

Insulating and Air Sealing the Attic Weatherization

Shades of Green
Tool Bench



You can vastly improve comfort and energy use in both hot and cold climates by adding insulation and by sealing unintentional cracks, openings, and venting where needed to control air movement. In warmer climates, the installation of radiant barriers in the attic may help reduce cooling costs when combined with attic weatherization.

How It Works

R-values in insulation measure the ability of the insulation to trap air and prevent heat transfer from air movement. This is why insulation works best with air sealing. High R-values of R-30 or more in the attic are good. Even relatively new homes might need more insulation. DOE suggests installing at least 10-12 inches of loose fill or batt insulation in the attic, covering the joists and filling the spaces between them. Joists and roof trusses act as thermal breaks, letting cold or hot air escape between the sections of insulated space. See the Department of Energy's [insulation calculator](#) to determine how much attic insulation is right in your zip code.



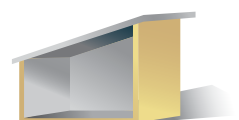
Getting Started

- **Always perform an energy audit first.** Air sealing and improving insulation in the attic and basement are among the most important first steps in weatherizing an older home.
- **If you see water stains or wet places in the attic, repair the roof before insulating.** Wet insulation is ineffective and can create mold.
- **Seal all unplanned gaps, cracks, and holes.** Attics require ventilation to remove moisture that rises from the living space below. Random gaps and openings don't help; they may let too much heat escape in the winter, and not enough moisture evaporate in the summer.
- **Control attic ventilation with gable vents or similar passive or mechanical fans vented outside or correctly placed passive vents near the edges of the roof line, such as soffit or ridge line vents.** Install soffit channels between each rafter extending to the roof-edge soffits. This will prevent loose fill insulation from either blocking or falling through these important ventilation openings.
- **Air seal all openings in the attic.** Depending on the size of the opening, use caulk, foam sealant, or rigid foam board beaded with caulk at the perimeter. Cover architectural openings into the attic (e.g., such as dropped ceilings, soffits, and bulkheads) with plywood and seal to the attic side of the ceiling.
- **If your older home has any dryer, kitchen, or other vents emptying into the attic space, re-direct the duct to the outside through an existing vent if possible.** Seal around the duct with caulk and insulate the duct.
- **Use high-temperature caulk or furnace cement to seal openings around chimney flues, stove pipes, or other high-heat elements.** Similarly, create a collar of metal flashing 3 inches away the chimney or flue and around recessed lighting cans, exhaust fans, or other heat-generating equipment to keep loose insulation from touching.

Accessible Attic



Cathedral Ceiling



Storey-and-a-half Attic



Flat Ceiling



Air sealing and moisture control will vary depending on the roof/attic style, but the R-values of the insulation you choose should conform to your climate and energy needs no matter what the attic "shape" is like.



Adding Insulation

Blowing cotton, shredded cellulose, or other “green” loose-fill insulation is usually preferable, and just as effective as installing loose or batt fiberglass insulation. Download and use the [Types of Insulation Quick Reference \(pdf\)](#) to determine the insulation materials and methods that would work best for your attic weatherization situation. Follow manufacturer’s guidelines for how to distribute the insulation. Measure the depth as you go and cover all joists. If the homeowner wants to use the attic for storage space, build up a deck platform on top of the joists to allow the proper insulation thickness under the storage area floor.

- If the attic already has some insulation, measure it. If it is dry and fluffy, simply add more insulation of the preferred type over the top until you achieve the desired R-Value. You will still need to air seal any openings first by moving the old insulation aside, but it can be repositioned when the seal is dry and new insulation added to the top.
- If the access to the attic is a pull-down stair, door in the knee wall, or other notoriously leaky opening through a conditioned living space, the attic hatch should be insulated and sealed. Hatches and pull-down stairs benefit from the addition of an insulated cover, while small gaps around the edge of the hatch can be handled with thicker weather-stripping tape such as that used for doors and windows. See [insulating attic openings](#) for more information.



Link and Learn

- Approaching the job of Attic Weatherization: http://www.energysavers.gov/your_home/insulation_airsealing/index.cfm/mytopic=11470
- Air Sealing for Attics: http://www.energysavers.gov/your_home/insulation_airsealing/index.cfm/mytopic=11390
- Insulating an Older Home: http://www.ornl.gov/sci/roofs+walls/insulation/ins_06.html
- Terrific step-by-step guide to DIY Attic Insulation, from Manitoba Hydro: http://www.hydro.mb.ca/your_home/home_comfort/3_attic_insulation.pdf
- Energy Star guide to attic and basement insulation: http://www.energystar.gov/ia/partners/publications/pubdocs/DIY_Guide_May_2008.pdf

Tips, Tools and Techniques

- Work from the perimeter toward the attic access opening
- Attach rulers to the joists in several parts of the attic to gauge the depth of the insulation, if using blown materials.
- If using batt insulation, use unfaced batts. Purchase batts that will fit snugly within the joists and push these down gently to the level of the top of the joists. Then run a second layer of batts perpendicular to the first layer, covering the joists.

FAST FACT

According to [Energysavers.gov](http://www.energysavers.gov), a 1/4-inch gap around the perimeter of an attic access can potentially leak the same amount of air as that supplied by a typical bedroom heating duct.

Source: www.energysavers.gov