

# Insulation

Insulate to Create a Thermal Barrier Between the Attic and Living Spaces



## SKILL SET

Do it yourself or hire a professional (required for foam insulation). Two people make the task easier. Familiarity with small hand and power tools is essential.

## SAFETY

This job requires working in unconditioned attic spaces, tight clearances and under task lighting. Wear a long sleeve shirt and long pants. Use a dust mask/respirator, gloves, safety glasses and kneepads.

## TOOLS

Utility knife, table or circular saw, caulk gun or expanding foam gun, measuring tape, lights, straight edge, markers, staple gun and specialty insulation equipment as needed

## MATERIALS

Foam/caulk/construction adhesive  
 Insulation – batts or loose fill  
 Sheathing to create blocking – OSB/plywood or foam board  
 Fasteners – screws or nails

## COST BENEFIT

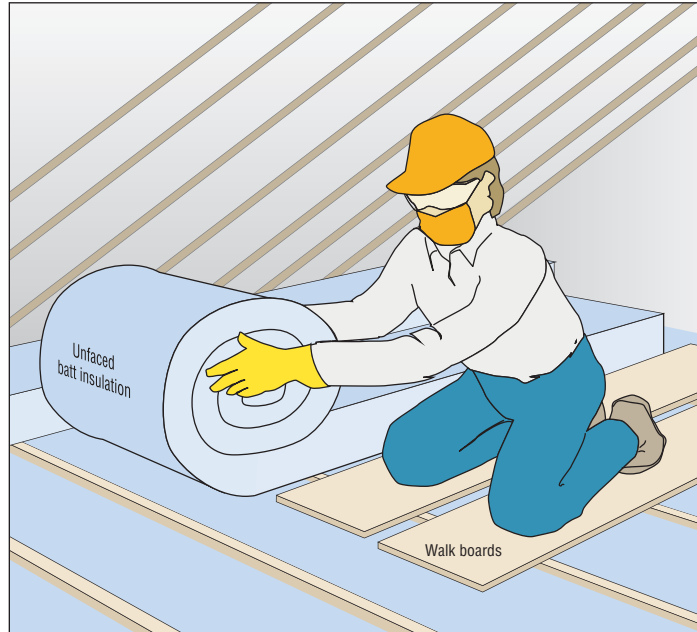
Materials are inexpensive ranging from \$0.50 to \$2.50 per square foot of installed area depending on the insulation method and materials selected.

### PRIORITY LEVEL

LOW MED HIGH

### SKILL LEVEL

DIY PRO



## Types of insulation and R-values

Insulation Type	R-value per inch
Loose fill	
Cellulose	3.2 – 3.8
Fiberglass	2.2 – 2.7
Mineral Wool	3.0 – 3.3
Batts	
Fiberglass	2.9 – 3.9

Ensure that joist cavities are full before adding insulation batts. Roll unfaced batts perpendicular to ceiling joists when adding batt insulation on top of existing batt-filled cavities. This helps to achieve the goal of complete coverage.

Reminder: Air seal before installing insulation

## Attic Insulation

Insulating ceilings, after air sealing, is one of the most cost-effective energy efficiency measures. In addition to reducing heat loss in the winter and heat gains in the summer, ceiling insulation improves comfort by bringing indoor ceiling temperatures closer to room temperatures and providing an even temperature distribution throughout the house. Attics over flat ceilings are usually the easiest part of a home's exterior envelope to insulate as they are accessible and have ample room for insulation. Attic ceilings may represent the largest heating and cooling losses in a home, so installing new insulation or improving insulation already in place should be one of the first steps towards improving the energy efficiency of your home after it has been sealed.

Many homes feature cathedral ceilings or have attic knee walls that require a different approach. For knee walls please see the *Attic Knee walls* recipe card. Insulating cathedral ceilings will likely require a professional.

