

## Weatherizing Your Home: Weatherstripping

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Weatherizing your home with weatherstripping can help reduce energy waste and bring down energy costs. This guide covers types of weatherstripping, material selection and installation.

Even in a well-insulated home, energy may be wasted through air moving in and out or infiltrating through the home's building shell or structure. Air leaks around doors and windows, attic hatches, window air conditioners, and through cracks and holes. Air pressure and temperature differences, wind, and "chimney effect" increase air infiltration. The chimney effect results from warm air rising up and out and pulling cold air into lower areas from outside. In a typical home, about 10 percent to 20 percent of the fuel bill is the result of air infiltration that is "accidental."

Weatherizing your home by caulking and weatherstripping can reduce energy waste, and pays you back with energy savings in usually one to two years. Weatherizing limits air infiltration and reduces drafts, insects, pests, dust and moisture entry, and noise. *Weatherstripping* reduces air infiltration around moving parts of the house, such as doors and windows. Check weatherstripping yearly to determine if it needs replacement.

Assess your indoor air quality before you apply weatherstripping. Plans to tighten the building shell should be done after analyzing the home's ventilation needs for any combustion equipment and pollutants. Managed ventilation and good air quality can be provided by mechanical ventilation systems. Additional ventilation may be needed to prevent back-drafting of gas equipment and combustion problems.

### Detecting Leaks

Inspect your home for leaks. Testing can be done visually or through hiring a qualified weatherization professional to conduct a blower door test and inspection. Professionals can determine the amount of leakage or "how tight the home is" and help to identify where the leaks are.

- On a cold windy day, close all doors and windows to the outside. Turn on vent fans or the dryer or use a fan in the window to depressurize or draw the air out of the home. Be sure you have an operating carbon monoxide alarm in case combustion equipment backdrafts. Use the back of your hand, a smoke stick, incense, a thread or a tissue to test around suspected leak areas such as windows, doors, and attic hatch or crawlspace entry. The smoke will move into the room wherever there are leaks.
- Insert a piece of paper at doorjamb, thresholds and in window channels. Close the door or window. If it pulls out easily, you have a leak and need to weatherstrip.

### Weatherstripping Materials

Most weatherstripping is made of metal, plastic such as vinyl or urethane, or latex, silicone, or neoprene rubber or a combination of materials. You may need several different materials and styles. Styles include interlocking, V-type or tension, pliable or rigid strips, tapes, and rolled or tubular. These materials vary in cost and durability. If a local business does not have the style you need, ask to have the item ordered from its suppliers.

