

Thermopane Window Inserts



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Thermopane window inserts

Two big benefits:

- 1** They double the insulating value of a standard thermopane window or single pane window with a storm. This cuts heat loss through the window in half.
- 2** They noticeably increase the interior glazing surface temperature which makes you feel much warmer and more comfortable.

Economics

Materials cost of a 3' x 5' thermopane insert

16' of 1½" x ¾" pine	\$8.00
1/3 of an Ace window film kit	\$4.00
16' of clear packing tape	\$.15
16' of foam sealing strip	\$4.00
4 2½" long sheet rock screws	\$.20
Total cost is:	\$16.35

For Greenfield the annual degree days @ 65 °F is 7,200.

The energy lost during the heating season through a typical 3'x 5' thermopane window, (U value of .5), is:

$$15 \text{ ft}^2 \times .5 \text{ Btu/ft}^2 \cdot \text{°F} \cdot \text{hr} \times 7200 \text{ degree days} \times 24 \text{ hr/day} = 1,300,000 \text{ Btu}$$

Installing a thermopane insert will cut this in half, saving 655,000 Btu.

1 gallon of oil contains 138,000 Btu and assuming a heater efficiency of 85% only 110,500 Btu of that energy actually heats the house.

Fuel use is reduced by: $655,000 \text{ Btu} \div 110,500 \text{ Btu/gal} = 5.9 \text{ gallons}$

If oil costs \$3 per gallon this is a savings of $5.9 \text{ gal} \times \$3/\text{gal}$

$$= \$17.70.$$

Materials for a thermopane insert

- * 1 $\frac{1}{2}$ " wide by $\frac{3}{4}$ " thick primed pine
- * 2 $\frac{1}{2}$ " sheet rock screws
- * wood glue
- * heat-shrink plastic
- * double-sided tape
- * 2" wide clear packing tape
- * plastic for pull-tabs (Milk jug or plastic folder cover)
- * $\frac{1}{2}$ " x $\frac{3}{4}$ " open cell foam weather stripping

Tools needed to assemble one

- * someone with a table saw to rip the pine to size
- * chop saw to cut pine to length with square ends
- * tape measure
- * hair dryer
- * razor knife or scissors
- * scotch tape
- * electric drill with countersink drill and Phillips bit
- * staple gun or small nails for attaching plastic tabs

Step 1

Measure the interior height and width of your window opening.

Check that the diagonal measures are within 1" of each other.

NOTE: If your height is over 4 ft you should consider installing a horizontal wood member at the midpoint to stop any warping of the frame.



Step 2

Cut two pieces of frame stock equal to the opening width minus $\frac{1}{2}$ ".

Cut two more pieces equal to the opening height minus the sum of $\frac{1}{2}$ " plus two times the width of your wood frame pieces. (If you are using $1\frac{1}{2}$ " wide wood the value to subtract is $3\frac{1}{2}$ ".)





Though not necessary you may want to sand the frame and paint or varnish it.

Make sure it is fully dry before proceeding.



If you want to leave the frame natural I recommend wiping the wood with an alcohol dampened rag to remove all grease and oil. This will allow the double sticky tape to adhere well.

Step 3

Assemble the frame pieces together. Hold the pieces firmly together on a flat surface and drill counter sunk holes at each corner.

Apply wood glue to the end of the side pieces and screw the frame together. Make sure the pieces fit smoothly together with no misalignment.

Using a frame clamp as shown here is a great help. One screw at each corner is enough.

Counter sink drill bit



Step 4

Apply double-sided tape to face of each side of the frame.

Run the tape around close to the outer edge.

Make sure the film is very well adhered by running your finger around the tape holding a firm pressure.



Step 5

Cut a piece of plastic film about 2" wider and longer than the frame.

Stretch the cut film out on a clean flat surface and scotch tape the corners and middle of each edge.



Step 6

Peel the release tape off the double stick tape on one side of the frame and carefully lay the frame down on the film. Press it down firmly.

Peel up the scotch tape and flip the frame over. Run your fingers or palm around the edge ensuring the film is well adhered. Trim off the excess plastic around the edges with a razor knife.



**Repeat Steps 5 and 6 for the other
side of the frame.**

Step 7

Now apply clear packing tape around the perimeter of the window insert being careful to keep it centered. Fold it over onto each face of the frame.



Step 8

Cut two small pieces of plastic strip for pull tabs and fasten them to the bottom edge of the frame.



Step 9

Heat shrink the film on both sides using a hair dryer set on high.

Hold the dryer nozzle a few inches from the film and keep moving it in a circular motion.

Start in the center and work your way out for best results.



Step 10

Apply foam tape around the outside edge.

Cut the tape at the end of a side and start the next piece at the outer edge of the foam.



Putting your insert in place

First make sure the inside of the window trim is smooth. Polishing it with furniture wax will help the insert go in easily.

Squeeze in the top first and then push in the bottom. A flat frosting spreader inserted between the foam and window can help