

MPS No. 1020

Subject: ANSI/ASHRAE/IES Standard 90.1-2010 Insulation Requirements

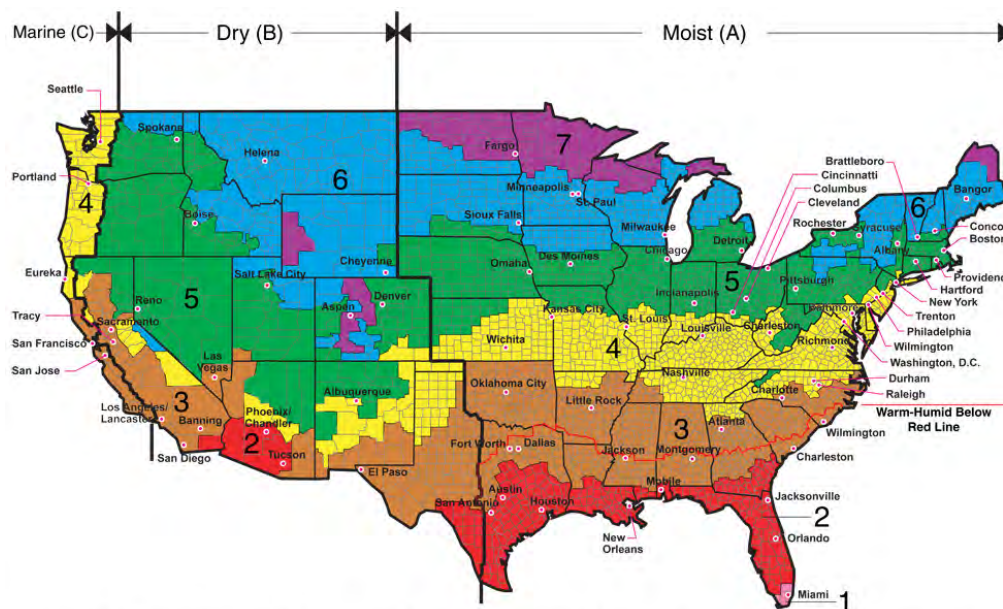
Date: April 2012 (Revised January 2019)

Tru-R insulation is a versatile insulation material which is suitable for installation in all areas of buildings. Tru-R insulation is available in a wide range of types and sizes to ensure that building owners are able to meet the most advanced energy code requirements, such as those published by the American Society of Heating, Refrigeration and Air-Conditioning Engineers, Inc. (ASHRAE). This bulletin provides a summary of the prescriptive insulation requirements of the 2010 edition of ASHRAE Standard 90.1, "Energy Standard for Buildings Except Low-Rise Residential Building". Please refer to ASHRAE Standard 90.1 for detailed information.

ASHRAE Standard 90.1 is applied to commercial buildings and multistory residential buildings and is often adopted as a code requirement at the State level. State adoption of ASHRAE 90.1 may also be to the prior versions of ASHRAE 90.1 issued in 2001, 2004, and 2007.

The tables included with this bulletin provide the minimum prescriptive insulation requirements of ASHRAE 90.1-2010. Alternative paths for conformance through detailed analysis are also available within the standard. Insulation requirements vary according to Climate Zone.

Climate Zones



All of Alaska in Zone 7 except for the following Boroughs in Zone 8: Bethel, Dellingham, Fairbanks, N. Star, Nome North Slope, Northwest Arctic, Southeast Fairbanks, Wade Hampton, and Yukon-Koyukuk

Zone 1 includes: Hawaii, Guam, Puerto Rico, and the Virgin Islands

Walls, Above Grade

ASHRAE Standard 90.1 provides prescriptive insulation requirements for above grade walls of heated buildings constructed with wood framing, steel framing, metal buildings, and mass (concrete, CMU, or stone) systems. The first number in the table below is the requirement for cavity insulation and the second number is for continuous insulation (ci). Continuous insulation minimizes heat loss since the insulation is installed continuously across the wall without thermal bridges other than fasteners and service openings.