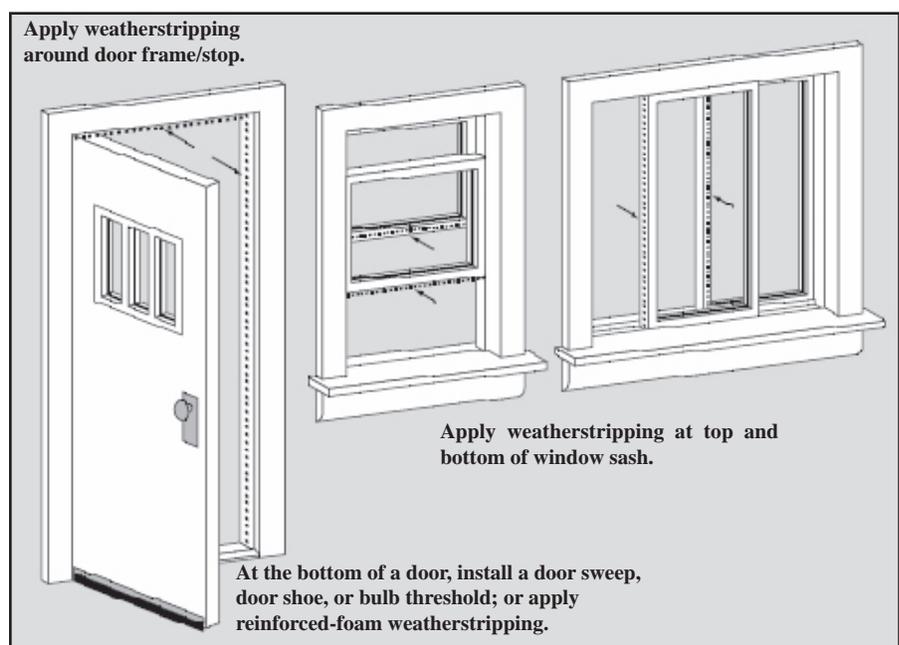
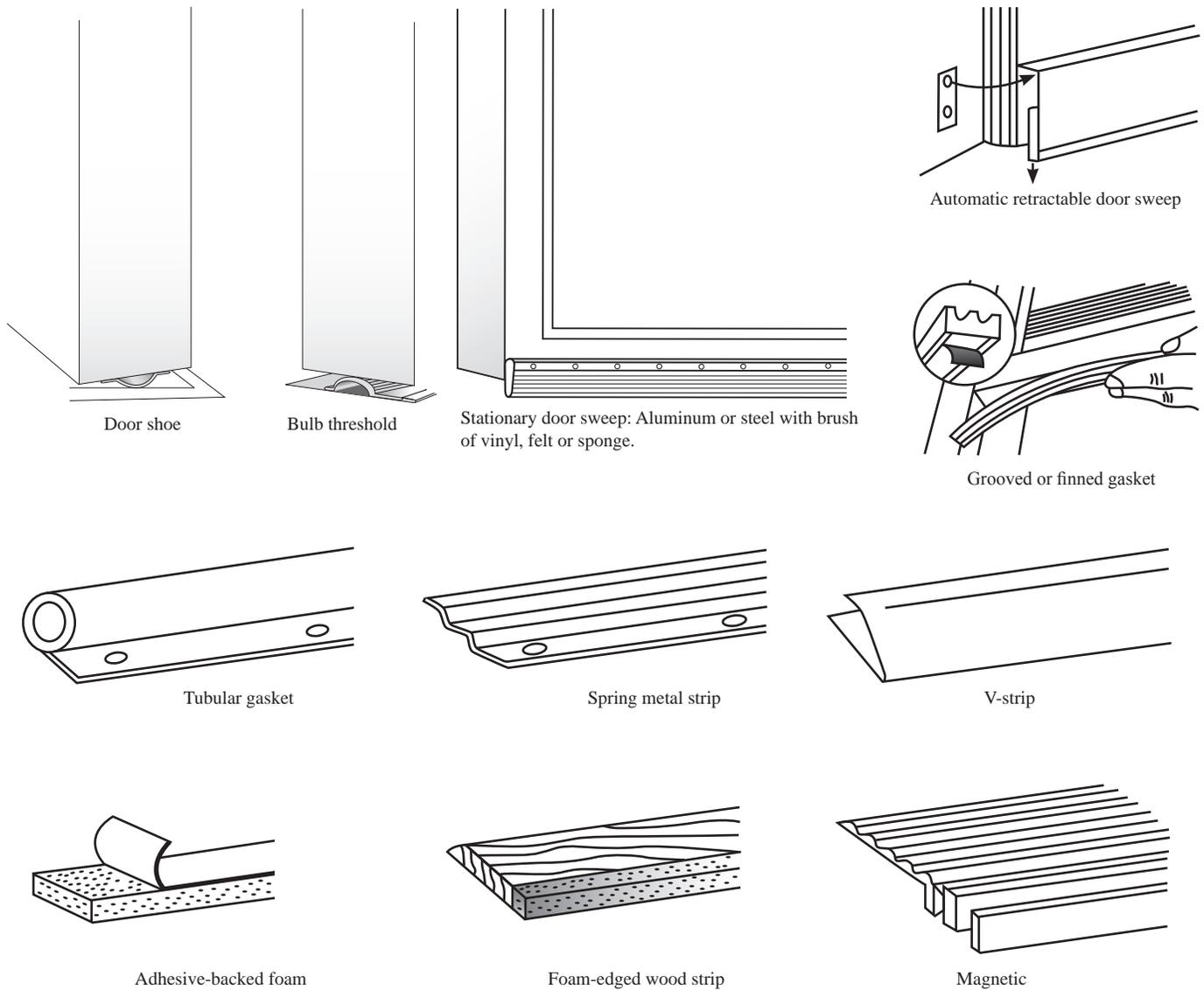


Figure 1. Apply weatherstripping around the movable joints of your doors and windows. National Energy Renewal Laboratory. U.S. Government



Source: Virginia Energy Savers Handbook

Figure 2. Types of weatherstripping.

- *Sponge or foam* is inexpensive, but not as durable. It may deteriorate when exposed to weather and is not suitable for applications where there is friction or abrasion. Neoprene or EDPM rubber and vinyl or silicone foam are more durable than latex sponge rubber or polyurethane foam.
- *Felt* is made of wool, polyester or cotton, relatively inexpensive, but not very durable. Do not use felt where it is exposed to the weather, moisture, friction or abrasion. All-wool felt is more durable, but more expensive.
- *Metals* include bronze, copper, stainless steel and aluminum and are very durable. Aluminum is frequently used for reinforcing other weatherstripping materials. Metal is often used in tension or V-seals.
- *Silicone* is heat and water resistant, withstands low temperatures and is very durable. It comes in tubular, foam tape or twin-fin sweeps.
- *Vinyl* is used in many types of weatherstripping. It is generally a durable product and resistant to moisture.

