

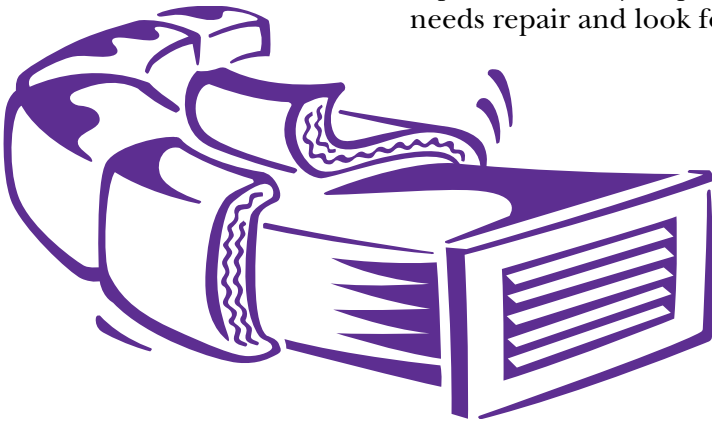
Duct Insulation

In Arizona, most air conditioning system ductwork is installed in the attic where temperatures can soar above 140 degrees in the summer. Cool air flowing through ducts is about 55 degrees, so if your ducts aren't properly insulated, you could be air conditioning your attic!

Poor duct insulation can cause these problems:

- Warm rooms and uncomfortable hot spots in the house.
- The cooling system works extra hard to keep rooms comfortable.
- Moisture and condensation on metal ducts can cause rust and provide a breeding ground for mold and mildew.

If possible, visibly inspect your duct insulation. Check to see if your duct insulation needs repair and look for thin spots or areas with no insulation.



Insulating Ductwork

If you suspect your ducts need insulation or the duct insulation you have needs to be repaired, contact an **APS Qualified Contractor**. A contractor can help you determine if it's practical to add insulation to your ducts.

An APS Qualified Contractor can also help you decide if duct repairs and insulation can be done at a reasonable cost. If so, you'll save money on energy bills and improve the overall comfort of your home.

Check for Air Leaks

Have a qualified contractor check your ducts for leaks. Air leaks waste energy, cause comfort problems and make your system work harder to keep your home cool. If you can see excessive dirt build-up on your duct insulation, you probably have air leaks. Insulation doesn't block leaks in your ductwork – it merely covers them from view.

If you're having your ducts insulated, be sure to have all joints and fittings sealed with mastic duct sealant to eliminate leaks. See the Energy Answers fact sheet on *Reducing Duct Leakage* for more information.

Higher R-Values Equal Greater Efficiency

An insulation's resistance to heat flow is measured as R-value. The higher the R-value, the more effective the insulation. The R-value of duct insulation depends on its thickness and density, and how much the insulation is compressed when installed. Compression reduces its R-value.

The two most common types of duct insulation systems are:

- **Blanket duct wrap for metal ducts and plenums** – APS recommends a minimum level of R-6.
- **Insulated flexible duct** (the insulation is included as part of the duct with R-values of 4, 6 and 8). – APS recommends at least an R-6.

The chart shows the insulating values of different types of duct wrap insulation.

Typical R-Values for Duct Wrap Insulation		
Density	Thickness	Typical R-Values
Low (0.75 PCF)	1.5"	5.0 – 5.1
	2"	6.7 – 6.9
	3"	10.0 – 10.3
Medium (1.0 PCF)	1.5"	5.6 – 5.7
	2"	7.4 – 7.5
High (1.5 PCF)	1.5"	6.0 – 6.2
	2"	8.0 – 8.3

Note: PCF stands for "pounds per cubic foot". For a typical installation, the installed R-value will be about 20% less than the rated value due to normal compression of the insulation during installation.

Proper Installation Determines Efficiency and Performance

Quality of installation has a big influence on the performance of duct insulation.

- Be sure that the insulation is securely fastened to the duct, and that all seams are sealed with duct tape.
- The insulation should fit snugly against the surface of the duct wall and completely cover all exposed surfaces.
- Insulation must not be compressed too tightly during installation or its insulating value will be reduced.
- If the outside cover of the insulation is accidentally torn or punctured during installation, it should be sealed with duct tape.

How Much Can Uninsulated Ductwork Cost You Each Year in Heating and Cooling Costs?

The energy cost associated with uninsulated ductwork depends on where the ductwork is installed, how hot the surrounding air is and how long the air conditioning system runs.

For a typical Phoenix area home with a 3-ton air conditioning unit, you could be paying as much as \$1 to \$3 per year in extra energy cost for each foot of uninsulated duct in your attic. A typical Phoenix area home has about 110 feet of ductwork. If uninsulated, the ducts can waste about \$150 to \$250 in cooling costs each year.

For More Information or a Referral to an APS Qualified Contractor

For more information on home energy efficiency, or a referral to an **APS Qualified Contractor**, call the **APS Energy Answer Line in Phoenix at (602) 371-3636 or toll-free 1 (888) 890-9730** or visit our web site at www.apsc.com. Be sure to ask for a contractor who specializes in duct system testing and repair.