

Insulating Exterior Walls

Retrofit Pre-existing Walls with Insulation

SKILL SET

Be sure you have the experience needed for these maintenance tasks. If you are in doubt, hire a contractor.

SAFETY

These upgrade tasks may require working on a ladder - use appropriate caution with ladders. Disconnect power sources when working around electrical outlets.

TOOLS

Screw driver and probe tool such as a plastic crochet hook. Ladder, drill and bits for drilling holes in siding/sheathing.

MATERIALS

Insulation materials as required. Rental shops will have blowers and can provide advice on how much insulation is needed.

COST BENEFIT

Adding insulation where there is none has energy cost savings in addition to improved comfort in the home.

PRIORITY LEVEL



SKILL LEVEL



Exterior Walls

Many older homes, usually those built before 1970, have uninsulated and poorly sealed exterior walls. Uninsulated walls can be a major energy drain for homes, especially in winter, and create moisture and comfort problems year-round. Insulating walls can be cost effective in most climate regions and offers many benefits:

- Increasing comfort by reducing cold interior wall surfaces
- Helping to prevent mold growth and condensation on interior wall surfaces by warming the wall
- Reducing noise transmission through exterior walls
- Saving energy and money
- Adding to the resale value of a home

Determine if Insulation is in Exterior Walls

Most homes have framed walls, using 2x4 wood studs. The cavity between studs should have insulation, usually fiberglass batts or loose-fill fiberglass, rockwool or cellulose.

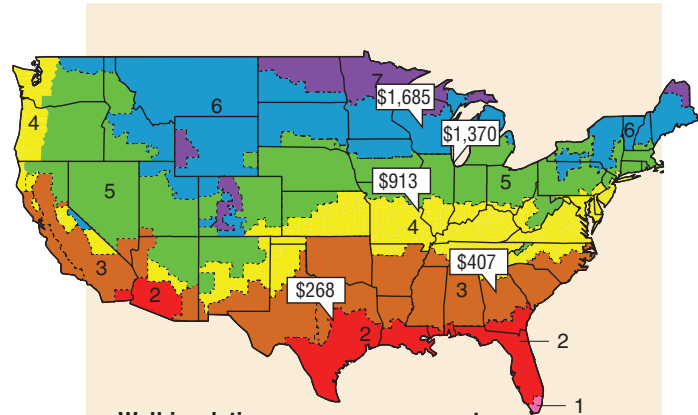
There are several methods to determine if insulation is installed in the exterior walls.

Outside method. Sometimes a piece of siding can be pulled up and a hole drilled into the exterior sheathing to allow visual inspection.

Inside methods. Probe for existence of insulation. One technique from inside the home is to find an electrical outlet on an exterior wall and cut off power to the circuit. Carefully remove the cover plate. Often there is a gap between the electrical box and the drywall or plaster. Carefully try to fish around in the gap and see if a piece of wall insulation can be extracted (see illustration).

A similar strategy can be employed by simply drilling a small, 1/2" diameter hole in an inconspicuously located portion of the exterior wall (such as inside a closet). Use a hook to snare or a flashlight to observe insulation. This may need to be repeated in several locations in case the home has been renovated over the years. Be sure to air seal any holes or gaps encountered or created by this effort.

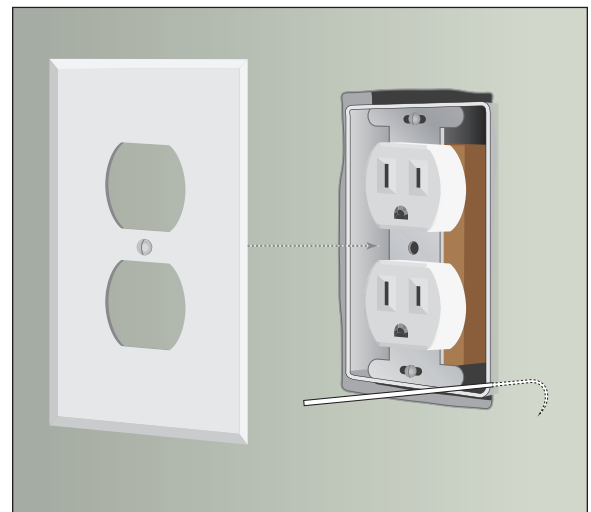
If cavity insulation is present, then it is not recommended to add additional insulation. Focus on sealing all the penetrations in the exterior wall as well as the connections between interior walls and the attic or crawl space or basement.



Wall insulation saves on energy costs.

Savings based on wall insulation installed versus no insulation.

Modeled annual energy costs, across climate zones in the continental U.S., show 20-30% heating and cooling savings for a 1,700 sq. ft. existing home with 13 SEER / 7.7 HSPF heat pump (\$0.12/kWh)



With the power off, using a non-metallic hook (such as a plastic crochet hook) and being mindful of wiring, carefully try to fish around in the gap and see if a piece of wall insulation can be extracted



Siding removed and holes drilled into sheathing.

Infrared Camera

Home energy auditors may have an infrared camera that can determine if the walls and other areas have insulation. Your local electric cooperative may have information on these services.

Dense-Packed Insulation

If the exterior wall cavities are empty, it is important to choose a product that will also reduce air leakage. Filling wall cavities with low density insulation has little impact on air leakage.

Today, a number of different products can be used to insulate existing wall cavities. Common materials are cellulose or fiberglass which are blown into the empty cavity at a high density to both block air leaks and insulate. Installing any of these materials at low density is less effective so it is usually best to work with a contractor with the proper blowing equipment. There are also foam insulation products that seal and insulate and can be pumped into the wall cavity.

Note that while dense-pack does insulate and reduce air leakage, the result is less heat flowing through the exterior wall which could change the ability of the wall to dry if it gets wet. It is important to minimize water entry either from exterior moisture leaks or interior water vapor into the wall for both insulated and uninsulated walls.

Insulate From the Inside or Outside?

Outside considerations

- The decision is usually based on the type of exterior wall finish, height of walls and access.
- Another critical decision is how to patch the holes drilled in the wall that are required for installing the insulation. If the exterior walls are brick or the interior of the house is to be painted, installing the insulation from the interior may be preferred.



Holes drilled through interior walls allow insulation to be blown into wall cavities

- Exterior installation is usually done for homes with siding and where the grade around the home is not too challenging for installers to work from ladders. A row of the siding is usually removed and holes drilled through the wall sheathing between each stud cavity. The holes in the sheathing can be easily patched and siding replaced.

Inside considerations

- Drilling holes in the interior finish material, such as plaster or drywall, will require patching and finishing.
- Insulating from the interior will generate dust inside the home, so furnishings must be covered or removed from the house.

For other exterior finish materials, such as stucco or paneling, consult with an experienced insulation contractor for the best approach. Also, discuss potential water issues when insulating walls, especially if there is not sheathing behind the exterior finish material. As with any home project involving cutting and sanding, ensure that the contractor is following lead-safe renovation practices if the home was built prior to 1978.

Interior Walls Matter Too

It may not seem obvious but interior walls can be leakier than outside walls, and are often more easily accessible. Sealing leaks at the top is usually best achieved from the attic side. However, in low-sloped roofs or inaccessible locations, it may be easier to seal the interior wall from the inside such as at electrical outlets and around the wall openings for plumbing fixtures and pipes. See *Attic Airsealing Recipe Card*.