## Assessing Existing Conditions

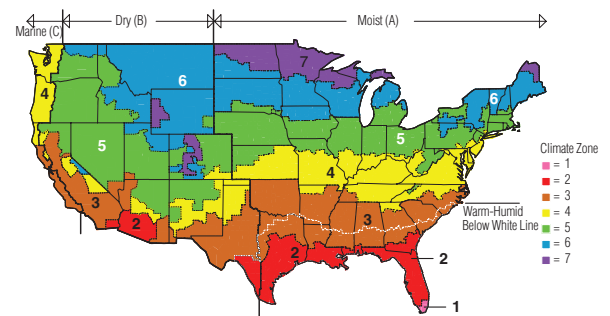
Before moving forward with an attic insulation project, it is important to determine the type and R-value of any existing insulation. Most attics

have either blown fiberglass, mineral wool or cellulose. To determine the R-value of existing insulation look to the insulation table. Existing batt insulation will have the R-value printed on the paper backing and packaging.

Once you've determined the level of insulation already in your attic, you can decide how much you would like to add. At a minimum try to meet the energy code prescribed levels for your climate zone as displayed below.

### Energy Code Standard - 2012 IECC

Climate zone	Ceiling R-values
1	30
2, 3	38
4, 5, 6, 7, 8	49



International Energy Conservation Code (IECC) climate regions

Example: If you have 6-inches of fiberglass, to meet code in Zone 3 you would need to add another 6-inches to make R-38.

## Objective

The goal of an attic insulation project is to reduce the heat flow across the attic ceiling surface. After proper air sealing has occurred, you want to make sure that new insulation levels meet code minimums. In addition, ensure the insulation coverage is complete and continuous and attic ventilation has been maintained. An effective installation ensures proper insulation and ventilation in the attic resulting in lower heating and cooling bills and increased comfort.

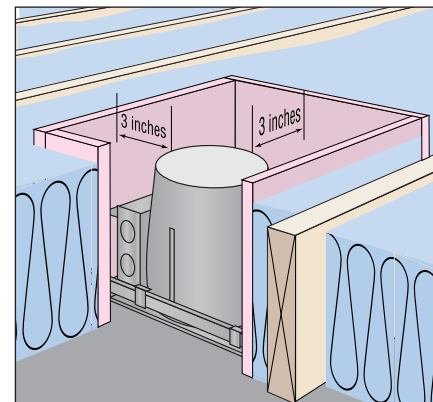
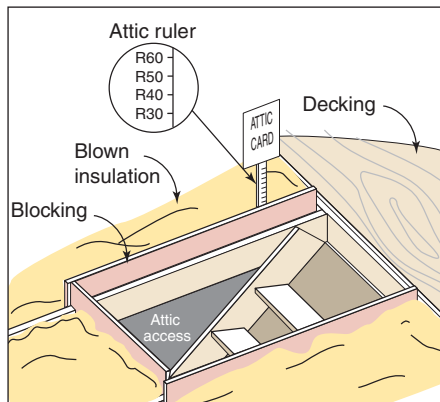
## Before You Insulate

- **Sealing** – Seal all attic-to-home air leaks, especially chases, dropped ceilings, wiring and plumbing penetrations, light fixtures and bathroom fans. Most insulation does not stop air flow.
- **Soffit venting** – Ensure attic ventilation is maintained at eaves through the installation of baffles or insulation plugs.
- **Blocking** – It may also be necessary to install blocking in certain areas before proceeding with your insulation project. Blocking ensures that insulation maintains clearances from hot surfaces and that any insulation you install stays in place at the proper depth.