- *Gaskets* are used to seal between the foundation and sill plate as the home is built or remodeled. Install rubber gaskets around utilities and vents penetrating the shell and for special needs.

### Buying and Installing Weatherstripping

If existing weatherstripping is in poor condition, repair or replace a portion or all of it. For temporary situations or during the winter when windows are not opened, insert rope caulk into larger window gaps. Remove it in the spring.

Weatherstripping is sold by the linear foot or in kits. Measure around the door or window to be weatherstripped to determine the total length needed and add 5 to 15 percent for waste. Measure the width and depth of the gaps as weatherstripping comes in different widths and depths. Weatherstripping that is too thick may require too much pressure and interfere with the latch or locking mechanism on the door or window. If it is too narrow, it will not be effective. Be careful if you

<b>Weatherstripping Choices Type</b>	<b>Description and Common Materials Used</b>	<b>Use</b>	<b>Cost</b>	<b>Advantages</b>	<b>Disadvantages</b>
<b>Tension seal:</b> Self-stick plastic (vinyl) in a V-shape, or spring tension metal (bronze, copper, aluminum, or stainless steel.)	Self-adhesive plastic folded along its length or springy metal folded along its length in a V-shape strip to bridge gaps. Adhesive backed or nailed in place.	Inside track or channels of double-hung and sliding windows and top and sides of doorjamb.	Moderate to high. Depends on material.	Durable. Self-stick easier to install. Effective in stopping air infiltration - creates seal by pressing against sides of space. Hidden from view. Metals very durable.	Can be difficult to install - corners must be snug and fit well. Bronze should be nailed in place every 3". Can increase resistance in opening and closing windows and doors. Surfaces must be flat and smooth for vinyl.
<b>Felt:</b> Wool, polyester or cotton.	Plain or reinforced with flexible metal strip. Must be stapled, tacked or glued in place. Sold in rolls. Seals best if staples are parallel to length of strip.	Around door or window, attic hatches, fitted into a door jamb as door presses against it. Low traffic areas.	Lower cost.	Easy to install.	Lower durability; less effective at preventing air infiltration. Not for use where exposed to moisture, abrasion or friction. Wool felt more durable but more expensive. Visible in place. Needs tight compression.
<b>Foam tape</b> Flexible	Made from nonporous, closed cell-foam, open-cell foam, or Ethylene Propylene Diene Monomer rubber (EDPM). Foams may be poly-urethane, PVC, silicone, latex, etc.	Top and bottom of window sash, door frames, non-operable windows, attic doors, hatches	Low.	Easy to install. Works well when compressed. Good for blocking corners and irregular cracks. Closed-cell foams and EDPM and silicone foams more durable.	Self-adhesive may not adhere well in cold weather. Durability varies with type of material. Some may lose resiliency and effectiveness in one or two seasons. Use in areas of less wear and friction. Visible. Usually not long wearing.
<b>Reinforced foam</b> Rigid strip	Closed-cell foam attached to wood or metal strips.	Door or window stops; bottom or top of window sash; bottom of door.	Moderate to low	Effective sealer and does well in wind tests. Rigid. More durable than flexible foam tapes.	Can be difficult to install; must be sawed, nailed and painted. Visible.
<b>Tubular</b> Flexible or rigid strip	Vinyl, sponge or neoprene rubber, silicone, or urethane tubes with a flange along the length that is stapled or tacked into place. Also available on rigid strips.	Around doors. Window stop. Door or window press against tube gasket.	Moderate to high.	Effective air seal. Durable over time. Resists moisture. Usually nail or screw. Slots allow readjustments. Effective on uneven gaps.	Self-sticking tubular more difficult to install. Provides very good seal, but does require closing pressure. Rigid more difficult to install; accuracy in corners important.
<b>Rolled or Reinforced vinyl</b> Flexible or rigid strip	Rolled with gasket as flexible or attached to wood, plastic or metal strip. Tube may be filled with foam or hollow.	Door or window stops. Top or bottom of window sash. Rigid strips on bottom of door.	Low to moderate	Easy to install. Some types provide slot holes to adjust height. Comes in colors to reduce visibility. Effective air seal.	Self-adhesive pliable vinyl may not adhere well to metal or during cold weather. Visible.
<b>Pile seal or pile seal with fins</b>	Pile is compacted fibers of vinyl or polyester. Pile weatherstripping with plastic fins such as Mylar centered in pile. Flexible or rigid strip. Some adhesive-backed.	Aluminum sliding windows and sliding glass doors. U-shape or L-shape for door bottom.	Moderate to high.	Good durability. Moderate to good seal. Multiple fins better at sealing if one fin is damaged.	Can be difficult to install. Nail or screw. Visible. Replace total unit when fins are worn. May need to cut door bottom.
<b>Magnetic</b>	Works similar to refrigerator door gaskets. Magnet holds gasket against the door.	Top and sides of doors, double-hung and sliding window channels.	High	Very effective sealing.	
<b>Interlocking metal channels</b>	Door and frame interlock when closed.	Around door and door bottom.	High	Very good weather seal.	Difficult to install and align correctly. Needs professional installation.
<b>Door sweep</b>	Aluminum or stainless steel strip with brush or leaf of vinyl, silicone, neoprene rubber, polyester, sponge, felt, etc. Automatic sweeps retract as door is opened.	Bottom of doors. Good on uneven floors. Attach to inside of in-swing doors and outside of exterior swing.	Low to high.	Easy to install. Most are adjustable for uneven threshold. Automatic retracting sweep available to reduce drag on carpet and increase durability.	Visible. Can drag on carpet if not adjustable. Automatic require a pause after door is unlatched before opening.
<b>Door shoe or Door bottom</b>	Aluminum with gasket insert. Vinyl or neoprene rubber gaskets. Door presses against the gasket to seal.	Seal space beneath door.	Moderate to high.	Sheds rain when placed on the exterior of door. Durable. Can use with uneven opening. Some have replaceable gasket inserts.	Installation somewhat difficult. Door may need removal. Door bottom may need to be planed.
<b>Bulb or Saddle threshold</b>	Vinyl or rubber bulb and aluminum, wood, vinyl or fiberglass threshold.	Door thresholds	Moderate to high	Combines threshold and weather-strip. Good durability. Available in various lengths and heights.	Wear from traffic. Choose replaceable bulb threshold.
<b>Frost-break threshold</b>	Aluminum or other metal on exterior door and wood on interior door with door bottom seal and vinyl threshold replacement.	Seal beneath door.	Moderate to high.	Multiple materials mean less heat conduction. Effective. Threshold may be adjustable.	Somewhat difficult to install. Replacement needed when worn.

