



Solatube® Fire Solutions Guide

Overview

Understanding fire codes and their impact on Solatube Daylighting Systems under various circumstances as well as having a working knowledge of alternative solutions is essential when planning to execute Solatube installation projects. This guide covers building standards related to fires, how those codes restrict the use of Solatube products, and some potential solutions.

Keep in mind, there is not one single issue to evaluate. There are different codes, type of construction, building occupancy, as well as distinct areas of a building structure that must be considered.

This report addresses these areas separately, providing possible solutions (both Solatube as well as third party solutions) when Solatube Daylighting Systems are involved.

Warranty information and technical support of all non-Solatube components will be provided by the product manufacturers. Any questions regarding non-Solatube components listed in this guide should be directed to the manufacturer.



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Fire Code Review & Potential Solutions

Resources / References

Most code sections in this guide have been obtained from the California adaptations

2015 International Building Code (IBC)

2018 International Mechanical Code (IMC)

2019 California Green Building Code (CALGreen)

2015 International Wildland-Urban Interface Code (IWUIC)

2015 International Fire Code (IFC)

These standards are the most recognized governing bodies for building construction. The [International Code Council](#) (ICC) is the author of all the “International” Codes. In all cases, the code standards may be either rejected, adopted, or adopted with amendments at the regional and local level by the Authority Having Jurisdiction (AHJ). In all cases, the code standards may be either rejected, adopted, or adopted with amendments at the regional and local level by the AHJ. We recommend that you find out what the AHJ have determined to enforce in the form of regulations and ordinances.

Some solutions referenced in this guide are Solatube products. Others are available from third party sources. Solatube International Inc. has not formally tested third party solutions. These are provided as a reference for potential solutions when fire codes effect your project. **We encourage that you consult with the architect, engineer, building official, fire marshal, or other AHJ when considering third party options. The AHJ will have the final say on what is accepted for each project.**

Disclaimer: At the time of this publication, the third party products listed in this guide were commercially available. Please check with appropriate vendor for current availability and specifications. Contact information for third party vendors is provided at the end of this guide.

Potential Solutions

Roof Assemblies

Solatube International Approved Solutions

The Solatube Dome Edge Protection Band on Plastic a Domed Solatube fulfills the requirements of [IBC 2610.2](#), “Edges of light-transmitting plastic skylights or domes shall be protected by metal or other approved noncombustible material” and thereby meets the exception in [IBC 1505.1](#), “Exception: Skylights and sloped glazing that comply with [IBC Chapter 24](#) or [IBC 2610](#)”. Thus, regulations permit Solatubes with dome-edge-protection bands on Class A, B, or C roof covering applications without any additional provision.

See also: [CCRR 0131](#) Section 3.1.1.4 A corrosion resistant steel dome edge protection band is utilized to protect the dome edge on installations on roof assemblies with fire classifications or A, B, or C.



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In addition, Solatube International tested configurations of Solatube 330 DS and 750 DS according to ASTM E108-07a, indicating the additional assurance that the 11” High Flashing provides. The test was conducted by an ANSI accredited third party laboratory with the Target: Class B (1-hour extended) test. The test report shows that the samples passed the requirements of ASTM E108-07a. The test exceeded the standard by the application of four Burning Brands, which were consumed in the same location in sequence, whereas the standard applies only two Burning Brands at separate locations in sequence. In addition to the prescribed test method, Solatube International specified that the test run for an extended period of 60 min.

The ASTM E108 Standard Test Methods for Fire Tests of Roof Coverings covers the measurement of the relative fire characteristics of roof coverings exposed to simulated fire sources originating outside the building.

In order to qualify for the results achieved in this test, the product configuration must include any of the following: No other Solatube product configurations were submitted for testing. Other product configurations are not covered by this test report. Please contact your Solatube International representative with any questions.

1. Solatube 330 DS Dome
2. 750 DS Dome
3. 750 DS Dual Dome
4. Solatube 11” High Flashing
5. Solatube Dome Edge Protection Band

Additionally, Solatube International tested configurations of Solatube 330 DS, 750 DS, and M74 DS in accordance with FM (Factory Mutual) 4431 Approval Standard for Skylights. FM 4431 includes a modified version of ASTM E-108, Fire Tests of Roof Coverings. Successful testing was conducted and Solatube was issued compliance certification for Class A roof covering at a 5 in 12 roof pitch.



Testing conducted on M74 DS at the FM Global Research Campus in Glocester, RI.



Testing conducted on 330 DS (Polycarbonate Dome) at the FM Global Research Campus in Glocester, RI.



Testing conducted on 750 DS with Polycarbonate Inner Dome at the FM Global Research Campus in Glocester, RI.

