

# Conservation *Wise*

*Energy Conservation: You CAN Make a Difference!*

## Saving Energy in Your Home: Insulation

*Nda-Agyima Addae-Mensah and Natalie Carroll,  
Department of Agricultural and Biological Engineering*



### Introduction

Inadequate insulation is one of the leading causes of energy waste in most homes. Air infiltrates into and out of your home around doors, windows, holes and cracks. Improving your home's insulation will save money and improve comfort by creating a more uniform temperature inside.

Insulating attics and around doors and windows can be a very cost-effective way to save energy costs. Your savings from adding insulation depends on many factors, though, including the age of your home, its current insulation status, and the size and type of construction. In addition, the local climate and your family's living habits will also affect your savings. Follow the manufacturer's safety precautions carefully when installing insulation.

Insulation is typically available in the following forms:

- Blanket (roll and batt)—made of mineral fibers, such as fiberglass and rock wool
- Loose-fill insulation—made of fiberglass, rock wool, or cellulose in the form of loose fibers or fiber pellets
- Rigid-foam insulation—made of polystyrene, polyisocyanurate or polyiso, and polyurethane, which are usually more expensive but are effective
- Form-in-place insulation—blown around into cracks, such as door frames.



### What Should I Do?

#### Attics

- **Clean or install** (if missing) **attic vents** along the entire cavity to help ensure proper airflow from the soffit to the attic.
- **Add insulation to your attic.** In the United States, use insulation with values of R-30 to R-60 in the attic for maximum comfort.

#### Doors

- **Use pliable sealing gaskets on doors and thresholds to eliminate air leakage in entryways.**
- **Install new doors if:**
  - you cannot maintain a constant temperature in the home;
  - your energy bills are unusually high for your locale and living style;
  - you are bothered by significant noise levels entering through walls and doors; or
  - your home was built before 1980. (*Only about 20% of homes built in the U.S. before 1980 are well insulated.*)

*These publications were developed with assistance from the Purdue Extension Energy Conservation Team*



### Pipes

- **Insulate water pipes** that pass through unheated or uncooled spaces (for example, attic or crawlspaces). Use foam (minimum of ½-inch thick) or fiberglass (minimum of ¾-inch thick) insulation.

### Water Heater

- **Insulate your water heater** if it is warm to your touch to save 4–9% of your water heating costs. (If your tank is not warm when you touch it, then it is already adequately insulated.)
- **Consider installing a drain-water heat recovery system**, when purchasing a water heater, for a potential savings of 25–30% in water heating costs.

### Heat ducts

- **Seal duct joints and seams** to keep air from leaking out of the ducts. Use UL-181b certified duct tape with standard fiberglass bolts and rigid foam. Other duct tape will dry up and lose its adhesion over time.
- **Insulate heat ducts that pass through unheated spaces.**

## Where Can I Learn More?

- Insulation Fact sheet, U.S. Department of Energy, [www.ornl.gov/sci/roofs+walls/insulation](http://www.ornl.gov/sci/roofs+walls/insulation)
- Energy Savers website, U.S. Department of Energy, [www.energysavers.gov](http://www.energysavers.gov)
- ENERGY STAR website, U.S. Environmental Protection Agency and Department of Energy, [www.energystar.gov](http://www.energystar.gov)
- Energy Efficiency and Renewable Energy, U.S. Department of Energy, [www.eere.energy.gov](http://www.eere.energy.gov)
- American Council for an Energy-Efficient Economy, [www.aceee.org/consumer/](http://www.aceee.org/consumer/)

## References

Consumer Resources website, American Council for an Energy-Efficient Economy, [www.aceee.org/consumer/](http://www.aceee.org/consumer/) (accessed 07/25/2010).

*A Do-It-Yourself Guide to Sealing and Insulating with ENERGY STAR®: Sealing Air Leaks and Adding Attic Insulation* (May 2008 version), [www.energystar.gov/](http://www.energystar.gov/) (accessed 07/13/2010).

Insulation and Air Sealing section, Energy Savers website, U.S. Department of Energy [www.energysavers.gov/your\\_home/insulation\\_airsealing](http://www.energysavers.gov/your_home/insulation_airsealing) (accessed 07/13/2010).

Insulation fact sheets, U.S. Department of Energy, [www.ornl.gov/sci/roofs+walls/insulation](http://www.ornl.gov/sci/roofs+walls/insulation) (accessed 07/19/2010).

Tips: Insulation and Sealing Air Leaks, Energy Savers website, U.S. Department of Energy, [www.energysavers.gov/your\\_vehicle/](http://www.energysavers.gov/your_vehicle/) (accessed 07/14/2011).

Wilson, Alex et al., *Consumer Guide to Home Energy Savings*, 9th ed., 2007. Washington, D.C.: American Council for an Energy-Efficient Economy.