dome skylight with neutral gray powder coat finished aluminum frame.

Use white color interior smooth or prismatic dome when specifying 100% light diffusion.

B. Thermoformed Dome: outer dome formed from smooth sheet and not prismatic in order to transmit all incident daylight through outer dome. Provide polycarbonate outer domes with integral UV blocking cap layer that prevents long-term yellowing, and insures material strength and performance stability.

1. Double dome: (LuxGuard) – Outer dome [clear] [white] polycarbonate with UV blocking cap layer. Inner dome prismatic polycarbonate, color [clear] [white]. [Light diffusion 100%.]

Specifier: Custom dome skylights are custom sized in ¼" increments and are made on demand.

- C. Aluminum Frame Counter-flashing: Maintenance-free, extruded aluminum, grade 6063-T5, 0.06 inch (1.5 mm) thick with [mill] [neutral grey powder coat] finish. Counter-flashing frames completely welded in corners and counter flashes the curb to a minimum of 1.625 inches (41 mm). Includes a 0.75" (19 mm) continuous ledge for ease of shipping and manual handling.
 - 1. Unit Sizes: [as indicated on Drawings].
- D. 100% Thermally Broken Gasket for Condensation Drainage: Factory applied black thermoplastic gasket encapsulates the entire interior aluminum frame assembly providing a thermal break weather seal and drainage for condensation. The gasket design allows positive condensation to the exterior of the curb without exposed drainage openings in the aluminum frame that can introduce air infiltration into the skylight. The thermally broken gasket construction allows for a dry installation of skylight to the curb, eliminating weather seal strips or caulking at the top of the curb.
- E. Structural Sealant: Factory applied silicone sealant, gray color, bonding the dome to the aluminum frame and suitable for external exposure.

2.3 CURBS:

A. Aluminum Curbs:

- 1. Factory insulated double wall aluminum curb, 1.5 inches in thickness with 20-gauge mill finished aluminum exterior and 22-gauge mill finished aluminum interior. Curb factory insulated with 1.5 inches of polyisocyanurate board providing an R-value of 8.5. Width and length of curb shall be [2448] [2496] [24120] [3636] [3660] [3672] [3696] [4848] [4860] [4872] [4896] [6060] [6072] [6096] [as indicated on Drawings] with [9] [12] [16] inch curb height. Curb roof mounting flange shall be a minimum 2.75 inches in width. Basis of Design: VELUX America LLC, Model CCAM.
- 2. Factory insulated single wall aluminum curb, fabricated from 14-gauge mill finish aluminum with fully welded corners. Nominal 1 inch by 4 inch wood nailer mounted under the top flange of the curb. Curb wall insulated with ¾ inch thick rigid polyisocyanurate insulation factory mounted to the curb exterior providing a R-Value of 4.2. Width and length of curb shall be [2448] [2496] [24120] [3636] [3660] [3672] [3696] [4848] [4860] [4872] [4896] [6060] [6072] [6096] with [9] [12] [16] inch curb height. Curb roof mounting flange shall be a minimum 2.75 inches in width. Basis of Design: VELUX America LLC, Model CCAN.
- 3. Ventilated curb extender: Single wall curb extender constructed from 12-gauge mill finish aluminum with fully welded corners. Natural ventilation is provided by two 4 inch wide by 3.5 inch high aluminum louvered opening per foot of length along each side. The curb extender mounts on a standard 1.5 inch thick curb. Aluminum rain guard shall be provided preventing casual rain from reaching interior spaces. Width and length of curb extender shall be [4848] [4896] with 6.5 inch height. Basis of Design: VELUX America LLC, Model CAV xxxx.

- B. Steel Curb: Curb width and length designation shall be [2448] [2496] [24120] [3636] [3660], [3672] [3696] [4848] [4860] [4872] [4896] [6060] [6072] [6096]. Curb height shall be [9] [12] [16] [18] inches and nominal curb thickness shall be 1.5 inches.

Specifier: VELUX recommends fall protection. All steel curbs provided with integral safety screen, unless indicated otherwise. Curbs are available without safety screens or security bars, but must be specified with no safety screen or security bars.

