



## Equivalency Evaluation Report

Date: August 2, 2023

PTC Report No.: 2396-EER

Report Revision No.: 5

PTC Project No.: 422-0615

Product Mfg.: Solatube International, Inc.  
2210 Oak Ridge Way  
Vista, CA 92081

Product Name: Solatube M74 DS Curb Mount Open Ceiling TDD - Dual Glazed  
Solatube M74 DS Curb Mount Open Ceiling TDD - Single Glazed

Product Category: Sky Lights

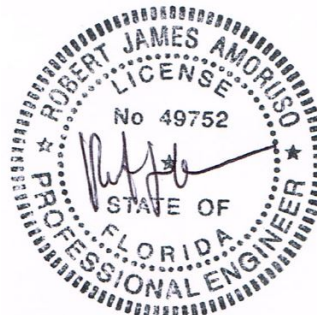
Product Sub-Category: Skylight

Compliance Method: Product Approval Rule 61G20-3.015 – Equivalency of Standards

Prepared By: Robert J. Amoruso, P.E.  
Florida P.E. License Number 49752  
PTC Product Design Group, LLC  
FBPE Certification of Authorization No. 25935

### CERTIFICATE OF INDEPENDENCE

PTC Product Design Group, LLC and Robert J. Amoruso, P.E. do not have, nor will acquire, any financial interest in the company manufacturing or distributing product(s) covered by this Product Evaluation Report. PTC Product Design Group, LLC and Robert J. Amoruso, P.E. do not have, nor will acquire any financial interest in any other entity involved in the approval process or testing of the product(s) covered by this Product Evaluation Report.



Digitally signed  
by Robert J  
Amoruso  
Date: 2023.09.26  
15:39:46 -04'00'

Evaluated by:  
Robert J. Amoruso, P.E.  
Florida P.E. License Number 49752

# Project Scope

Evaluate equivalency of testing standards used for the performance testing of Solatube M74 DS Curb Mount Open Ceiling TDD - Dual Glazed for conformance to the 8th Edition (2023) Florida Building Code – Building and Residential Volumes including the High Velocity Hurricane Zone (HVHZ) and Solatube M74 DS Curb Mount Open Ceiling TDD - Single Glazed Tubular Daylight Devices for conformance to the 8th Edition (2023) Florida Building Code – Building and Residential Volumes including the High Velocity Hurricane Zone (HVHZ).

## Description of Product – Installation Requirements

See Reference 1 for a description of the product, its installation and other pertinent data related to its approved use.

## Performance and Testing Standards

Reference 2.a conducted air, water and structural testing including impact and cyclic loading to the following standard(s).

1. AAMA/WDMA/CSA 101/I.S.2/A440-11, North American Fenestration Standard/Specification for windows, doors, and skylights.
2. ASTM E1886-13, 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.
3. ASTM E1996-12, Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes.
4. ASTM E283-04, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
5. ASTM E330-02, Standard Test Method for Structural Performance of Exterior windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
6. ASTM E547-00, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
7. TAS201-94, Impact Test Procedures.
8. TAS202-94, Criteria for Testing Impact & Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure.
9. TAS203-94, Criteria for Testing Products Subjected to Cyclic Wind Pressure Loading.

Reference 2.b.i conducted plastic testing to the following standard(s).

1. ASTM D638-03, Standard Test Method for Tensile Properties of Plastics
2. ASTM D638-06, Standard Test Method for Tensile Properties of Plastics
3. ASTM D1929-96 (2001)e1, Standard Test Method for Determining Ignition Temperature of Plastics.
4. ASTM D1929-12, Standard Test Method for Determining Ignition Temperature of Plastics.

5. ASTM D2843-99(2004), Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.
6. ASTM D2843-10, Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.
7. ASTM E84-04, Standard Test Method for Surface Burning Characteristics of Building Materials

Reference 2.b.ii conducted plastics testing to the following standard(s) in which the Plaskolite TUFFAK NOA confirms that plastic testing meets the 8th Edition (2023) FBC/FRC.

1. ASTM D638, Standard Test Method for Tensile Properties of Plastics
2. ASTM D1929, Standard Test Method for Determining Ignition Temperature of Plastics.
3. ASTM D2843, Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.