are painting near weatherstripping. Some types, such as foam and tubular or bulb vinyl, will lose their flexibility if painted or sealed with a finish.

Doors need weatherstripping to cover the sides and top of the door, and to fill the space between the threshold and door bottom. Select door thresholds with replaceable gaskets, bulbs or sweeps. Select adjustable sweeps. Attic and crawlspace hatches or doors need weatherstripping inside the back of the hatch or door. Weatherstrip around mail chutes and room air conditioner units. Weatherstrip doors between heated and unheated areas such as attached garages and the bottom of garage doors. Insert foam gaskets under outlets and switch covers after shutting off the power.

Most weatherstripping is easy to install. Self-adhesive weatherstripping requires a clean, dry surface. Other types are held by tacks, nails or screws, or have pre-punched holes for easier application. Weatherstripping should be applied to clean, dry surfaces in temperatures above 20°F. The material should compress when the door or window is closed and not interfere with opening and closing.

### Selecting Weatherstripping

There are many types of weatherstripping on the market, each designed for a different type of application. You may need several different types. Some factors to consider are:

- Resistance to wear by abrasion or friction.
- Exposure to weather. Some weatherstripping will deteriorate when exposed to weather and UV rays.
- Material to be weatherstripped. Will self-adhesive weatherstripping work, or is nail-in-place weatherstripping needed?
- Application type. Basic sealing types:
  - *Interlocking*: seals when door and frame interlock .
  - *Compression*: squeezes between surfaces to seal. Tubular weatherstripping provides a very good compression seal, but requires closing pressure.
  - *Sliding*: permits two surfaces to slide against each other.
- Gap size. Some types of weatherstripping are not suitable for large gaps.
- Gap evenness. Will you need a type that will adapt to uneven gaps?
- Appearance. Some types of weatherstripping are hidden after installation; other types show.
- Durability. A more expensive type of weatherstripping that will last can be the most economical choice.
- Ease of installation. Are special tools required?
- Replacements. Can the bulb portion be replaced on thresholds?

Some types of weatherstripping are attached to the frame, while others are attached to the door or window sash. Follow

the manufacturer's directions for the correct location. Weatherstripping is an effective way to reduce air infiltration around doors and windows. It also has the added benefit of helping to stop dust, dirt and insects from entering the house. For more information on ways to conserve energy around your home, contact the University of Nebraska–Lincoln Extension Office in your county or on-line [www.ianrpubs.unl.edu](http://www.ianrpubs.unl.edu)

To contact the Nebraska Energy Office: [www.neo.state.ne.us/](http://www.neo.state.ne.us/)

### Resources

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