

Background

- IBC and IRC promulgated by ICC
- Three-year publication cycle
- Governmental consensus process
 - Code development hearing
 - Final action hearing
 - Code officials have the final vote
- www.iccsafe.org/cs/codes



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Scope of IBC and IRC

IBC = all buildings and structures except covered by IRC

IRC = detached one- and two- family dwellings and townhouses not more than 3 stories above grade



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New requirements in 2012 editions

- Building Integrated Photovoltaic (BIPV)
 - Adhered to roof covering
 - PV modules/shingles
- Rack-mounted Photovoltaic
 - Rooftop structures

- Installation
- Materials
- Wind resistance
- Fire classification



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BIPV – Installation

IBC 1507.17.2
IRC R905.16.2

- Per manufacturer's installation instructions



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BIPV – Materials

IBC 1507.17.1

IRC R905.16.1

- Listed and labeled in accordance with UL 1703



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BIPV – Wind resistance

IBC 1507.17.3

IRC R905.16.3

- Tested in accordance with ASTM D3161
- Classification for maximum basic wind speed

Maximum Basic Wind Speed	Classification
85, 90, or 100	A, D, or F
110, 120, 130, 140, or 150	F



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BIPV – Fire classification

IBC 1505.8

- Tested and labeled in accordance with ASTM E108 or UL 790
- Class A, B, or C



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Rack-mounted PV – Installation

IBC 1509.7.3

IRC M2302

IBC and IRC

- Per manufacturer's installation instructions

IRC

- Per NFPA 70
- Roof constructed to support imposed load
- Roof and wall penetrations flashed and sealed



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Rack-mounted PV – Materials

IBC 1509.7.4

IRC M2302.3

IBC and IRC

- PV panels listed and labeled per UL 1703

IRC

- Inverters listed and labeled per UL 1741



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Rack-mounted PV – Wind resistance

IBC 1509.7.1

- Minimum design loads calculated by method prescribed for components and cladding using an effective wind area based on the dimensions of a single unit
- Potentially conservative (possibly over-estimated wind forces)
- Need wind tunnel testing to determine actual distribution of wind forces on the array



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Rack-mounted PV – Fire classification

IBC 1509.7.2

IRC M2302.2.1

IBC

- Fire classification of PV system to match minimum fire classification of roof assembly
- Tested in accordance with ASTM E108 or UL 790
- Class A, B, or C

IRC

- PV panels and supporting structure shall be
 - Noncombustible materials, or
 - Fire-retardant-treated wood equivalent to that required for the roof construction.



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Fire classification - Purpose

- Ability to prevent fire from penetrating through the roof
- Ability to minimize spread of fire along the roof surface



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Fire classification – Testing and certification

- PV modules – tested to UL 1703 (includes reference to UL 790)
- No current standard for PV system
- Factors
 - Mounting geometry of the array
 - Properties of the module components
- Solar ABCs/UL flammability research
www.solarabcs.org
- Development of UL 2703



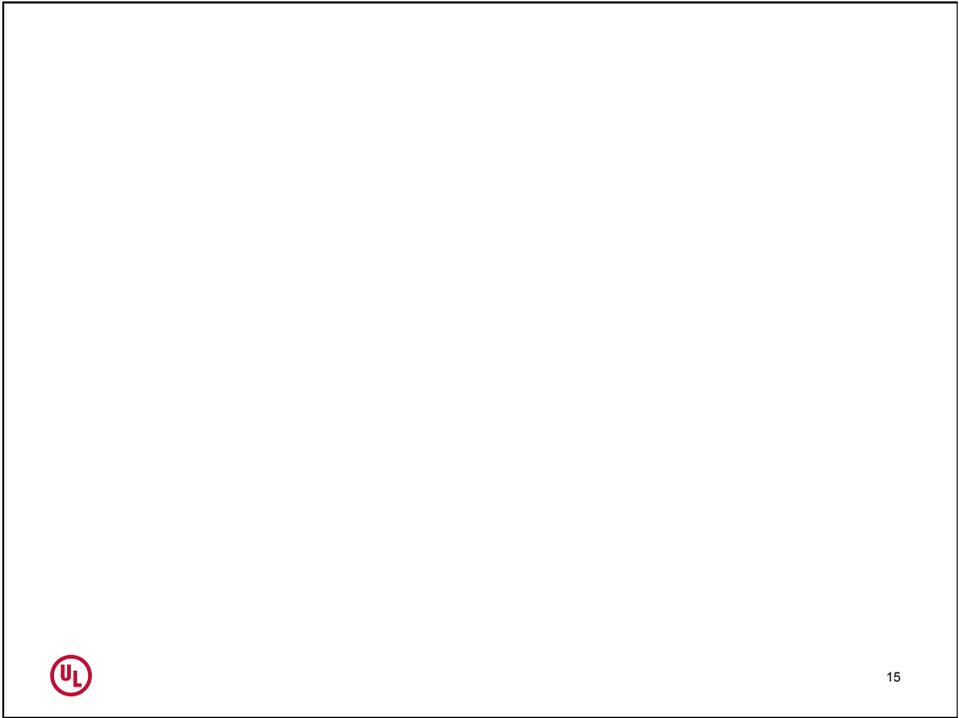
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Observations

