Do-It-Yourself Insulated Window Shutters

EC 1241 • May 1986

This publication provides construction plans for an easy-to-build, pop-in, insulated window shutter. It is lightweight and easy to remove and will not permanently alter the appearance of your window. The shutter is made of rigid insulation board and is held in place by friction. A compressible foam gasket around the edges forms a tight seal and ensures a dead-air space between the insulation and the window pane. The window treatment can be covered with fabric to make an attractive shutter that matches your decor (Figure 1).

This shutter will provide an R (resistance to heat flow) value of between R-3 and R-14 depending on the type and thickness of insulation used. The cost per square foot will vary with the window size, the type and thickness of insulation, and the fabric. The average cost of a 1-inch insulated window shutter for a 3- by 4-foot window is approximately $8 plus fabric.

Tools and Materials

To build the shutter, you will need to have the following tools on hand:

- tape measure
- utility knife, serrated kitchen knife, or hacksaw blade
- scissors

You will also need the following materials:

- rigid insulation board
- foil tape
- rubber gasket
- long, heavy blocks of wood
- contact cement
- fabric and thread

Procedures

Measure the window

Your insulated window shutter should fit tightly to ensure energy savings. Measure the height of the window opening from sill to header (points A and B in Figure 2) on both the right and left sides. Measure the width from one jamb casing to the other (points B and C in Figure 2) at the top and bottom. Record these measurements and use them to decide how much insulation and foam gasket to buy.

Figure 1

Purchase the rigid insulation

There are several types of rigid insulation to choose from. Most can be obtained at building supply centers, lumberyards, or insulation suppliers. The most common types used in an insulated shutter are polyurethane and polyisocyanurate foam insulations. Common brands include "Thermax," "U-Foam," and "High-R." Polyurethane has an R (resistance to heat flow) value of between R-5.8 and R-6.25 per inch of thickness. Polyisocyanurate has an R-value of R-7 per inch. Another suitable type is extruded polystyrene,
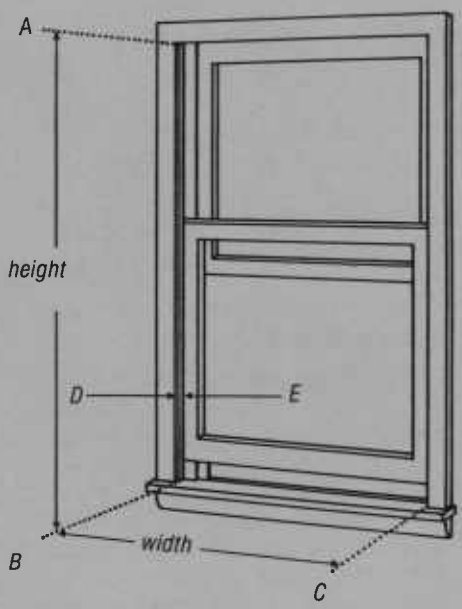

Figure 2

which has an R-value of R-4 to R-5.9. These insulation types have built-in vapor barriers to prevent condensation on your window panes. Molded polystyrene or high-density "bead board" is less suitable because it has an R-value of only 3.6 per inch and can be permeated by water vapor.

Most of these insulation boards are sold in 1-, 1½-, and 2-inch thicknesses. You can choose any thickness, as long as the insulation board fits between the outer edge of your window trim and the window sash. Therefore, before you purchase your insulation board, measure the depth of your window frame between points D and E as shown in Figure 2. Buy insulation board that is equal to, or less than, this distance.

The cost of insulation board varies, but a 1-inch-thick piece measuring 4 by 8 feet may cost between $12 and $18. High-density bead board is cheaper.

Before purchasing your insulation, you may want to read the note on rigid insulation board at the end of this publication.

Purchase the gasket material

Compressible foam ("foam rubber") is easy to find in home improvement centers and other variety stores. It usually comes in long white or green sheets that are 24 or 30 inches wide. The thickness should be the same as the insulation board you purchased.

Measure and cut the insulation board

Reduce the measurements you recorded above by 1¼ inches all the way around. (In other words, you will reduce both the height and width by 2½ inches.) Using these figures, measure and cut the rigid insulation board. The insulation should cut easily with a serrated blade, such as a kitchen knife or hacksaw blade. Polyurethane insulation will cut easily with a utility knife. To ensure a straight cut, move slowly and carefully. If you have to, piece the insulation board together with foil tape.

After you've finished cutting, wipe the insulation board with a damp rag to remove dust from the surface and edges.

Cut the foam gasket

Cut two strips of foam 1½ inches wide to the length between points A and B in Figure 2. Cut two more strips to the length between points B and C in Figure 2. The foam should cut easily with sharp scissors. However, if your gasket material is 1½ inches thick or thicker, try using an electric knife. Be careful to keep the strips 1½ inches wide.

Glue the foam gasket to the insulation board

Apply contact cement to the edges of the insulation board and to one side of the foam strips. It's best to do one strip at a time and let it dry before you apply the cement to the next strip.

