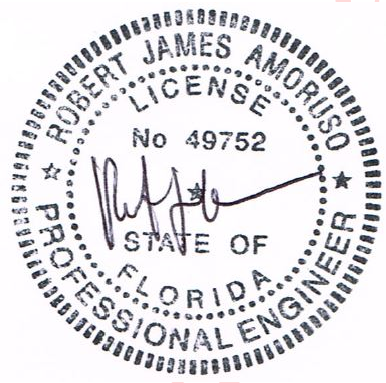
Product Evaluation Report

Client:	Solatube International, Inc. 2210 Oak Ridge Way Vista, CA 92081
Product:	Solatube “Solar Star” Solar Powered Attic Fan
Compliance Method:	Product Approval Rule 61G20-3.005(2)(b) – Product Evaluation Report by a Licensed Professional Engineer
Product Category:	Roofing
Product Sub-Category:	Roofing Accessories that are an Integral Part of the Roofing System
Prepared By:	Robert J. Amoruso, P.E. Florida P.E. License Number 49752 PTC Product Design Group, LLC FBPE Certification of Authorization No. 25935
Project No.:	422-0615
Project Report No.:	1904-PER
Revision:	6
Date:	August 3, 2023



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Evaluated by:
Robert J. Amoruso, PE
FL PE No. 49752

Project Scope

Evaluate Solatube "Solar Star" Solar Powered Attic Fan for conformance to the 8th Edition (2023) Florida Building Code – Building and Residential Volumes excluding the High Velocity Hurricane Zone (HVHZ). Prepare the following:

- Product Installation Details/Drawings (Reference 1)
- Installation Anchorage Evaluation (Reference 3)
- Product Evaluation Report (this report)

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.

Limitations and Conditions of Use

This product evaluation report contains or refers to specifications, technical details and installation details and/or methods that pertain to the proper use and/or installation of the product specified herein. Specific limitations and conditions of its use including but not limited to the following are contained in Reference 1 and are the subject of Product Approval in accordance with the State of Florida Product Approval Rule 61G20-3.

- Design Pressure Rating (psf)
- Installation substrate requirements.
- Installation anchor requirements.
- Installation restrictions.
- Product description.
- Product components.

Code Conformance – Structural Performance

No specific code conformance requirements exist outside of the High Velocity Hurricane Zone (HVHZ) for structural adequacy of roof mounted attic fans. Therefore, this product is not specifically addressed in the code for non-HVHZ applications. Section 1709 of the 8th Edition (2023) FBC was used to determine an acceptable means by which to ascertain the structural adequacy of the roof mounted attic fan.

In conformance with Section 1709.2 of the 8th Edition (2023) FBC, the structural adequacy of the roof mounted attic fan was determined by testing using the test protocol ASTM E 330 **–** *Standard Test Method for Structural Performance by Uniform Static Air Pressure Difference* and applying a Safety Factor of two (2) to the structural test pressures as follows.

- From Reference 2.a, Uniform Load Structural Test Pressures where +75/-165 psf.
- In accordance with the 8th Edition (2023) FBC, Section 1504.9 a Safety Factor of 2 is applied to arrive at Design Pressures of +37.5/-82.5 psf.

Based on testing to ASTM E 330, determining design pressure rating by application of a safety factor of 2 to the structural test pressure loading and engineered anchorage installation requirements, the product described herein has demonstrated compliance with the 8th Edition (2023) Florida Building Code, Section 1609 for wind loads not to exceed +37.5/-82.5 psf.

This report does not evaluate the product specified herein for use in the High Velocity Hurricane Zone.

Code Conformance - Plastics

The 8th Edition (2023) Florida Building Code, Sections 2605.2(1), 2606 and 2606.4 requires plastics to meet certain fire-related requirements. The fan grill is comprised of Polypropylene.

Though specifically addressing exterior plastic veneer or light-transmitting plastics, the fan grill has been tested to the requirements of these sections.

Based on testing to ASTM D 1929, E 84 and D 635, the product described herein has demonstrated compliance with the 8th Edition (2023) Florida Building Code.

