

Solar America Board for Codes and Standards



The Proposal for Changes to the Fire Rating of PV Modules in UL1703

Bill Brooks, PE

Brooks Engineering

Code Official Panel Lead

Solar America Board for Codes and Standards (Solar ABCs)

UL1703 Fire Classification Task Group Meeting

August 28, 2012



© 2012 Los Angeles Newspaper Group

Solar America Board for Codes and Standards



UL1703 Proposal in light of low and steep slope tests

- Baseline roof fire propagation should be around 12" past the interface location so that the proper balance of fire exposure takes place. (roughly 36" for steep slope and 42" for low slope).
- Low slope is more challenging than steep slope although angled PV modules help low slope systems pass.



UL1703

Fire Classification Proposal

- Task group formed in December 2010 to develop proposal to revise UL1703.
- Task group broadened to include important stakeholder members outside of STP (roofing industry, rack manufacturers) in December 2011.



Existing UL1703 Language

- Currently, the spread of flame test is only applied to the top of the module. (standard modules can pass Class A)
- Currently, the burning brand test considers a hole burned through the back of the module to be a failure of the test. (standard modules pass Class C—this is why most modules are Class C)



Proposed Changes to UL1703

- Apply flame to roof surface rather than on the surface of the module.
- Burning brand test is applied with a fire rated roof covering beneath the PV module.
- Modules not tested individually. PV systems are tested based on type of module (Glass/polymer; Glass/Glass)
- Standard roof configurations for steep and low slope mounting systems.



Spread of Flame Test-Steep Slope

- Steep sloped roofs use Class A, 3-Tab asphalt shingle roof system over 30# felt and 15/32" plywood deck at 5:12 angle.
- 3 baselines tested with average flame extension 48" or more. (no CRF necessary)
- Module mounting interface 36" from front of flame apparatus.



Spread of Flame Test-Low Slope

- Low sloped roofs use Class A, LSFR EPDM roof at $\frac{1}{2}$ " per foot angle over 4" isocyan. insulation and $\frac{15}{32}$ " ply deck.
- 3 baselines tested with average flame extension 54" or more. (No CRF necessary)
- Symmetrical cross section only tested once. Asymmetrical cross section is tested from three edges (1) the leading edge, (2) one side edge, and (3) the back edge of a typical perimeter array block used for the mounting system.



Burning Brand Test—Steep Slope

- Two different tests—ONLY for steep slope
- Test 1 is performed on surface of PV module above Class A, 3-Tab shingle roof.
- Test 2 uses a Class B brand between the PV module and the Class A roof. Test 2 is only performed if the array does not have a perimeter guard.
- Perimeter guard cannot pass 1/8" probe.



Conclusion

- Fire classification is primarily a function of the mounting system.
- Typing of modules dramatically reduces the number of tests necessary.
- Qualification of critical radiant flux for PV modules and roofing materials ensured testing consistency.
- Must have a solution that the STP will approve and is defensible with AHJs and roofing industry.



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



To Provide Comments for UL1703 if not on STP

Bill Brooks

UL1703 Fire Resistance Task Group Leader

bill@brooksolar.com

