

## Improving Existing Homes:

# Insulating Hot Water Heaters

**BUILDING AMERICA  
ENERGY PERFORMANCE BRIEF**

### When to Do This

When you have a water heater produced before 2004 or manufactured with less than R-24 insulation.

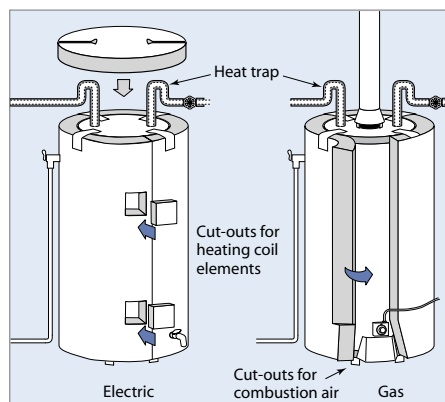
Water heating can account for 14% to 25% of the energy consumed in your home. Insulating your hot water heater is an easy and affordable way to reduce your water heating costs by 4% to 9%. Unless your water heater is already insulated to R-24 or was manufactured since 2004, you should add insulation. If you don't know your water heater's R-value, touch it. A tank that's warm to the touch needs additional insulation (DOE 2011b).

You can purchase pre-cut insulation jackets or blankets. Insulation jackets are designed to fit specific models of water heaters and simply slide on, while insulation blankets come in a single size and must be cut to fit your specific unit. Choose one with an insulating value of at least R-8. Some utilities sell them at low prices, offer rebates, and even install them at low or no cost. Your insulation kit will include insulation, belts, and tape. If directions are included, read and follow those.

When insulating your water heater, avoid setting your thermostat above 130°F. Higher temperatures can overheat the wires once the tank is insulated. For safety, never block any controls or valves and leave the thermostat access panel uncovered.

### Durability & Health

Insulating a water heater extends the life of the appliance by reducing demand.



Electric and gas water heaters require different approaches to insulation. Gas and oil-fired water heaters are more difficult to insulate than electric water heaters. Their installation may be best handled by a qualified plumbing or heating contractor.

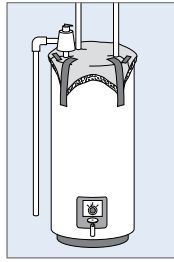
For safety, electric and gas water heaters require different approaches to insulation (Source: DOE).

## 2009 IECC

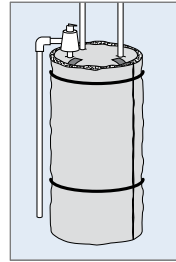
### Code Requirement for New Construction and Additions

No minimum level of external insulation is prescribed in the 2009 or 2012 IECC or IRC. Per 2009 IRC PC2801.7, in Seismic Design Categories D0, D1, and D2, water heaters should be anchored to the wall with straps across the upper third and lower third of the tank to prevent tipping.

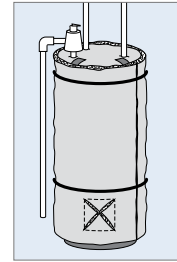
## HOW TO INSULATE ELECTRIC WATER HEATERS



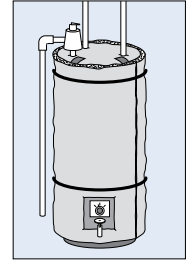
Steps 1-2



Steps 3-4



Step 5



Step 6

- 1 Cut the tank top insulation to fit around the piping on the top of the tank. Place it over the tank and tape the cut sections closed.
- 2 Fold the corners of the tank top insulation down and tape to the sides of the tank with heat-resistant tape.
- 3 Position the insulating blanket around the circumference of the tank. For ease of installation, position the blanket so that the ends do not come together over the access panels in the side of the tank. (Some tanks have only one access panel.)
- 4 Secure the blanket in place with the belts provided. Position the belts so they do not go over the access panels. Belts should fit snugly over the blanket but not compress it more than 15% to 20% of its thickness.
- 5 Locate the four corners of the access panel(s). Make an x-shaped cut in the insulating blanket from corner to corner of each access panel.
- 6 Fold the triangular flaps produced by the cuts underneath the insulating blanket. Repeat steps 5 and 6 for the rating/instruction plate.
- 7 If you are moving the water heater, you can place a piece of rigid foam insulation under the tank to reduce heat loss into the floor.
- 8 Replace or add seismic strapping as required by local code.

## References

DOE. 2011a. U.S. Department of Energy. Accessed 10/3/2011. *Installing an Insulation Blanket on an Electric Storage Water Heater*. [http://www.energysavers.gov/your\\_home/water\\_heating/index.cfm/mytopic=13080](http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=13080)

DOE. 2011b. U.S. Department of Energy. Accessed 10/3/2011. *Insulate Your Water Heater Tank for Energy Savings*. [http://www.energysavers.gov/your\\_home/water\\_heating/index.cfm/mytopic=13070](http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=13070)

## For More Information

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## HOW TO INSULATE GAS- OR OIL-FIRED WATER HEATERS

- 1 Wrap the insulation blanket around the sides of the tank, cut to size, and tape in place.
- 2 To allow intake air for combustion, do not insulate below the drain valve.
- 3 Cut any excess insulation from the bottom of the tank.
- 4 Cut insulation away from the pressure-temperature relief valve, thermostat, gas valve, pilot light, and burner area. For fire safety, make sure the insulation can not drop in front of these areas.
- 5 Never insulate the top of a gas water heater. Insulating this area can result in improper venting and a possible fire hazard.
- 6 Do not install insulation underneath gas or oil-fired water heaters, where flammable liquids may leak.