Follow the directions carefully on how long to let the cement set up before you fasten the foam gasket to the insulation. Before applying the strips to the insulation, you will need to cut 1½ inches off one end of each strip so the strips will overlap as shown in Figure 3. Be sure to apply a small amount of contact cement to the corners of the gasket where they butt up against one another.
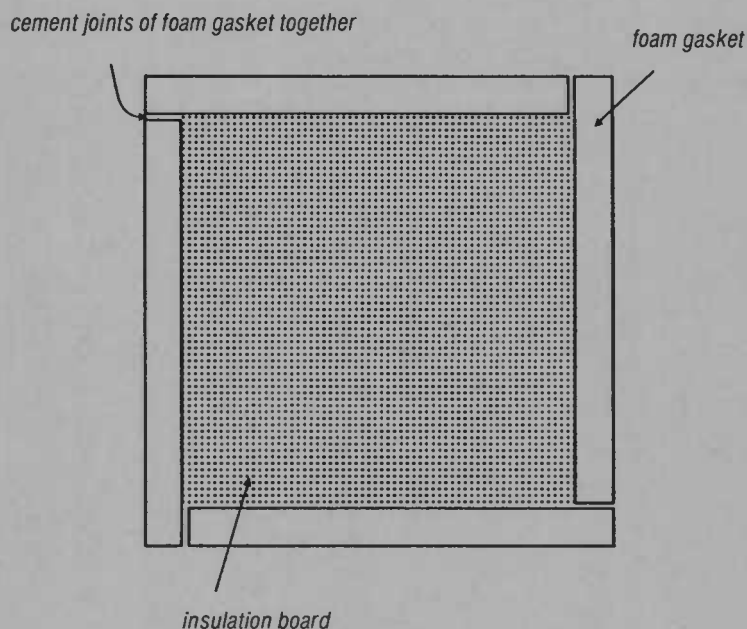

cement joints of foam gasket together

foam gasket

insulation board

Figure 3

Lay the window shutter flat and butt some long, heavy blocks of wood up against the foam. Use the wood to compress the gasket tightly against the insulation. This will hold it firmly in place while the contact cement dries.

Most adhesives have harmful vapors. Before applying the contact cement, carefully read and follow the directions and be sure to use it in a well-ventilated area.

Cut and sew a fabric cover

Your insulated window shutter will be more attractive with a fabric covering on both sides. It is best to use a tightly woven fabric that has been pre-shrunk. Most people prefer using a decorator fabric on the interior and white or off-white on the exterior side. Light colors look best from the street and fade less.

Cut the width of the interior side of the fabric cover (decorator side) equal to the width of the shutter, plus twice its thickness, plus 1¼ inches for the seam allowance. The height of the interior fabric cover should equal the height of the shutter, plus twice its thickness, plus 1¼ inches for the seam allowance.

The width of the exterior side of the fabric cover (white side) should equal the width of the shutter, plus 1¼ inches for the seam allowance. The height should be equal to the height of the shutter, plus 1¼ inches for the seam allowance (see Figure 4).

With the right sides together, stitch a ½-inch seam on the top and sides of the fabric cover. Leave the bottom open. Turn the fabric cover right side out and slip it over the window shutter. Fold the seam allowance at the bottom, and slip-stitch the bottom seam by hand. Note that the seam allowance is 1¼ inches but the seams account for only 1 inch. The extra ¼ inch will provide enough slack in the fabric so the gasket will not compress until the shutter is placed in the window.

Using and storing the insulated window shutter

Most people use insulated window treatments at night and in the daytime when they are away from home. This insulated window shutter should pop in easily and be held in place by the friction of the gasket.

Although many insulated window treatments have a vapor barrier, most of them let a little water vapor through. Therefore, it's important to remove your pop-in window shutter at least every few days, particularly in very cold weather. If there is a small amount of condensation on the glass, simply wipe it off.

Store your window shutter away from heavy foot traffic and where it won't get too banged up. You can lean it against a wall, slip it behind a sofa or under a bed, or mount it on the wall as a wall hanging. However you store it, keep it away from space heaters and wood stoves or any other place where it could catch fire.

This easy-to-build, pop-in window shutter will reduce your annual heating bill and provide increased comfort. It could also add an attractive decorator wall piece to your home.

Fabric Cover
interior (decorator fabric)

width = W + 2T + 1¼ inches
height = H + 2T + 1¼ inches

exterior (white fabric)

width = W + 1¼ inches
height = H + 1¼ inches

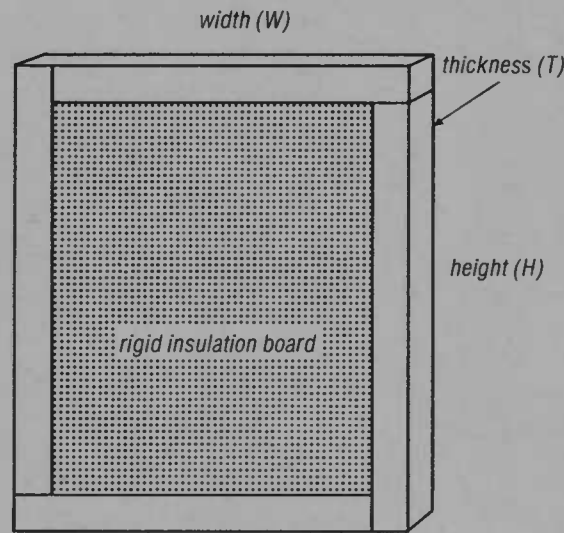width (W)

thickness (T)

height (H)

rigid insulation board

Figure 4

Note

Each of the insulation types mentioned is combustible. Your pop-in window shutter will not be more combustible than most of your household furnishings. In fact, it may be less flammable. However, foam, plastic, and other synthetic materials found in the home give off toxic fumes when burned. This would include your window shutter, as well as foam-padded furniture, carpeting, synthetic draperies and upholstery, and many other household objects. Therefore, to protect your family's safety, be sure to install smoke detectors in your home.

If you are concerned about adding combustible insulation board to your home, you can use semi-rigid fiberglass insulation board, available from an insulation supplier. The fiberglass is noncombustible and has an R-value of about R-3 per inch. However, it is heavier than foam insulation board. Because it is only semi-rigid, it will not be as durable as a foam insulation board, and will tend to bend in the middle. You can increase its durability and stability if you encase it in a wood frame made of screen moulding or other thin strips of lumber. If you use fiberglass insulation, be sure to cover both sides with either a foil or polyethylene vapor barrier.