

Insulation & R-Values

"R-value" signifies the ability of a material to resist heat flow. The higher the R-value, the greater the heat flow resistance. For instance, it's more difficult for heat to pass through R-19 insulation than it is to pass through R-11 insulation.

Some materials are naturally better insulators than others. For example, a six-inch batt of fiberglass insulation has an R-value of 19, while an eight-inch concrete block has an R-value of 1.04. Glass, like concrete block, also has little resistance to heat -- a single pane of glass has an R-value of 1.13.

The following chart shows average R-values per inch of common insulating materials. Using this chart, you can determine the R-value of a particular amount of insulation from its thickness. For example, 8 1/2 inches of loose-fill mineral fiber insulation equals R-19. Because R-values per inch vary greatly between different insulating materials, always rate insulation by its R-value and not by inches.

R-Values Per Inch For Common Insulating Materials*	
Insulating Material	Avg. R-Value Per Inch
<i>Batts or Blankets</i>	
Mineral fiber (rock, slag or glass)	3.25
<i>Loose Fill</i>	
Mineral fiber (rock, slag or glass)	2.2
Cellulose (milled paper and wood pulp)	3.4
Vermiculite, exfoliated	2.13
Perlite, expanded	2.7
<i>Rigid Board and Slabs</i>	
Expanded polystyrene, extruded (cut-cell surface) and molded bead-type	4.0
Expanded polystyrene, extruded (smooth-cell surface)	5.0
Expanded polyurethane, refrigerant 31 exp.	6.25
Polyisocyanurate	7.04
<i>Building Board Sheathing, regular density</i>	2.64

NOTE: Styrene and urethane foams may present smoke- and flame-spread problems if improperly used. Look for UL approval for cellulose. Untreated cellulose is highly flammable.

*R-values from the ASHRAE Fundamentals Handbook. The values given are average R-values. If needed, ask insulation manufacturers for the R-values of insulating materials not listed above.

The table below lists R-values for commonly available thicknesses of residential ceiling, wall and floor insulation.

Insulation Type	Inches Needed For:				
Ceiling Insulation	R-11	R-19	R-22	R-26	R-30
<i>Batts or Blankets</i>					
Mineral fiber (rock, slag, glass)	3.5	6	6.5	8	9
<i>Loose Fill</i>					
Mineral fiber (rock, slag, glass)	5	8.6	10	12	13.6
Cellulose	3.2	5.6	6.5	7.6	8.8
Frame Wall Insulation	R-11	R-19			
<i>Batts or Blankets</i>					
Mineral fiber (rock, slag, glass)	3.5	6			
CBS Wall Insulation	R-3	R-5			
<i>Batts or Blankets</i>					
Mineral fiber (rock, slag, glass)	.75	1.5			
<i>Rigid Board</i>					
Polyisocyanurate	.5	.75 *			
Expanded Polystyrene (molded bead-type)	1.0	1.5			
Floor Insulation (suspended frame floors only)	R-7	R-11	R-19		
<i>Batts or Blankets</i>					
Mineral fiber (rock, slag, glass)	2	3.5	6		
*.50 with 3/4" dead air space					

Progress Energy's minimum recommendations for house insulation are R-19 or R-30 in ceilings (R-11 if space does not permit R-19), R-11 in frame walls, R-5 in CBS walls and R-11 in floors (suspended frame only).

Progress Energy offers a variety of services that can help you save money and valuable energy resources. Our family of [Home Energy Improvement](#) Solutions is designed to work together, making it easy for you to pick and choose those services that will best suit your personal energy needs and lifestyle. [Contact your Progress Energy office](#) and a representative will be happy to provide you with more information.