

# R-VALUE TESTING & MEAN TEMPERATURES

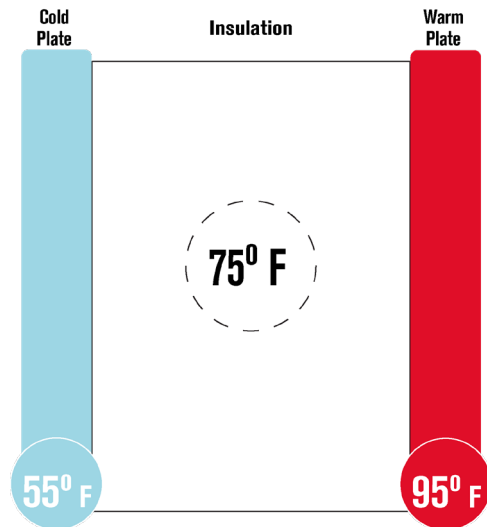
## APPLICABLE TO MOLDED POLYSTYRENE PRODUCTS

The International Energy Conservation Code (IECC) references the Federal Trade Commission’s (FTC) “R-value Rule” for determination of R-value for building code compliance, both residential and commercial. The R-value Rule dictates manufacturer R-value claims, as well as home insulation labels, fact sheets, advertisements, and other promotional materials in or affecting commerce. The FTC R-value Rule specifically requires R-values to be reported from tests conducted at a mean temperature of 75°F.

R-values for rigid insulations are determined by testing conducted in accordance with the applicable ASTM product standard. The R-values of EPS, XPS, Polyiso, and Mineral Fiber are tested using ASTM C518 at a mean temperature of 75°F as required by the R-value Rule. The appropriate product standard outlines the procedures used for product sampling and conditioning.

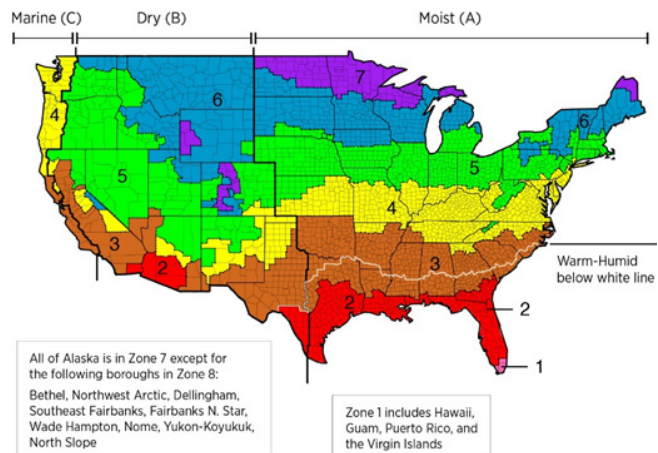
**FIGURE 1**  
R-value Test Setup at 75°F Mean Temperature

R-value testing consists of two metal plates on each side of the insulation with one plate being cold and one plate being warm. The testing configuration for R-value at a mean temperature of 75°F is shown in Figure 1. The cold plate is at 55°F and the warm plate is at 95°F, resulting in a mean temperature of 75°F.



The R-value testing required by a materials product standard is representative of testing conducted at specific and controlled conditions. This provides a baseline for consistent and fair product analysis and comparison. Building professionals understand the use of insulation is impacted by temperature conditions and climate zone where the IECC recognizes eight different climate zones across the U.S.

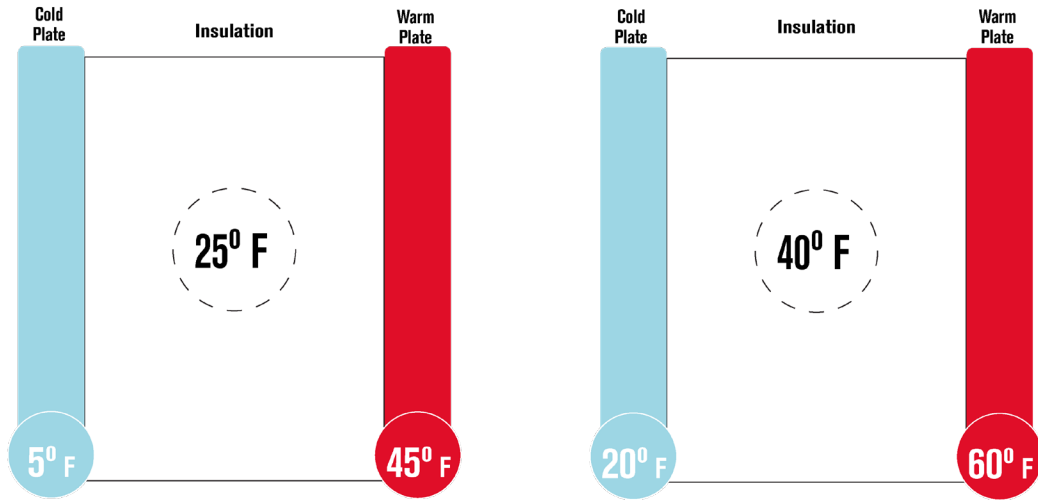
**FIGURE 2**  
U.S. Climate Zones - 2018 International Energy Conservation Code



In order to provide the most accurate R-value information to building professionals, product standards include R-values at additional mean temperatures. Since insulation performance is affected by temperature, additional R-values at 25°F and 40°F mean temperature are often available.

Figure 3 shows the R-value test configuration for obtaining R-values at mean temperatures of 25°F and 40°F mean temperature.

**FIGURE 3**  
R-value Test Setup at 25°F and 40°F Mean Temperatures



This bulletin provided an introduction on the testing of R-values at various mean temperatures. Atlas Molded Products literature provides R-values at mean temperatures of 75°F, 40°F, and 25°F to assist with the design throughout the wide range of climate zones and installation configurations.

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