8th Edition (2023) FBC, Section 2606.4 Specifications. *Light-transmitting plastics, including thermoplastic, thermosetting or reinforced thermosetting plastic material* code conformance is demonstrated by testing conducted by the manufacturer and documented in Reference 2.b, 2.c and 2.d as follows:

8th Edition (2023) FBC Non-HVHZ Requirements:

> **2606.4 Specifications**. Light-transmitting plastics, including thermoplastic, thermosetting or reinforced thermosetting plastic material, shall have a self-ignition temperature of 650°F (343°C) or greater where tested in accordance with ASTM D 1929; a smoke-developed index not greater than 450 where tested in the manner intended for use in accordance with ASTM E 84, or not greater than 75 where tested in the thickness intended for use in accordance with ASTM D 2843 and shall conform to one of the following combustibility classifications:
>
> **Class CC1:** Plastic materials that have a burning extent of 1 inch (25 mm) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635,

Class CC2: Plastic materials that have a burning rate of 2.5 inches per minute (1.06 mm/s) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D 635.

Solatube Solar Star Plastic Component

Polypropylene Fan Grill

Code-Compliance as follows:

1. ASTM D 1929 testing (Reference 2.b)

    a. Documented Characteristics: A self-ignition temperature of 880°F
    b. Code Compliance: A self-ignition temperature of 650°F (343°C) or greater was met.

2. ASTM E 84 testing (Reference 2.c)

    a. Documented Characteristics (tested in manner to be used): Smoke Developed (Smoke Density Index) 250
    b. Code Compliance: Smoke Developed (Smoke Density Index) not greater than 450 was met.

3. ASTM D 635 testing (Reference 2.d)

    a. Documented Characteristics: A CC2 Combustibility classification was received.
    b. Code Compliance: Combustibility classification of either CC1 or CC2 was met.

Performance and Testing Standards

Reference 2 conducted testing to the following standard(s)

1) ASTM E 330 – 02, *Standard Test Method for Structural Performance by Uniform Static Air Pressure Difference*
2) ASTM D 1929 - 96(2001)e1, *Standard Test Method for Determining Ignition Temperature of Plastics*
3) ASTM E 84 - 09a, *Standard Test Method for Surface Burning Characteristics of Building Materials*
4) ASTM D 635 - 06, *Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position*

References and Supporting Documents

1) Drawings
    a. SOLA0003, Revision E, dated 2/6/2018, *Solatube Solar Star - Low & High-Profile Roof Vents – Installation Anchorage Details.*
2) Testing
    a. Architectural Testing Inc. Test Report No. 95385.01-301-44, dated 12/10/09, *Solatube "Solar Star" Solar Powered Attic Fan testing to ASTM E330.*
    b. SGS U.S. Testing Company Inc., Test Report No. 2228540-3, dated 12/1/10, *Solatube "Solar Star" Solar Powered Attic Fan testing to ASTM D1929.*
    c. SGS U.S. Testing Company Inc., Test Report No. 2228540-1, dated 12/1/10, *Solatube "Solar Star" Solar Powered Attic Fan testing to ASTM E84*.
    d. SGS U.S. Testing Company Inc., Test Report No. 2228540-2, dated 12/6/10, *Solatube "Solar Star" Solar Powered Attic Fan testing to ASTM D635.*

3) Reports
    a. PTC Report No. 2143, Rev. 0, Solatube "Solar Star" Solar Powered Attic Fan - Anchorage Engineering, dated 8/15/12, signed and sealed by Robert J. Amoruso, P.E.
    b. PTC Report No. 1904-EER, Rev. 6, Solatube "Solar Star" Solar Powered Attic Fan – Equivalency Evaluation to FBC, signed and sealed by Robert J. Amoruso, P.E.
    c. PTC Report No. 2142, Rev. 2, Solatube "Solar Star" Solar Powered Attic Fan – Comparative Evaluation and Analysis, dated 2/6/18, signed and sealed by Robert J. Amoruso, P.E.

4) 8th Edition (2023) Florida Building Code
    a. Section 1609, Wind Loads
    b. Section 1709, Preconstruction Load Tests
    c. Section 2605.2(1), Plastic Veneer / Exterior use
    d. Section 2606, Light-Transmitting Plastics
    e. Section 2606.4, Light-Transmitting Plastics / Specifications