

Technical Bulletin

Roof Insulation

Above deck roof insulation is prescribed¹ by ASHRAE 90.1, the energy standard for commercial and for multi-family residential buildings greater than 3 stories in height. ASHRAE 90.1 is referenced in the International Energy Conservation Code, which is referenced in the International Building Code. Therefore recent versions of 90.1 are the minimum energy design standard for most of the U.S.A.

Table I compares the prescriptive requirements for above deck roof insulation in the 2004, 2007 and 2010 editions of ASHRAE 90.1. Prescribed insulation levels are based on the concept of achieving “optimum insulation”, which is defined as the “lowest life-cycle cost” (LLC) amount of insulation calculated at the time that particular version of the Standard was adopted. See the Owens Corning data sheet that explains LLC. Volatility in energy costs, and ever rising construction costs generally cause the LLC amount of insulation to trend upward. Therefore specifiers should consider exceeding today’s minimum standards based on the expected life of the building and long term economic return on the investment in insulation.

The ASHRAE 90.1 criteria for roof insulation installed entirely above the roof deck is: 1) it is installed above (outside of) the roof structure and, 2) it is continuous (i.e., uninterrupted by framing members.)

Figure 1
USA Climate Zones

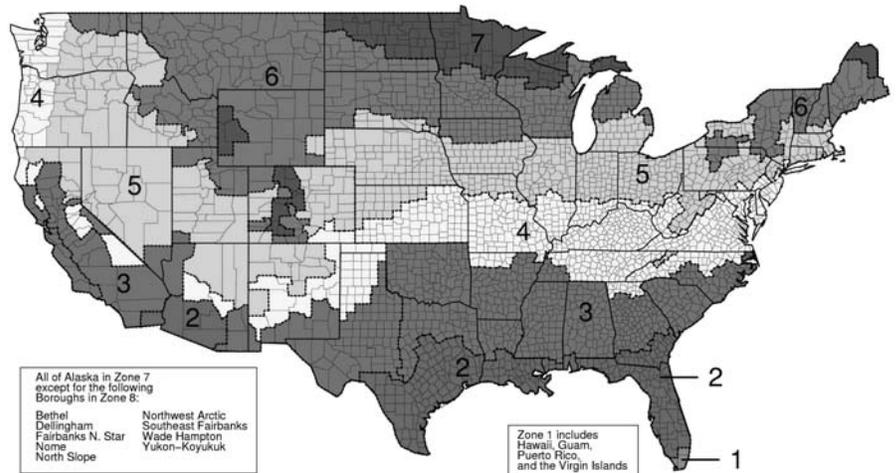


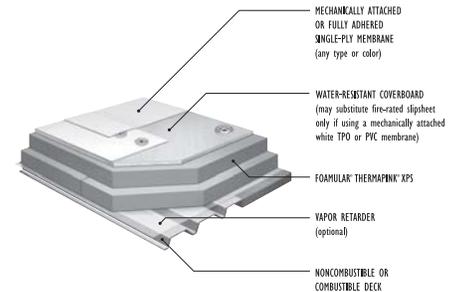
Table I
Roof Insulation Entirely Above Deck Prescriptive Requirements ASHRAE 90.1

Climate Zone	2004 Edition		2007 & 2010 Edition	
	Non-Res	Res	Non-Res	Res
1	15	15	15	20
2	15	15	20	20
3	15	15	20	20
4	15	15	20	20
5	15	15	20	20
6	15	15	20	20
7	15	15	20	20
8	20	20	20	20

Non-Res (Non-Residential)
Res (Residential)

Climate Zones for the continental USA are shown in Figure 1. Alaska is Zone 7, except the most northern boroughs that are Zone 8. Hawaii is Zone 1.

Figure 2
Roof Deck Assembly² with Insulation Entirely Above Deck



THERMAPINK® extruded polystyrene (XPS) insulation, installed entirely above the roof deck and continuous, is shown in Figure 2.



FOAMULAR® Extruded Polystyrene (XPS) Insulation Roof Insulation, Above Deck, Prescriptive Requirements

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Notes

1. When using the prescriptive compliance method.
2. Other variations of this assembly may include metal roofing, or other mechanically attached or fully adhered membranes, and other colors such as black, and, other cover layers such as a lightweight fabric slip sheet as appropriate for each system. THERMAPINK® insulation is applied direct to deck in accordance with Underwriters Laboratories Roof Deck Construction #457, tested in accordance with ANSI/UL Standard 1256.

Reference

ASHRAE Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings; American Society of Heating, Refrigerating and Air-Conditioning Engineers; Atlanta, GA.

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