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Ceiling Finishes

Solatube Solutions

The following meet the provisions of [IBC 2606.7.2](#) and thereby comply with [IBC Chapter 8](#)

M74 DS - Acrylic Prismatic Diffuser (CCRR-0193: Diffuser may be used in all occupancies where it is $\leq 10\%$ of specific ceiling area in which it is attached)

[160 DS – Acrylic Just Frost Ceiling Mounted Diffuser](#) (Intertek Test Report: H1674.01-106-16)

[290 DS – Acrylic Just Frost Ceiling Mounted Diffuser](#) (Intertek Test Report: H1674.01-106-16)

No other Solatube product configurations were submitted for testing. Other configurations are not covered by these test reports. Please contact your Solatube International representative with any questions.

Ceiling Membrane - Roof/Ceiling Assembly

Potential Solutions

The Ceiling Membrane Penetration must be protected with a shaft constructed from the Ceiling to the Roof Deck or Slab using the same systems used in the Approved Fire-Resistance-Rated Ceiling Assembly. Be careful to tie-in to the Roof and Ceiling according to the method prescribed by the system to meet the performance specified.

Fire-Resistance-Rated Roof-Assembly - Fire Window Assembly

Potential Solutions

In the first case, a shaft must enclose the Solatube TDD and or Skylight from the Ceiling up to the roof deck or slab. The Shaft walls and the ceiling must meet or exceed the fire-resistance-rating of the roof deck or slab. No rating is required at the top of the shaft.

In the second case, the supporting construction (Posts, Columns, Beams, Rafters, Purlins, Interior side of the Deck, etc.) must meet or exceed the fire-resistance-rating of the roof deck or slab.

Dwelling Floor Penetration

Potential Solutions

Penetrations shall be installed as tested in the approved fire-resistance-rated assembly. Encase the Solatube where it transitions through the fire-resistance-rated floor assembly and space above the floor to the roof deck above in an outer shaft matching the fire-resistance-rating of floor assembly.

Fire and Smoke Protection Features

Corridors, Interior Exit Enclosures

Potential Solutions

If it is desirable for a Solatube Daylighting System to penetrate a corridor ceiling consult with the architect, engineer, and or building official to determine which type of corridor construction is involved:

If the corridor fire partitions extend from the top of the floor assembly below to the underside of the floor or roof slab or deck above, the Solatube Daylighting System should be allowed to penetrate the corridor ceiling without additional fire protection.

If the corridor fire partitions extend only from the top of the floor assembly below to the underside of the corridor ceiling above and the ceiling is constructed with the same fire-resistance-rating as required for the corridor walls, it should be permissible for the corridor ceiling to be penetrated by the Solatube Daylighting System if one of the following occurs:

1. An approved fire partition enclosing the Solatube TDD or Skylight extends from the top of the ceiling assembly to the underside of the floor or roof sheathing, slab or deck above.
2. An approved corridor fire/smoke ceiling damper is installed which will close the ceiling penetration in the event of a fire.
3. An approved Fire-rated flexible Insulation blanket enclosing the Solatube TDD or Skylight extends from the top of the ceiling assembly to the underside of the floor or roof sheathing, slab or deck above.

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Potential 3rd Party Solutions

When Listed by UL or others, Corridor Dampers are approved for use where air ducts penetrate or terminate at horizontal openings in the ceilings of fire-resistance-rated corridors, where the corridor ceiling is permitted to be constructed as required for the corridor walls.

[IBC 717.5.4.1](#) Corridors

In other than Group A, E, H, I, L and R occupancies, high-rise buildings, and other applications listed in [IBC 1.11](#) regulated by the Office of the State Fire Marshal, duct and air transfer openings that penetrate corridors shall be protected with dampers as follows: A corridor damper shall be provided where corridor ceilings, constructed as required for the corridor walls as permitted in [IBC 708.4](#), Exception 3, are penetrated.

Exception 3: Fire partitions serving as a corridor wall shall be permitted to terminate at the upper membrane of the corridor ceiling assembly where the corridor ceiling is constructed as required for the corridor wall.

[IBC 717.3.2.4](#) Corridor Damper Ratings

Corridor dampers shall have the following minimum ratings:

One hour fire-resistance rating.

Class I or II leakage rating as specified in [IBC 717.3.2.2](#).

[IBC 717.3.1](#) Damper testing

Corridor dampers shall comply with requirements of both UL 555 and UL 555S. Corridor dampers shall demonstrate acceptable closure performance when subjected to 150 feet per minute (0.76 mps) velocity across the face of the damper during the UL 555 fire exposure test.

Theoretically, Corridor Dampers may also be used with Solatube TDD to maintain the fire-resistive ratings of the Corridor Ceiling in the event of a fire. However, their use is not practical with Solatube TDD because the closure mechanism (in the open condition) would significantly block light transmission.