1. Factory Insulated Curb: Factory engineered steel curb fabricated from [18] [14] gauge galvanized steel with fully welded corners, all welds factory primed with galvanized paint, and continuous 2 inch by 2 inch nominal pressure treated wood nailer mounted to the top flange of the curb. Curb is factory insulated with 1.5 inch thick, 3 pound density fiberglass insulation. Interior liner of curb fabricated from 20 gauge steel and primed white. Curb roof mounting flange shall be a minimum of 3 inches in width. [Provide steel curb without safety screen or security bars.] [Steel insulated curb provided with integral [fall protection safety screen constructed from 0.1875 inch steel mesh with a 6 inch on center grid spacing] [security bars constructed from 0.5 inch cold rolled steel with a 6 inch on center grid spacing]]. Basis of Design: VELUX America LLC Model, CCA3.
2. Non-insulated curb: Factory engineered steel curb fabricated from [18] [14] gauge galvanized steel with fully welded corners, all exterior welds factory primed with galvanized paint, and continuous 2 inch by 4 inch nominal pressure treated wood nailer mounted under the top flange of the curb. Curb roof mounting flange shall be a minimum of 3 inches in width. [Provide steel curb without safety screen or security bars.] [Steel insulated curb provided with integral [fall protection safety screen constructed from 0.1875 inch steel mesh with a 6 inch on center grid spacing] [security bars constructed from 0.5 inch cold rolled steel with a 6 inch on center grid spacing]]. Basis of Design: VELUX America LLC, Model CCA6.

Specifier: Aluminum curb shipped separate from skylight or pre-attached to skylight.

2.4 FALL PROTECTION AND SECURITY ACCESSORIES

- A. Interior safety screen accessory: Fall protection safety screen constructed from 0.1875 inch steel mesh with a 6 inch on center grid spacing welded to 18 gauge steel z-bar support frame continuous on each side with welded corners. Interior safety screen frame mounts to top of 1.5 inches curb with safety screen mesh located not more than 1.5 inches below top of curb. Safety screen factory primed with white finish. Safety screen shall meet fall protection requirements by supporting a minimum load of 400 pounds on any one square foot. Interior safety screen accessory width and length designation shall be [2448] [2496] [24120] [3636] [3660] [3672] [3696] [36120] [4848] [4860] [4872] [4896] [48120] [6060] [6072] [6096] [60120] [as indicated on drawing]. Basis of Design: VELUX America LLC, Model CRGA xxxx ICD.
- B. Exterior safety screen accessory: Fall protection screen attaches directly to the skylight frame and provides fall protection coverage over the exterior of the skylight dome. Safety screen constructed from a minimum 0.1875 inches steel mesh with a 4 inch on center grid spacing. Exterior safety screen shall meet fall protection requirements by supporting a minimum load of 400 pounds on any one square foot. Safety screen accessory width and length designation shall be [2448] [2496] [24120] [3636] [3660] [3672] [3696] [36120] [4848] [4860] [4872] [4896] [48120] [6060] [6072] [6096] [60120]. Basis of Design: VELUX America LLC, Model CAE.

2.5 PERFORMANCE REQUIREMENTS

- A. Unit Skylight Standard, Thermoformed Dome model [CT-] [CG-] tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 (NAFS-11) as follows:
 1. Design Pressure (DP): Minimum DP = 35 psf (+16.8 KPa).

2. Negative Design Pressure = -45 psf (-21.6 KPa).
 3. Air Leakage Rate: Maximum 0.01 cfm/ft² (0.1 L/s/m²)
- 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. Air Infiltration: Maximum air leakage through tested size of 0.01 cfm/sq. ft. (0.1 L/s/sq. m) of fixed area as determined according to ASTM E 283 at a static-air-pressure differential of 1.57 lbf/sq. ft. (75Pa.)
 - D. Fire Testing for Roof Assemblies with Fire Classifications: Unit skylight tested in accordance with and listed as passing Class B Burning Brand test as described in ASTM E 108.
 - E. Dome Burn Rate: Tested in accordance with ASTM D 635 with a documented rating of CC1 for (polycarbonate).
 - F. Dome Smoke Density Rating: Testing in accordance with ASTM D 2843 with a documented performance value less than or equal to 75.
 - G. Dome Self-Ignition Temperature: Tested in accordance with ASTM D 1929 with a documented performance value greater than or equal to 650 degrees Fahrenheit.
 - H. Energy Performance ratings for any size commercial curb mounted unit skylight with dynamic dome as follows:
 1. Thermal Transmittance: ANSI/NFRC 100 maximum U-factor: 0.68
 2. Solar Heat-Gain Coefficient (SHGC): ANSI/NFRC 200 maximum SHGC:
 - a. Double Dome:
 - 1) LuxGuard with white prismatic inner dome: 0.60
 - 2) LuxGuard with clear prismatic inner dome: 0.63
 3. Visible Transmittance (Vt) and Percent Haze: ASTM D 1003:
 - a. Double Dome:
 - 1) LuxGuard with white prismatic inner dome: Vt = 61.9%, Haze = 100%
 - 2) LuxGuard with clear prismatic inner dome: Vt = 83.9%, Haze = 100%
 - I. Fall Protection Standard Compliance: 29 CFR 1910.23: Skylight [dome], [safety screen] tested to support a minimum of 400 pounds over 1 square foot of the surface.

2.6 MATERIALS

- A. Joint Sealants: As specified in Section 079200 "Joint Sealants."
- B. 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. For custom flashings, install unit skylight curb counter-flashing to produce weatherproof seal with curb and overlap with roofing system termination at top of curb.

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