



These tables compare ASHRAE 90.1\* (2004 and 2010 editions) prescriptive insulation requirements for wood framed walls, steel framed walls, and mass (concrete, stone, or CMU) walls, for each of the eight USA climate zones defined in 90.1. The wood and steel framed tables show prescribed stud cavity R value as the first number, and continuous insulation R as the second number. (Example: 13 + 7.5) The mass wall table shows only the prescribed continuous insulation R value as there is typically no cavity insulation in mass wall construction.

For purposes of ASHRAE 90.1, “residential” is defined as multi-family structures greater than three (3) stories in height. “Non-residential” is defined as all occupancies other than residential. 90.1 also provides prescriptive insulation values for “semi-heated” buildings that are not shown in these tables.

These tables apply to buildings that are heated and/or cooled as defined in 90.1.

\* ASHRAE Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings; American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.; 1791 Tullie Circle NE, Atlanta, GA 30329

**ASHRAE 90.1 Prescriptive R Requirements for  
“Wood Framed and Other Walls, Above Grade”**

ZONE	ASHRAE 90.1 - 2004		ASHRAE 90.1 - 2007	
	Non-Residential	Residential	Non-Residential	Residential
<b>1</b>	13	13	13	13
<b>2</b>	13	13	13	13
<b>3</b>	13	13	13	13
<b>4</b>	13	13	13	13 + 3.8
<b>5</b>	13	13	13 + 3.8	13 + 7.5
<b>6</b>	13	13 + 3.8	13 + 7.5	13 + 7.5
<b>7</b>	13	13 + 7.5	13 + 7.5	13 + 7.5
<b>8</b>	13 + 7.5	13 + 7.5	13 + 15.6	13 + 15.6



**ASHRAE 90.1 Prescriptive R Requirements for  
“Steel Framed Walls, Above Grade”**

ZONE	ASHRAE 90.1 - 2004		ASHRAE 90.1 - 2007	
	Non-Residential	Residential	Non-Residential	Residential
<b>1</b>	13	13	13	13
<b>2</b>	13	13	13	13 + 7.5
<b>3</b>	13	13 + 3.8	13 + 3.8	13 + 7.5
<b>4</b>	13	13 + 7.5	13 + 7.5	13 + 7.5
<b>5</b>	13 + 3.8	13 + 7.5	13 + 7.5	13 + 7.5
<b>6</b>	13 + 3.8	13 + 7.5	13 + 7.5	13 + 7.5
<b>7</b>	13 + 7.5	13 + 7.5	13 + 7.5	13 + 15.6
<b>8</b>	13 + 7.5	13 + 10.0	13 + 7.5	13 + 18.8

**ASHRAE 90.1 Prescriptive R Requirements for  
“Mass Walls, Above Grade”**

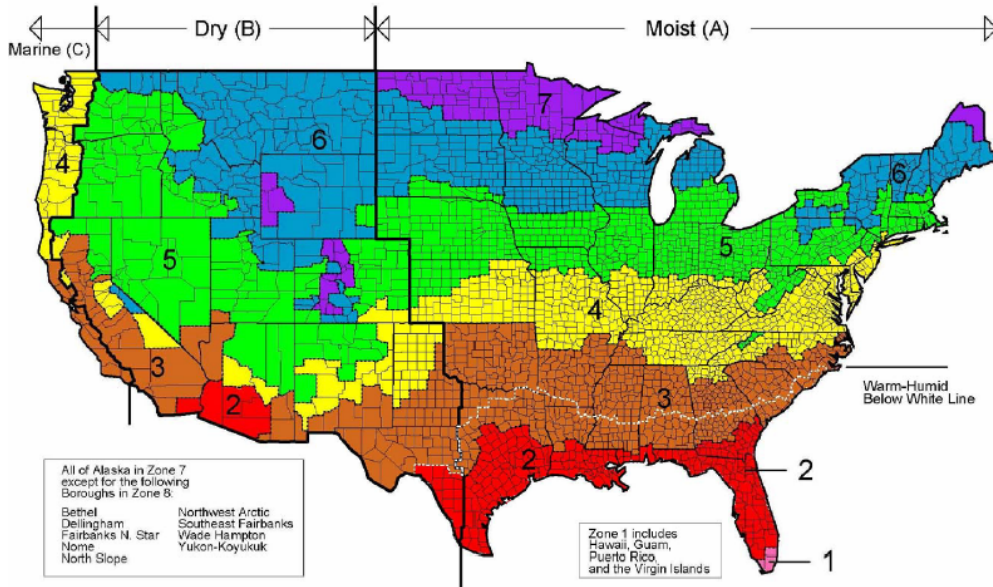
ZONE	ASHRAE 90.1 - 2004		ASHRAE 90.1 - 2007	
	Non-Residential	Residential	Non-Residential	Residential
<b>1</b>	NR	5.7	NR	5.7
<b>2</b>	NR	5.7	5.7	7.6
<b>3</b>	5.7	7.6	7.6	9.5
<b>4</b>	5.7	9.5	9.5	11.4
<b>5</b>	7.6	11.4	11.4	13.3
<b>6</b>	9.5	11.4	13.3	15.2
<b>7</b>	11.4	13.3	15.2	15.2
<b>8</b>	13.3	15.2	15.2	25.0

Mass walls are defined as “a wall with an HC (heat capacity) exceeding:

- (1) 7 Btu/ft<sup>2</sup> x °F, or,
- (2) 5 Btu/ft<sup>2</sup> provided that the wall has a material unit weight not greater than 120 lb/ft<sup>3</sup>.

Heat capacity is defined as “the amount of heat necessary to raise the temperature of a given mass 1°F. Numerically, the HC per unit area of surface (Btu/ft<sup>2</sup> x °F) is the sum of the products of the mass per unit area of each individual material in the roof, wall, or floor surface multiplied by its individual specific heat.

## USA Climate Zones (ASHRAE 90.1, 2004 and 2007)



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