Fire-rated flexible Insulation blanket composed of high temperature fibers classified as a component in firestop designs for fire resistance rated floors, ceilings, and walls. A Fire-rated flexible Insulation wrap with fire rated sealant may be used to provide a fire-rated enclosure for the Solatube TDD. The material supplier may be able to provide an Engineering Judgement for specific projects. Consult with the material supplier and the building official, architect, or other AHJ on the project to confirm application suitability before proceeding.

[3M™ Fire Barrier Duct Wrap 615+](#)

[3M Fire Barrier Sealant CP 25WB+](#)

[FyreWrap® Elite® 1.5](#)

Air Plenum Penetrations

Potential 3rd Party Solutions

Fire blanket (Plenum Wrap) solutions have been approved in several applications. A method of attachment for fire blankets is necessary. Appropriate attachment needs to be discussed with the blanket manufacturer and the Authority Having Jurisdiction (AHJ) for each application.

Morgan Advanced Material - Thermal Ceramics

FireMaster® PlenumWrap™ Plastic Pipe System [PlenumWrap®+](#)

Intertek Listing No. [28346](#)

Intertek Drawing Design Number: [TC FRD 120-19 \(OPL PP 108 P\)](#)

3M™

Fire Barrier [Plenum Wrap 5A+](#)

Technical Data Sheet [5A+ Data Sheet](#)

Intertek Listing No: [Spec ID 26265](#)

Intertek Drawing Design Number [3MU/FRD 120-16](#)

Intertek Certificate of Compliance - [3M Fire Barrier Plenum Wrap 5A+](#)

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Unifrax

Plenum Wrap [FyreWrap® 0.5 Plenum Insulation](#)

High temperature insulation blanket designed to provide single layer, flexible enclosure around combustible items located within fire-rated return air plenums.

Intertek Listing No: Spec [ID: 32959](#)

Intertek Drawing Design Number [UNI/BI 20-03](#)

International Wildland-Urban Interface Code

Solatube International Solutions

To meet requirements of the Wildland-Urban Interface (WUI) Code for roof coverings and requirements of [IBC 708A.2.1](#):

Exterior windows, skylights and exterior glazed door assemblies shall comply with one of the following requirements:

1. Be constructed of multipane glazing with a minimum of one tempered pane meeting the requirements of Section 2406 Safety Glazing, or
2. Be constructed of glass block units, or
3. Have a fire-resistance rating of not less than 20 minutes when tested according to NFPA 257, or
4. Be tested to meet the performance requirements of SFM Standard 12-7A-2

The Solatube Rooftop Fire Glazing meets the prescriptive method of Option 1 of [IBC 708A.2.1](#) when used in conjunction with the Solatube Dome Edge Protection Band.

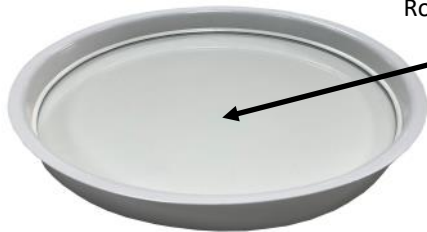
The CalFire Office of the California State Fire Marshal (SFM) has approved certain inspection agencies that are required to approve products for use in the (WUI) areas. Approved products are published in the SFM Building Materials Listing Program (BML).

The SFM states: If meeting prescriptive requirements of [IWUIC 101.2](#) and [IBC 708A.2.1](#), it is not necessary to list products on the SFM Building Listing Program. It is ultimately up to Local Jurisdiction to accept listed or non-listed solutions.

Solatube International has reviewed in length the Solatube WUI solution with the SFM and Cal Fire. (Please note that this does not constitute SFM or Cal Fire acceptance.)

If the Local Official needs assistance please contact Cal Fire or your Office of the State Fire Marshal as they can step you them through the prescriptive process.

160 / 290 / 300 DS
Rooftop Fire Glazing



330 / 750 DS
Rooftop Fire Glazing



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Contact Information

3M Fire Protection Products

Fire Barrier Duct Wrap 615+, Fire Barrier Wrap 15A+, Fire Barrier Sealant 25WB+

www.mmm.com

Morgan Advanced Material - Thermal Ceramics

FireMaster® PlenumWrap™ Plastic Pipe System

<http://www.morganthermalceramics.com>

Unifrax

FyreWrap Elite 1.5 Duct Insulation—Air Distribution System

www.unifrax.com

USG Sheetrock

Sheetrock Brand Firecode Core Gypsum Panels

www.usg.com

CertainTeed Drywall

CertainTeed Type X Gypsum Board

<https://www.certainteed.com/drywall>

CAL FIRE

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Office of the State Fire Marshal

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