- The requirements are different for BIPV systems and rack-mounted PV systems.
- Until a new PV system fire classification test is finalized and adopted, Section 1509.7.2 of the 2012 IBC, as written, may be difficult to apply.
- 2012 IBC Section 1509.7.1 prescribes the use of components and cladding requirements as the basis for calculating wind loads on PV arrays. This provides helpful guidance for wind engineering calculations, but may not provide results consistent with other methods accepted and used today.

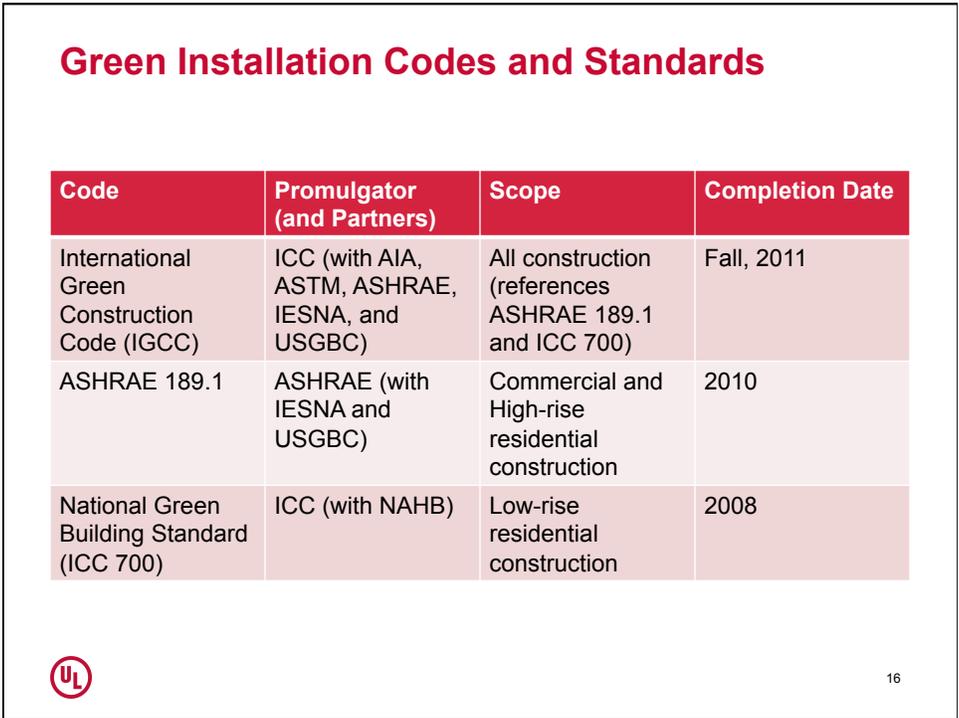


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Green Installation Codes and Standards

Code	Promulgator (and Partners)	Scope	Completion Date
International Green Construction Code (IGCC)	ICC (with AIA, ASTM, ASHRAE, IESNA, and USGBC)	All construction (references ASHRAE 189.1 and ICC 700)	Fall, 2011
ASHRAE 189.1	ASHRAE (with IESNA and USGBC)	Commercial and High-rise residential construction	2010
National Green Building Standard (ICC 700)	ICC (with NAHB)	Low-rise residential construction	2008



IGCC (PV2 – Public Version 2) – Key Photovoltaic Requirements

- Rough-in for future installations (Section 609.12)
 - Raceway size
 - Electrical service panel listed and labeled as suitable for connection to renewable energy source
 - Space reserved for future inverter
- Renewable energy (Section 611)
 - Install per manufacturer's installation instructions, IBC, IFC, and NFPA 70
 - Capacity not less than 2% of total annual energy use



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IGCC – Proposals of interest at the Final Action Hearing for the 2012 edition

- GG 34-11, Part V – define BIPV system and PV panel system, rough-in for future installations
- GEW 220-11 – rough-in for future installations
- GEW 242-11, 243-11, 246-11 – installation of PV systems



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IGCC Development Process – 2012 edition

Code Development Hearing – May 16-22 in Dallas (over 1100 code proposals)

Report of Code Development Hearing – June 27th

Deadline for Public Comments – August 12th

Public Comments posted – September 16th

Final Action Hearings – November 2-6 in Phoenix

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