## References and Supporting Documents

### 1) Drawings

- a. M74 DS-O-DPP-FC-B-L2-REG, signed and sealed by Robert J. Amoruso, P.E. on 10/13/15, *Solatube M74 DS Curb Mount Open Ceiling TDD - Dual Glazed.*
- b. M74 DS-O-DP-FC-B-L2-REG, signed and sealed by Robert J. Amoruso, P.E. on 10/13/15, *Solatube M74 DS Curb Mount Open Ceiling TDD - Single Glazed.*

### 2) Testing

#### a. Performance Testing

- i. Architectural Testing Inc. (Fresno, CA) **Test Report No. 08050.01-301-44** Dated 7/14/2014
  1. Solatube M74-DS Open Ceiling Tubular Daylight Device
  2. ASTM E1886-13 and ASTM E1996-12
  3. Series/Model M74 DS-O-DP-FC-B-L2 (Single Dome)
  4. Series/Model M74 DS-O-DDP-FC-B-L2 (Dual Dome)
  5. Wind Zone 4, Missile Level D
  6. DP = 80 psf
- ii. Architectural Testing Inc. (Fresno, CA) **Test Report No. D8050.02-301-44** Dated 7/14/2014
  1. Solatube Open Ceiling Tubular Daylighting Device M74 DS
  2. Series/Model M74 DS-O-DP-FC-B-L2 (Single Dome)
  3. Series/Model M74 DS-O-DDP-FC-B-L2 (Dual Dome)
  4. TAS-201, TAS-202, and TAS 203 (Signed and Sealed by Tyler Westerling, P.E.)
  5. Large Missile Impact
  6. DP = 80 psf
- iii. Architectural Testing Inc. (Fresno, CA) **Test Report No. D8050.03-301-44** Dated 7/14/2014
  1. Solatube M74-DS Open Ceiling Tubular Daylight Device

2. Occupational Safety and Health Administration/ U.S. Department of Labor Regulations Standards - 29 CFR 1926 Subpart M (Fall Protection), 1926.501(b)(4)(i); 1926.501(i)(2); 1926.501(b)(4)(ii)
  - iv. Architectural Testing Inc. (Fresno, CA) **Test Report No. 08051.01-301-44** Dated 7/14/2014,
    1. Solatube Open Ceiling Tubular Daylighting Device M74 OS
    2. AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS
    3. Series/Model M74 DS-O-DP-FC-B-L2 (Single Dome)
    4. Series/Model M74 DS-O-DDP-FC-B-L2 (Dual Dome)
    5. DP = 80 psf
  - v. Architectural Testing Inc. (Fresno, CA) **Test Report No. D8051.02-301-44** Dated 7/14/2014
    1. Solatube M74 DS Single Glazed and Dual Glazed - Tubular Daylighting Device - Open Ceiling testing
    2. ICC-ES AC-16 (Part A3.1, A3.2, A3.3, A4.3 & Part 84.1), ASTM E 283-04, ASTM E 330-02 and ASTM E 547-00
    3. Series/Model M74 DS-O-DP-FC-B-L2 (Single Dome)
    4. Series/Model M74 DS-O-DDP-FC-B-L2 (Dual Dome)
    5. DP = 80 psf
- b. Plastics Testing
- i. International Code Council Evaluation Services – Evaluation Reports
    1. ICC-ES ESR-1407
    2. ICC-ES ESR-1864
    3. ICC-ES ESR-1659
    4. ICC-ES ESR-2591
    5. ICC-ES ESR-2728
  - ii. Miami-Dade Product Control Notice of Acceptance (NOA)
    1. Plaskolite, LLC TUFFAK Polycarbonate Sheet (formally Covestro MAKROLON Polycarbonate Sheet) NOA can be found [here](http://www.miamidade.gov/building/pc-result_detail_app.asp?app_alias=100477). ([http://www.miamidade.gov/building/pc-result\\_detail\\_app.asp?app\\_alias=100477](http://www.miamidade.gov/building/pc-result_detail_app.asp?app_alias=100477)).
- 3) Reports
- a. PTC Report No. 2396-PER, Rev. 5, *Solatube M74 DS Curb Mount Open Ceiling TDD – Product Evaluation*, signed and sealed by Robert J. Amoruso, P.E.

# Equivalency Evaluation – Performance Testing

Performance testing meets one or more of the adopted 8th Edition (2023) Florida Building Code and 8th Edition (2023) Florida Residential Code. In those cases where performance testing standard revision levels are not contained in the adopted code, the methods of testing and subsequent results were compared and found to be in conformance with the 8th Edition (2023) code. For product testing, the following testing standard versions were used.

- 1) AAMA/WDMA/CSA 101/I.S.2/A440-11
- 2) ASTM E1886-13
- 3) ASTM E1996-12
- 4) ASTM E283-04
- 5) ASTM E330-02
- 6) ASTM E547-00
- 7) TAS 201-94, TAS 202-94 and TAS 203-94

| Solatube TDD Performance Testing |                         | Florida Building Code  |                        |
|----------------------------------|-------------------------|------------------------|------------------------|
| Testing Standard                 | Standard Revision Level | 8th Edition (2023) FBC | 8th Edition (2023) FRC |
| AAMA/WDMA/CSA 101/I.S.2/A440     | 11                      | 11                     | 11                     |
| ASTM E1886                       | 13                      | 13a                    | 13a                    |
| ASTM E1996                       | 12                      | 14a                    | 14a                    |
| ASTM E283                        | 04                      | 04 (2012)              | 04 (2012)              |
| ASTM E330                        | 02                      | 14                     | 14                     |
| ASTM E547                        | 00                      | n/a                    | n/a                    |
| TAS 201                          | 94                      | 94                     | 94                     |
| TAS 202                          | 94                      | 94                     | 94                     |
| TAS 203                          | 94                      | 94                     | 94                     |

Reference 2.a.ii tested uniform static air pressure in accordance with TAS-202-94.

