



Hunter Xci Tech Topic #108

Question: How does the test method work for determining R-value of a building product?

Answer: R-value is the most commonly used measurement tool used in the building and construction industry to evaluate resistance to heat flow. The higher the product’s R-value measurement, the greater the insulating power.

Measuring R-value, or resistance to heat flow, is accomplished by placing the material to be tested between two plates of different temperatures. ASTM C518 utilizes both hot and cold plates that are air-impermeable, directly in contact with the sample being tested. Heat flow is then measured across the sample as temperatures of the plates are maintained. One plate would be considered the “cold side” and the other would be considered the “warm side”. The mean temperature is the average between the temperatures on both sides of the test mechanism (Temp of cold side + Temp of warm side/2).

Question: Temperature and R-values, what are the important facts to understand?

Answer: Thermal resistance of materials can vary with temperature, so the FTC has established published requirements for R-value to be measured at 75 degree mean temperature creating a uniform standard across materials. Attempts to redirect conversation toward R-values at different mean temperatures are often misleading or confusing, which is why the FTC established the 75 degree mean temperature requirement.

It is important to note, mean temperature is not synonymous with ambient temperature, or outdoor temperature. Mean temperature in terms of R-value would be the average between the temperature on the cold side of the wall and the temperature on the warm side of the wall.

Assuming the indoor temperature of a building to be 68 degrees year round, that temperature could serve as either the warm side or the cold side. The below chart contains mean average high and low temperatures of major cities across the USA:

Average Annual Temps*

Northeast	Avg High	Avg Low	Avg Mean High	Avg Mean Low
Boston	59	44	63.5	56
Buffalo	56	40	62	54
New York	62	48	65	58
Washington DC	65	47	66.5	57.5
Midwest	Avg High	Avg Low	Avg Mean High	Avg Mean Low
Minneapolis	55	37	61.5	52.5
Chicago	57	43	62.5	55.5
Kansas City	66	47	67	57.5
Pittsburgh	61	43	64.5	55.5
Columbus	63	43	65.5	55.5

*temp data is from USclimatedata.com

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HUNTER
CONTINUOUS INSULATION

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Average Annual Temps (continued)

West	Avg High	Avg Low	Avg Mean High	Avg Mean Low
Seattle	60	45	64	56.5
San Francisco	64	51	66	59.5
Los Angeles	72	56	70	62
Salt Lake City	63	46	65.5	57
Denver	65	36	66.5	52

Southwest	Avg High	Avg Low	Avg Mean High	Avg Mean Low
Dallas	77	52	72.5	60
Houston	80	60	74	64
San Antonio	80	58	74	63
Oklahoma City	72	51	70	59.5
Albuquerque	69	45	68.5	56.5
Phoenix	87	63	77.5	65.5

Southeast	Avg High	Avg Low	Avg Mean High	Avg Mean Low
Atlanta	72	53	70	60.5
Charlotte	71	49	69.5	58.5
Nashville	70	49	69	58.5
Orlando	82	64	75	66
Jacksonville	80	56	74	62
Miami	84	70	76	69

Evaluating the information nationally, the average mean low temperatures for major metropolitan areas across the US are above 50 degrees mean, and the average mean high temperatures range from above 60 degrees mean into the upper 70's depending on geographic region. Thusly, it is important to understand the definition of mean temperature in terms of R-value calculation. Redirection of conversation away from FTC mandated R-value measurement is a deliberate attempt to mislead and confuse which could result in improperly insulated buildings.