ENERGY ANSWERS

Wall and Ceiling Insulation

Wall and ceiling insulation is an important part of the energy system of your home. Insulation works with other building components to maintain comfort while keeping the costs of heating and cooling down.

Lower Cooling Costs and Improve Comfort by Increasing Ceiling Insulation

With proper ceiling insulation, you can reduce the workload on your heating and cooling system, reduce your energy bills and keep your home more comfortable year round. If you live in an older home, you'll normally benefit from adding ceiling insulation. In most existing homes, adding wall insulation is expensive and usually does not reduce energy costs enough to justify the expense.

How You Can Tell If You Need Ceiling Insulation

You'll usually benefit from additional ceiling insulation, if:

- Your air conditioner works extra hard to cool your home.
- Your home heats up quickly after the air conditioner cycles off.
- You have comfort problems such as being too hot in the summer or too cold in the winter.

If you home was built:

Before 1979	The insulation is most likely well below minimum standards.
Between 1979-1984	The insulation is probably slightly below minimum standards.
After 1984	The insulation is most likely meets minimum standards.

The best way to determine if your home needs ceiling insulation is to visually inspect the attic. Using a ruler, measure the thickness of your insulation. The chart below estimates the R-value of your insulation based on the type of insulation you have.

Amount of Insulation Required for Different R-Values

Insulation Type		R-11	R-19	R-30	R-38
Loose Fill or Blown-in	Fiberglass	5"	8.5"	13"	16.5"
	Cellulose	3"	5.5"	8.5"	10.5"
Batts/Blankets	Fiberglass	3.5"	6"	9.5"	12"

Common Types of Insulation

The two most common types of insulation are loose fill or blown-in insulation (typically fiberglass or cellulose) and batts or blankets (fiberglass).

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Loose Fill and Blown-in Insulation – This can be poured or blown between and over joists and into closed spaces like finished walls. Properly installed, it fills all of the building cavities and often covers wood framing in the attic. Blown-in can be applied with an adhesive substance and sprayed directly on the unfinished stud walls.

Batts – This type is available in precut sections.

Blanket Insulation – This comes in continuous rolls. Both batts and blankets are usually made of fiberglass, but are also available in cotton.

The insulating characteristics of each type of insulation are somewhat different. See the chart on front page for typical R-values of different kinds of insulation.

Higher R-Values Equal Greater Energy Efficiency

The R-value measures insulation's resistance to heat flow. The higher the R-value, the more effective the insulation. For homes in Arizona's desert, Payson, Prescott and Douglas areas, APS recommends R-30 ceiling insulation and R-19 wall insulation.

Example of Annual Energy Cost Savings With Increased Ceiling Insulation

Current Insulation Level	Increased Insulation Level R-11	R-19	R-30	R-38
None (well below standard)	$316	$350	$370	$377
R-11 (below standard)		$ 34	$ 55	$ 62
R-19 (slightly below standard)			$ 20	$ 28
R-30 (recommended standard)				$ 7

Note: Savings calculations are based on a typical 2000 sq. ft. home in the Phoenix area using the APS Standard Plan. Your actual savings may vary.

In the Flagstaff and Williams areas, we recommend R-38 ceiling insulation and R-19 wall insulation. It usually isn't cost effective to exceed these standards, and in some homes, you may not be able to add wall insulation.

The chart at left gives a comparison of the annual heating and cooling savings for different levels of ceiling insulation for a typical home in the Phoenix area.

Insulation Must Be Properly Installed to Achieve Its Rated R-Value

Insulation must be properly installed to obtain its rated performance. For example, three inches of properly installed insulation could be more effective than 12 inches of improperly installed material. The three most important factors to consider when installing insulation are:

- **No gaps or voids.** There should be no gaps or voids (areas without insulation) between the insulation and the building frame. Studies show that air gaps can reduce insulation effectiveness by over 30%.
- **No compression.** The insulation material should not be compressed. Compressed insulation can loose a substantial part of its insulating value.

For all types of insulation, care must be taken not to cover up attic vents or install over recessed light fixtures that are not designed to be enclosed with insulation.

For More Information Call the APS Energy Answer Line

For more information about saving energy, call the **APS Energy Answer Line in Phoenix at (602) 371-3636 or toll-free 1 (888) 890-9730**. Or visit our website at www.apsc.com.