

# Cool roofing and the codes

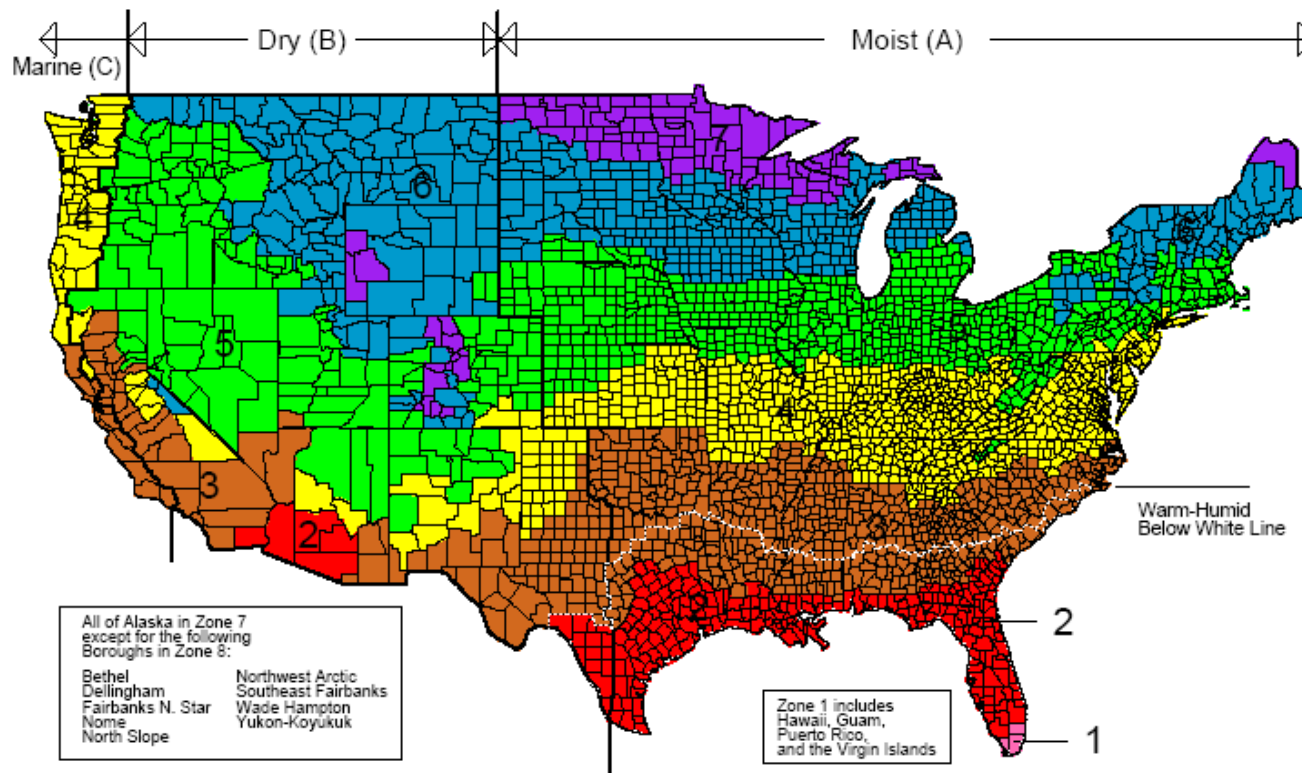
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- ASHRAE 90.1 & addendum f
- ASHRAE 90.2
- ASHRAE 189.1
- ASHRAE - Advanced Energy Design Guides
- USGBC – LEED Program

# Cool Roof Regions (Zones 1,2,3)

Map of DOE's Proposed Climate Zones



March 24, 2003

# ASHRAE 90.1

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- Energy Standard for Buildings Except Low-Rise Residential Buildings
- Used as one of the predominant commercial energy codes in the US market (Other is the International Energy Conservation Code)
- 2007 edition is current printed version, 2010 is next anticipated edition

# ASHRAE 90.1

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- Cool roof provisions in 2007 and previous editions remains voluntary.
- The CRRC is referenced in the cool roof provisions.
- CRRC is recognized as informative reference only.

# ASHRAE 90.1

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Current provisions require:

- Roofs other than roofs over ventilated attics or roofs over semi-heated spaces or roofs over conditioned spaces that are not cooled.
- Minimum SRI 0.70 and TE 0.75
- Minimum SRI 82

And

- If comply allowed to reduce roof insulation.

# ASHRAE 90.1 addendum f

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- Addendum "f" represents a major re-write of the cool roof provisions
- Now includes minimum initial and aged values
- Now includes a formula for those roof products which do not have a aged tested product
- Now includes a list of exemptions: e.g. Ballasted roofs, green roofs, roofs with photovoltaic's or collectors, etc.

# ASHRAE 90.1 addendum f

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- Addenda “f” has gone out for one public review
- Standard 90.1 committee reviewing comments and in process of assembling a re-write based on the comments for second public review.
- Second public review will take place June-July 2009.
- CRRC-1 remains as a referenced document.

# ASHRAE 90.2

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- Energy-Efficient Design of Low-Rise Residential Buildings
- Contains a simple trade-off mechanism for insulation when the building contains a cool roof
- CRRC-1 is referenced in the standard
- No proposed changes at this time

# ASHRAE 90.2

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- Standard requires the following:
- Minimum solar reflectance of 0.65
- Minimum thermal emittance of 0.75
- Or
- Minimum SRI of 75 when using ASTM E1980 for medium wind speed

# ASHRAE 189.1 – 3<sup>rd</sup> Draft

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- Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings
- Currently in draft form, and under its 3<sup>rd</sup> public review period (ends 15 June 2009)
- Under new committee structure as of January 2009.
- Standard is expected to be published in early 2010.

# ASHRAE 189.1 - 3<sup>rd</sup> Draft

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- Document effectively combines ASHRAE Standard 90.1 and LEED 2.2 NC.
- Cool roof provisions are required (3<sup>rd</sup> Draft Section 5.3.2.3)
- CRRC program is recognized in cool roof provisions as informative reference.

# ASHRAE 189.1 – 3<sup>rd</sup> Draft

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- Provisions currently read:
- Cool roofs apply to climate zones 1,2,3,4
- Min. 75% of roof must be cool roof
- Low slope roofs minimum SRI-78
- Steep slope roofs minimum SRI-29
- Mandatory provisions, no tradeoffs

# Advanced Energy Design Guides

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- Documents are “guides” and intended to provide a simple approach for contractors and designers.
- Application of recommendations should result in a 30% energy savings.
- Guides now cover small office buildings, retail, K-12 Schools, and small warehouse and self-storage buildings
- CRRC-1 is referred in each.

# USGBC - LEED 3.0

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- LEED 2009 for New Construction and Major Renovation
- Site Sustainability Credit 7.2 Heat Island, Under “potential technologies and strategies” CRRC and CRRC-1 remains referenced
- Energy and Atmosphere Credit 1, recognizes CRRC and CRRC-1 by default through ASRHAE documents (Standard 90.1 and AEDG)

# USGBC - LEED 3.0

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- Cool Roof provisions are:
- Minimum 75% of roof
- Low slope cool roof minimum SRI-78
- Steep slope cool roof minimum SRI-29
- OR
- A vegetated roof (Min. 75% coverage)
- OR, combination of above