

UL 7103 the new standard for building integrated photovoltaics

Architectural designs drive standards development

As solar photovoltaic (PV) technology matures it is increasingly being integrated into building construction and used to replace conventional materials in parts of the building envelope such as roofs, curtain walls, and windows. As conventional roof installations continue to increase and PV prices decrease, Building Integrated Photovoltaics (BIPV) are gaining popularity. Architects are now integrating the technology into their designs for the aesthetic value while helping building owners save on their cost of electricity with environmentally friendly generation. Furthermore, BIPV is a means to achieve compliance with energy conservation and sustainability requirements, and helps in achieving a LEED Building certification.

What is BIPV?

BIPV are products incorporating photovoltaic modules that also function as a component of the building envelope, and have been designed for both the basic requirements for both photovoltaic products and construction materials they are intended to replace. BIPV products are intended for mounting integrally to the structure

or protective surfaces of a building in one of two primary installation methods:

- to serve as the roof, or as a major component of the roofing system of a building
- to serve as part of a structural or non-structural component of a building, such as a curtain wall, facade, atrium, or skylight.

What is different about BIPV testing?

Currently, BIPV systems and their mounting means for roofing systems are evaluated separately for compliance to UL 1703, as well as UL 790 and either ASTM D3161 or UL 1897. The safety evaluation includes electrical, temperature, mechanical loading, wind resistance, impact and fire tests. The product's output wiring system is also investigated for conformance with the provisions of the National Electrical Code (NEC).

Having one standard to address all aspects of concern - electrical, fire, wind resistance, weather protection, impact resistance and durability - of this new type of building material makes it far easier far easier to demonstrate code compliance.



Safety certification for BIPV products is more stringent than for conventional PV modules

The National Electrical Code (NEC), International Building Code (IBC) and International Residential Code (IRC) require that all PV products that are intended to be installed on or around a building must be certified by a Nationally Recognized Testing Laboratory (NRTL). Because of these Code requirements, all BIPV products are subjected to the same electrical certification and safety testing standards as conventional PV modules and more.

Product installation concerns for PV panel systems include:

- Utility compatibility and interaction
- Environment (e.g. indoor, outdoor, hazardous location)
- Maximum number of modules (affecting voltage/current/short-circuit)
- Fire exposure ratings
- Wind and snow loading
- Mounting and attachment
- Grounding and bonding
- Shading

Since some BIPV are designed to directly replace roofing material, a BIPV system must be evaluated not only as a PV module but also as a roofing material with additional Code required testing such as:

- Fire testing *
- Impact testing
- Wind resistance
- Wind driven rain
- Environmental testing for conditions like:
 - Temperature
 - Humidity

** The fire testing includes those tests performed under the Solar PV Module safety standard (UL 1703) and additional tests that are normally applied to roofing materials (UL 790).*

Why UL?

Integration of PV systems into building products and architectural designs is growing. UL is deeply involved in codes and standards development and is uniquely positioned as a leader in the building and solar industries to advance the testing and certification of BIPV products into the building envelope.

Benefits of BIPV standards

Published standards in combination with conformity assessment provide a solid foundation upon which to certify building-integrated solar PV technologies and build confidence in new BIPV products for architects, developers, code authorities and investors.

For more information on UL services for the PV Industry please contact ulhelps@ul.com or call 1.877.ulhelps (1.877.854.3577)



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