BUILDING AMERICA
ENERGY PERFORMANCE BRIEF

Improving Existing Homes:
Insulating Plumbing Pipes

Insulating hot water pipes under kitchen and bathroom sinks and wherever else you have access to them is an easy way to save energy.

When to Do This

Any time.

Durability & Health

Insulating your water pipes reduces heat loss during water circulation, keeps pipes from sweating, and protects them from freezing during winter.

Building AMERICA
U.S. Department of Energy

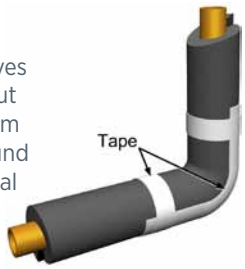
Insulating your hot and cold water pipes is inexpensive, easy to do, and will allow you to lower the temperature on your hot water heater by 2 to 4°F, saving you money (DOE 2011b). Begin by insulating the first 3 feet of pipes leading both into and out of your hot water heater; and then continue with any hot or cold water pipes that are accessible. Be sure to include pipes under your kitchen and bathroom cabinets, as well as those in a basement, crawlspace, attic, or garage. The insulation should be continuous, covering all sections of exposed pipes and fittings.

Pipe insulation is available in three forms: Tubular pipe sleeves, spiral insulation wrap, and fiberglass batts that can be taped around the pipes. If properly installed, all three can be effective.

How to Insulate Pipes Using Tubular Sleeves:

Tubular pipe sleeves are made from flexible polyethylene or neoprene foam, and come with a precut split seam that makes them easy to install by slipping them over the pipe and sealing. There are different diameters of sleeves available to accommodate the varying sizes of your pipes, so measure your pipes before purchasing. Carefully match the pipe sleeve's inside diameter to the pipe's outside diameter to ensure a snug fit.

1. Cut the pipe sleeve to length and wrap it around the pipe, making sure there are no gaps between sleeves.
2. Remove the paper strips covering the self-sealing, pre-glued seam and press the edges together, with the seam side facing down on the pipe.
3. Tape the seams with acrylic or aluminum foil tape to increase durability. If using more than one sleeve, tape the seam where the two sleeves meet.
4. Wire, tape, or clamp the insulation to the pipe every 1 to 2 feet to keep the sleeve from moving.
5. Use caulk or foam to seal the holes where pipes penetrate walls.



Tubular pipe sleeves come with a precut seam, making them easy to wrap around your pipes and seal (Source: DOE).

2009 IECC

Code Requirement for New Construction and Additions

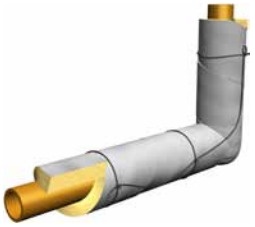
2009 IECC 403.4: All circulating service hot water piping shall be insulated to at least R-2.

2012 IECC R403.4.2: Insulation for hot water pipe with a minimum thermal resistance of R-3 shall be applied to … [most circumstances]. 2012 IECC R403.3: Mechanical system piping capable of carrying fluids above 105°F or below 55°F shall be insulated to a minimum of R-3.

How to Insulate Pipes Using Spiral Wrap or Fiberglass Batts:

Spiral insulation wrap can be made of fiberglass, foil, or polyethylene foam. Simply unroll the material and wrap it around your hot and cold water pipes. When working with fiberglass insulation, you may need to wrap your pipes in plastic after insulating to keep the fiberglass from absorbing moisture and reducing its R-value. Most hardware stores carry fiberglass insulation plastic, or you can purchase a fiberglass insulation that already has a moisture barrier attached to it. Be sure to wear gloves, goggles, and a dust mask when installing fiberglass.

1. Secure the end of the spiral wrap or fiberglass batt on the pipe with tape.
2. Wrap the insulation around the pipe in a spiral fashion, overlapping each successive layer by a ½-inch for tape or half the width of the batt insulation. Wrap batts as loosely as possible, as compressing them will reduce their R-value.
3. If using fiberglass insulation without a moisture barrier, wrap plastic around the insulated pipe and seal with tape to keep the insulation from getting wet.
4. Wire, tape, or clamp the insulation (and plastic covering) to the pipe every 1 to 2 feet to keep the insulation from moving.

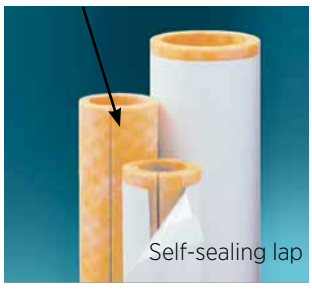


5. Use caulk or foam to seal the holes where pipes penetrate walls.

How to Insulate Steam Pipes:

If your house has a hydronic (steam or hot water) heating system, you can reduce unwanted heat loss by as much as 90% by insulating your steam distribution and return pipes (DOE 2006). Any surface over 120°F should be insulated, including boiler surfaces, steam and condensate return piping, and fittings. Use 1-inch-thick, heavy-density, resin-bonded fiberglass sleeves approved for steam or hot water heating systems, since other forms of insulation can melt. Seal and secure the fiberglass insulation sleeves with high-temperature tape. There are also removable insulation jackets that can be installed on elbows, tees, or other pipe fittings.

1. Measure the length of the pipe you are insulating and cut the fiberglass sleeve to match.
2. Open the pre-cut fiberglass sleeve by pulling on the release strip.
3. Fit the sleeve around the pipe and align the self-sealing lap over the sleeve.
4. Seal by rubbing firmly on the adhesive strip to seal the lap to the sleeve.
5. Wrap high-temperature tape around the pipe where two sleeves meet to minimize gaps in the insulation.



It is easy to install high-density fiberglass steam pipe insulation. Just wrap it around your hydronic pipes and seal (Source: National Institute of Building Sciences).

References

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