Solar America Board for Codes and Standards

Fire Rating for PV Modules and Roofs

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Solar America Board for Codes and Standards (Solar ABCs)

PV Module Reliability Workshop

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Contains no confidential information

Solar ABCs

Solar ABCs is a collaborative effort among experts to provide coordinated recommendations to codes and standards making bodies for existing and new solar technologies.

Acknowledgement

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Roof Fire Class Rating

- International Building Code requires that roofs have a fire classification rating (Class A, Class B, Class C)
- Different buildings have different fire classification rating requirements
- States or local jurisdictions may enforce stricter requirements than the IBC

Roof Fire Class Rating

- Roof fire classification rating determined by UL 790 or ASTM E108
  - Spread of Flame Test
  - Burning Brand Test
  - Intermittent Flame Test

Code Requirements are Different For:

BIPV

Rack Mounted

Building-Integrated PV

Must be tested and classified as a roof covering (using methods in UL 790 or ASTM E108)

Rack-Mounted PV

Currently, the PV module receives a fire classification rating during UL 1703 testing (utilizing a subset of the methods used in UL 790)

Issue

What is the impact of a PV array on the fire classification of a rated roof?

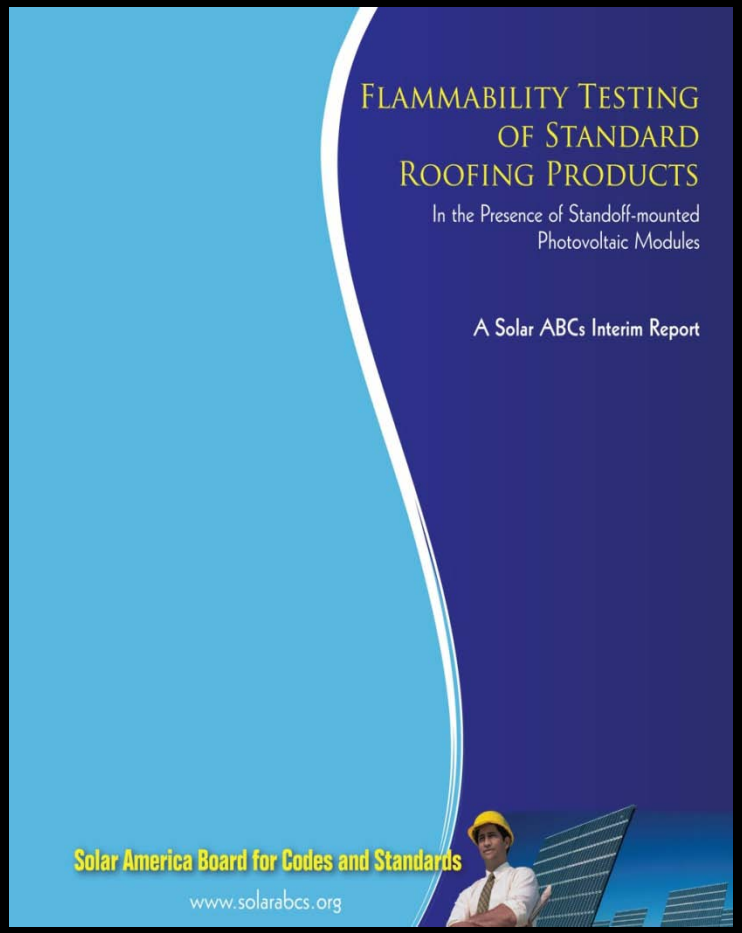
Solar ABCs Research Project

Investigate whether and how the presence of standoff-mounted PV arrays may affect the fire class rating of common roof covering materials.

Results

The fire classification rating of the PV module is NOT a good predictor of the fire class rating of the PV module and roof as a system.

Summary and Results to date



Current Work

- UL 1703 Standards Technical Panel is developing a system fire classification rating to replace the current module fire classification rating.

Current Tests

- UL is presently conducting tests to determine values for the heat release rates and critical flux for ignition for representative PV modules, roof coverings, and other components.
- Base on these results, UL will determine the final values for all test parameters needed to conduct the new PV system fire classification rating test

Overview of the New System Fire Classification Test

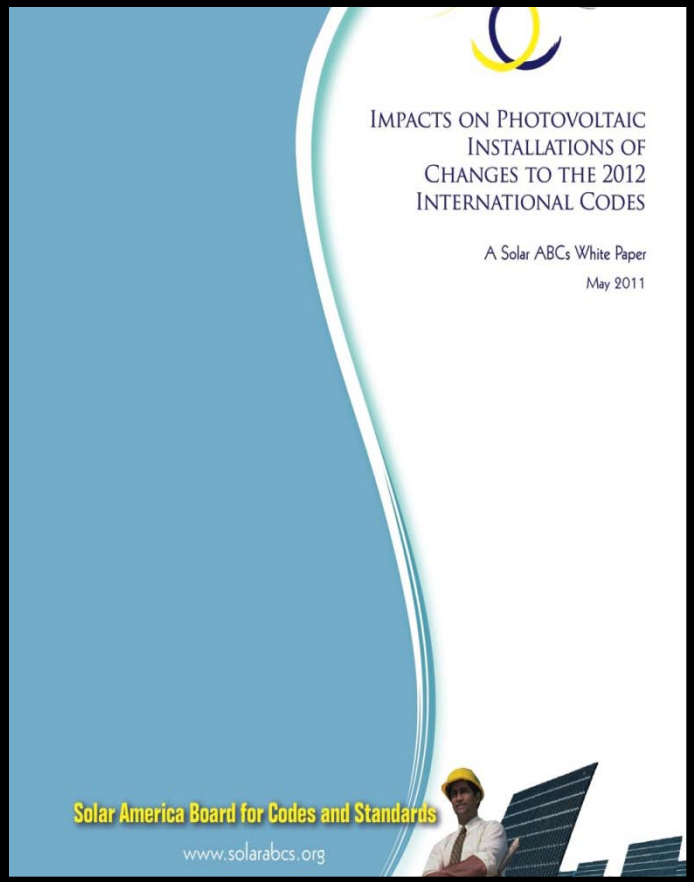
- Test is based on spread of flame and burning brand results for the module, rack and roof as a system
- Allows for substitution of similar module and roof covering materials
- Class A Rating will likely require barrier or baffle to prevent flame spread under the array
- New PV System test is a significant change from the module-only test currently in UL 1703

2012 International Building Code

- New language requires that fire classification of PV systems match the minimum fire classification of the roof assembly over which they are mounted.

- Straightforward implementation of this requirement is not possible at present.

2012 International Building Code



2015 International Building Code

- Proposals due earlier in January
- Hearings in Dallas, April 29 – May 5

2015 International Building Code Proposals

- Rooftop mounted photovoltaic panel systems shall be listed and labeled in accordance with UL 1703 for fire classification.
- The minimum photovoltaic panel system fire classification listing shall be as required by the code.

2015 International Building Code Proposals

- Exceptions Proposed:
  - Direct contact with roof surface
  - At least 12 inches above the roof surface
  - Steel or equivalent barrier around the array

Current Tests

- Validate proposed exceptions

Updates on Results from New Fire Rating Research

http://www.solarabcs.org/current-issues/fire_class_rating.html

www.solarabcs.org

- Current Issues
- Fire and Flammability
- Fire Class Rating of PV Systems

For more information

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