## ASTM E1996 TESTING EVALUATION:

- 1) Wind Zone 4 testing
  - a. ASTM E1996-14 moved Wind Zone 4 criteria to the non-mandatory appendix. As indicated in Appendix X4.1, ASTM E1996-14a, the Wind Zone 4 requirement, though non-mandatory, is still present and may be specified when needed to meet specific building codes requirements. Those requirements are detailed in Sections 1609.1.2.2, 1609.1.2.4 and 1609.3 of the Florida Building Code. Based on a review of the test reports, those parameters are met.

- 2) The Missile Level and Impact Speed used in testing are consistent with those currently required by the Florida Building Code and ASTM E1996.
- 3) The static load (ASTM E330) and cyclic load (ASTM E1886/E1996) parameters used in testing are consistent with those currently required by the Florida Building Code.

**CONCLUSION:** Testing and documented results in Reference 2.a.ii are compliant with the 8th Edition (2023) FBC – Building Volume, Residential Volume and Test Protocols. It has been concluded that no revisions or changes to the referenced standards have occurred that affect the results of design, testing or engineering of the approved product(s).

# Equivalency Evaluation – Plastics Testing

The changes in revision level of the ASTM Standard Test Methods and Practices as part of the 8th Edition (2023) FBC and 8th Edition (2023) FRC have been reviewed and found not to affect the method of testing, acceptance criteria, or reporting criteria in such a manner as to result in any change in the performance of the product. As such, test results obtained from testing to these standards are valid for demonstrating compliance to the 8th Edition (2023) FBC/FRC. The following table compares the revision levels of the Standards used in testing vs. those required by the 8th Edition (2023) FBC/FRC. It has been determined that Standards used in testing are equivalent to those in the 8th Edition (2023) FBC/FRC in accordance with Product Approval Rule 61G20-3.015(5)(d) – Equivalence of Standards.

| Solatube TDD Plastics Testing                                                                                         |                         |               |                         | Florida Building Code  |                        |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------|---------------|-------------------------|------------------------|------------------------|
| ITEM NO.                                                                                                              | MATERIAL                | ASTM Standard | Standard Revision Level | 8th Edition (2023) FBC | 8th Edition (2023) FRC |
| 1                                                                                                                     | Plaskolite / Tuffak SL  | ASTM G155     | 05a **                  | 13                     | n/a                    |
|                                                                                                                       |                         | ASTM D638     | 03 **                   | 03                     | 03                     |
|                                                                                                                       |                         | ASTM D635     | 06 ** ++                | 14                     | n/a                    |
|                                                                                                                       |                         | ASTM D1929    | 96(2001)e1 **           | 16                     | n/a                    |
|                                                                                                                       |                         | ASTM D2843    | 99(2004)e01 **          | 16                     | n/a                    |
| 2                                                                                                                     | Eastman / Spectar       | ASTM D635     | 03                      | 14                     | n/a                    |
|                                                                                                                       |                         | ASTM D1929    | 96(2001)e1              | 16                     | n/a                    |
|                                                                                                                       |                         | ASTM D2843    | 99(2004)                | 16                     | n/a                    |
|                                                                                                                       | Plaskolite / Vivak      | ASTM D635     | 06                      | 14                     | n/a                    |
|                                                                                                                       |                         | ASTM D1929    | ASTM D1929-12           | 16                     | n/a                    |
|                                                                                                                       |                         | ASTM D2843    | 10                      | 16                     | n/a                    |
| 16                                                                                                                    | R-Max / TSX-8500        | ASTM E84      | 04                      | 18b                    | 18b                    |
|                                                                                                                       | DOW / Thermax Sheathing |               | 04                      | 18b                    | 18b                    |
| 25                                                                                                                    | Plaskolite / Optix      | ASTM D635     | 03                      | 14                     | n/a                    |
|                                                                                                                       |                         | ASTM D1929    | 96(2001)e1              | 16                     | n/a                    |
|                                                                                                                       |                         | ASTM D2843    | 99(2004)                | 16                     | n/a                    |
| **TUFFAK NOA confirms testing meets Current Edition FBC based on this evaluator’s review of the currently issued NOA. |                         |               |                         |                        |                        |
| ++ ICC-ES ESR-2728 confirms testing meets 8th Edition (2023) FBC.                                                     |                         |               |                         |                        |                        |