



R-Value Chart

R-Value Factor

Thermal resistance is an index of material's resistance to the flow of heat. It is the reciprocal of the K or C-value.

$$R = \frac{T}{K} \text{ or } \frac{1}{C}$$

The higher the R-value, the better the resistance to the flow of heat (BTUs) and the better the insulation. R-values are usually reported for a stated thickness. R-values for different materials, or different thicknesses of the same material, may be added together to reach a total R-value for a system.

Typical Physical Properties of EPS Used in SBS Panels									
Properties	Units	ASTM Test	ASTM Designation						
			Type XI	Type I	Type VIII	Type II	Type IX	Type XIV	Type XV
ASTM Density	pcf (min)	C 303 or D 1622	0.70	0.90	1.15	1.35	1.80	2.40	2.85
Common Designation	pcf		0.75#	1#	1.25#	1.5#	2#	2.5#	3#
Thermal Resistance Values	at 75°F	C 177 or C 158	3.20	3.85	3.92	4.20	4.36	4.40	4.40
	at 40°F	C 177 or C 158	3.50	4.22	4.35	4.55	4.66	4.70	-
	at 25°F	C 177 or C 158	3.90	4.40	4.55	4.82	4.94	4.96	-
Compressive 10% Deformation	psi	D1621	8.0	12.0	16.5	20.0	28.0	45.0	60.0
Flexural Strength	psi	C203	18.0	29.0	35.0	42.0	55.0	75.0	95.0

Wood Structural Panel R-Values

Oriented Strand Board (OSB)

The thermal resistance, or R-value (in ft² - hr - °F / BTU), of OSB panels is listed below. Thicker panels have more insulating value; therefore R-values increase with increasing panel thickness. These values are listed in Table 2 of the Structural Board Association's "OSB in Wood Frame Construction," (U.S. Edition 1996/97).

OSB Thickness (inch)	R-Value
3/8	0.45
7/16	0.51
1/2	0.62
5/8	0.74
3/4	0.91

Plywood

The thermal resistance, or R-value (in ft² - hr - °F / BTU), of plywood panels is listed below. Thicker panels have more insulating value; therefore R-values increase with increasing panel thickness. These values are listed in Chapter 25, Table 4 of the 2001 ASHRAE Handbook published by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).

Plywood Thickness (inch)	R-Value
1/4	0.31
3/8	0.47
15/32	0.59
1/2	0.62
19/32	0.74
5/8	0.78
23/32	0.90
3/4	0.94
7/8	1.09
1	1.25
1-1/8	1.41

U-Value Factor

Overall coefficient of heat transmission, or the quantity which will flow through a specific building section composed of a number of materials one square foot in area during one hour when there is hot or cold side temperature difference 1° F.

$$U = \frac{1}{R_1}$$

Where R₁ = Sum of all the R-values in the section including air space and film. (R + R + R + R = R₁)