| ASHRAE 90.1-2010 Prescriptive R-value | | | | | | | | |
|---------------------------------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|
| Walls, above grade | | | | | | | | |
| | Wood-Framed | | Steel-Framed | | Metal-Framed | | Mass | |
| Zone | Nonresi- dential | Residential | Nonresi- dential | Residential | Nonresi- dential | Residential | Nonresi- dential | Residential |
| 1 | 13 | 13 | 13 | 13 | 16 | 16 | NR | 5.7ci |
| 2 | 13 | 13 | 13 | 13+7.5ci | 16 | 16 | 5.7ci | 7.6ci |
| 3 | 13 | 13 | 13+3.8ci | 13+7.5ci | 19 | 19 | 7.6ci | 9.5ci |
| 4 | 13 | 13+3.8 ci | 13+7.5ci | 13+7.5ci | 19 | 19 | 9.5ci | 11.4ci |
| 5 | 13+3.8ci | 13+7.5ci | 13+7.5ci | 13+7.5ci | 13+5.6ci | 13+5.6ci | 11.4ci | 13.3ci |
| 6 | 13+7.5ci | 13+7.5ci | 13+7.5ci | 13+7.5ci | 13+5.6ci | 13+5.6ci | 13.3ci | 15.2ci |
| 7 | 13+7.5ci | 13+7.5ci | 13+7.5ci | 13+15.6ci | 13+5.6ci | 13+5.6ci | 15.2ci | 15.2ci |
| 8 | 13+15.6ci | 13+15.6ci | 13+15.6ci | 13+18.8ci | 19+5.6ci | 19+5.6ci | 15.2ci | 25.0ci |

ci = continuous insulation

Wall, Below Grade

ASHRAE Standard 90.1 provides prescriptive insulation requirements for below grade walls of heated buildings. Continuous insulation minimizes heat loss since the insulation is installed continuously across the wall without thermal bridges other than fasteners and service openings.

| ASHRAE 90.1-2010 Prescriptive R-value | | |
|---------------------------------------|----------------|-------------|
| Walls, below grade | | |
| Zone | Nonresidential | Residential |
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| 3 | 0 | 0 |
| 4 | 0 | 7.5ci |
| 5 | 7.5ci | 7.5ci |
| 6 | 7.5ci | 7.5ci |
| 7 | 7.5ci | 10.0ci |
| 8 | 7.5ci | 12.5ci |

ci = continuous insulation

Floor and Slabs

ASHRAE Standard 90.1 provides the prescriptive insulation requirements for mass floors and slab on grade floors of heated and unheated building.

| ASHRAE 90.1-2010 Prescriptive R-value | | | | | | |
|---------------------------------------|----------------|-------------|----------------------|------------------|------------------------|-----------------|
| Floors | | | | | | |
| | Mass | | Slab-On-Grade Heated | | Slab-On-Grade UnHeated | |
| Zone | Nonresidential | Residential | Nonresidential | Residential | Nonresidential | Residential |
| 1 | NR | NR | R-7.5 for 12 in. | R-7.5 for 12 in. | NR | NR |
| 2 | 6.3ci | 8.3ci | R-7.5 for 12 in. | R-7.5 for 12 in. | NR | NR |
| 3 | 6.3ci | 8.3ci | R-10 for 24 in. | R-10 for 24 in. | NR | NR |
| 4 | 8.3ci | 10.4ci | R-15 for 24 in. | R-15 for 24 in. | NR | R-10 for 24 in. |
| 5 | 10.4ci | 12.5ci | R-15 for 24 in. | R-15 for 24 in. | NR | R-10 for 24 in. |
| 6 | 12.5ci | 14.6ci | R-15 for 24 in. | R-20 for 48 in. | R-10 for 24 in. | R-15 for 24 in. |
| 7 | 12.5ci | 16.7ci | R-20 for 24 in. | R-20 for 48 in. | R-15 for 24 in. | R-15 for 24 in. |
| 8 | 14.6ci | 16.7ci | R-20 for 48 in. | R-20 for 48 in. | R-15 for 24 in. | R-20 for 24 in. |

ci = continuous insulation

Roof Insulation

ASHRAE Standard 90.1 provides the prescriptive insulation requirements for continuous roof insulation above roof decks.

| ASHRAE 90.1-2010 Prescriptive R-value | | |
|---------------------------------------|----------------|-------------|
| Roof | | |
| Above Deck | | |
| Zone | Nonresidential | Residential |
| 1 | 15ci | 20ci |
| 2 | 20ci | 20ci |
| 3 | 20ci | 20ci |
| 4 | 20ci | 20ci |
| 5 | 20ci | 20ci |
| 6 | 20ci | 20ci |
| 7 | 20ci | 20ci |
| 8 | 20ci | 20ci |

ci = continuous insulation