

Fire testing roof-mounted PV systems

Possible fire classification concerns exist with rack-mounted PV systems

by Mark S. Graham

THE SOLAR AMERICA Board for Codes and Standards (Solar ABCs) has conducted limited testing of the fire resistances of rack-mounted photovoltaic (PV) panels installed over fire-classified roof coverings. If you are involved with the design or installation of roof-mounted PV systems, I encourage you to be aware of this testing and the concerns it raises.

Solar ABCs testing

Underwriters Laboratories (UL) Inc.'s classifications for PV modules and panels indicate installing them on a roof system may or may not adversely affect the roof system's external fire exposure if the PV modules or panels have a lesser fire-resistance rating than the roof system.

To determine whether rack-mounted PV modules or panels affect roof systems' fire classifications, Solar ABCs conducted a series of spread-of-flame and burning-brand tests on representative rack-mounted PV panels installed on fire-classified roof systems. The tests are similar to those conducted on PV panels and roof systems to determine their individual fire classifications.

The results, which are summarized in the figure, show for most of the configurations tested, the presence of rack-mounted PV panels on a roof system affects the roof

Spread-of-flame tests			
Fire classification			Result
Roof system	PV panel		
A	C		Failed Class A
A	A		Failed Class A
C	C		Failed Class A
Noncombustible	C		Failed Class A
Noncombustible	A		Failed Class A
Burning-brand tests			
Roof system	PV panel	Brand/position	Result
A	C	A/PV	Passed
A	C	A/Roof	Two passed/one failed
C	C	C/Roof	Failed
A	A	A/Roof	Failed

Results of fire tests

system's fire classifications. However, Solar ABCs' interim report states field experience and fire incident data do not indicate an urgent need to change current practices with regard to code requirements.

The interim report also indicates further testing is needed to refine the pass-fail criteria for performance tests for roof systems with rack-mounted PV panels and determine effective means of mitigating possible fire spread. NRCA is working with Solar ABCs to develop a testing program.

NRCA interim suggestions

Because Solar ABCs' testing confirms UL's

statement that PV panels can adversely affect roof system fire classifications, be cautious of making representations of roof assemblies' fire resistances when rack-mounted PV modules or panels are included.

You can represent the fire classifications of roof systems ("roof coverings" in UL's vernacular) and PV modules individually, similar to how UL currently classifies them.

On Thursday, Feb. 17, from 7:45 to 9:15 a.m., during the 2011 International Roofing Expo® in Las Vegas, UL representatives will present an educational session during which they will review Solar ABCs' testing. 

Mark S. Graham is NRCA's associate executive director of technical services.



For links to Solar ABCs' website and interim report, log on to www.professionalroofing.net.