## Choosing Insulation Type

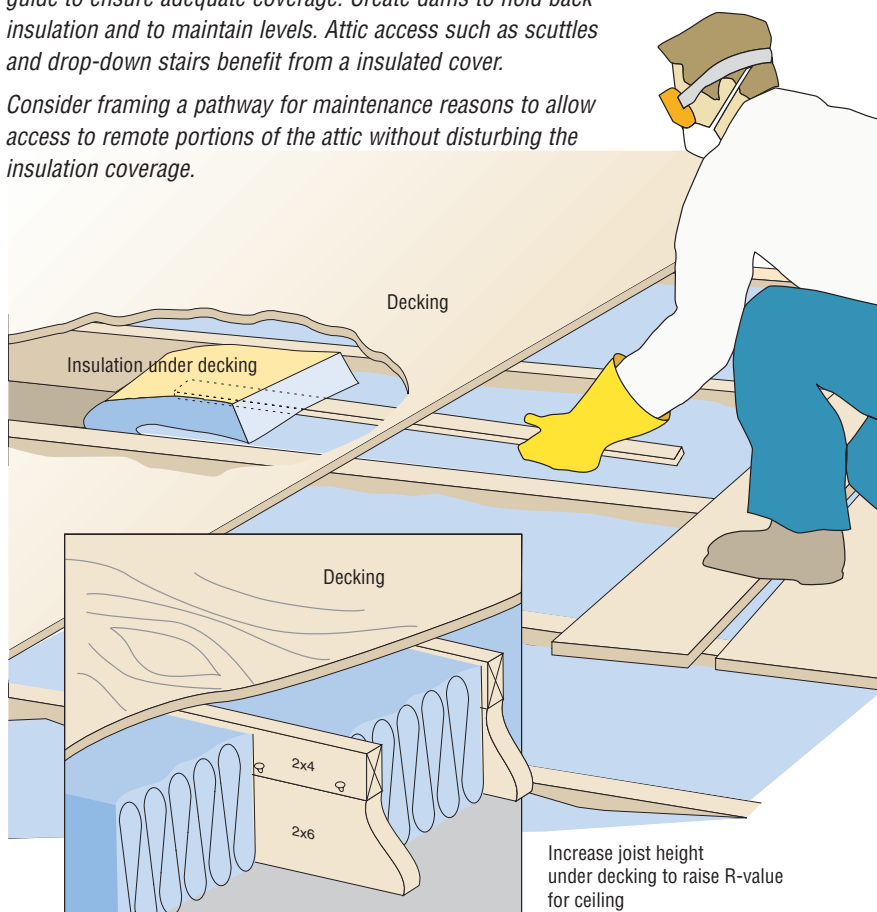
Either loose-fill or batt insulation can be installed on an attic floor. Batts with attached vapor retarders should be installed with the backing next to the ceiling. Blowing loose-fill attic insulation is usually less expensive than installing batts or rolls and typically results in better insulation coverage. Regardless of the insulation type chosen, insulation coverage should be continuous and complete.

- **Loose-fill insulation** - Follow the manufacturer's specifications (number of bags per square feet) to obtain complete coverage of the blown insulation at consistent depths and to avoid fluffing the insulation. This type of insulation requires an insulation blower machine to install the insulation.
- **Batt insulation** - Cover the top of the ceiling joists or the bottom cord of the truss with insulation. Obtain complete coverage of full-thickness, non-compressed insulation. Make certain batts completely fill the joist cavities and are fully in contact with the ceiling or existing insulation. Shake batts to ensure proper loft. If joist spacing is uneven, patch gaps in the insulation with scrap pieces. Do not compress the insulation with wiring, plumbing or ductwork (cut slits in the insulation if necessary).
- **Insulation levels** – select an insulation R-value that improves your existing insulation to at least current building energy code. See chart on code standards.
- **Attic storage** - Attic storage areas can pose a problem. If the ceiling joists are shallower than the depth of the insulation (generally less than 2x10s), raise the finished floor using 2x4s or other spacing lumber. Install insulation before nailing the storage floor in place.



Attic rulers are required for loose-fill insulation and are a helpful guide to ensure adequate coverage. Create dams to hold back insulation and to maintain levels. Attic access such as scuttles and drop-down stairs benefit from a insulated cover.

Consider framing a pathway for maintenance reasons to allow access to remote portions of the attic without disturbing the insulation coverage.



Installing insulation under existing attic decking requires some improvising to avoid removing the decking. Be sure to wear proper protective gear and clothing when installing any insulation. Install batt insulation with the vapor barrier down in attics with no insulation. If adding insulation on top of existing insulation, use batts without a vapor barrier backing or remove the backing.

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