

WEATHERIZING YOUR CHURCH WINDOWS

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One inexpensive way to reduce heat loss through windows is to make some indoor storm windows using two layers of that heat shrink plastic sold at most hardware stores for temporary use on windows. You can make a wooden frame to fit inside the window opening and then apply the plastic on both sides of the new frame, to form an air space in between.

The two layers of plastic provide greater heat savings and there is no need to apply tape to the permanent window frame, so there will be no damage to the paint on the permanent window frames. And by making separate indoor storm windows, the plastic can be reused for many years. The indoor storm windows can be inserted each fall, and then removed and stored someplace in the spring.

We are planning to make these for seven windows in the front (south side) of the Waterville U-U in Maine. Our windows are probably over 100 years old and six of them are wooden double hung windows with colored glass, about 55 x 68 inches. The seventh is a stained glass window with a single wooden fixed sash.

Indoor storm windows are relatively easy to make, and they fit in the window opening on the inside of the regular windows. The basic description is:

Make a simple wooden frame about $\frac{1}{2}$ inch smaller than the measured window opening. You can use $\frac{3}{4}$ inch thick pine about 2 $\frac{1}{2}$ inches wide for small windows, but the frame will need to be larger and stronger as window size increases. The plastic will pull on the sides when you shrink it, so the frame needs to be strong enough to prevent bowing of the sides.

Large windows may also need a cross brace or two, and maybe even some triangles for really large windows.

Look for "window insulation kits" at a hardware store or discount store. Most stores will have them in several different sizes. I was able to find a "Frost King" kit for windows up to 5 ft. x 17 ft. If you have windows larger than that, you can make the new indoor storms in two pieces.

Apply the heat shrink plastic on both sides of the frame, to form an air space in between, and then use a hair dryer to shrink the plastic to make it smooth. You will probably want to paint the frames before applying the

plastic. This will help the double sided tape to stick better and will also make the new windows look better. If you paint the frames for these indoor storm windows the same color as your permanent window frames, they will be less noticeable.

Apply ½ inch thick foam weather stripping all around the frame, without any gaps, and then slip the new storm windows into the window openings. The foam weather stripping will reduce cold air infiltration and prevent moisture condensation on the outer permanent windows. Small indoor storm windows will probably stay in place just by friction around the foam weather stripping.

For larger windows you will probably need to attach them firmly with a couple of long drywall screws, so they don't fall out on a windy day. This may depend on how much air leaks around your large windows on a windy day.

We have plastic covers (probably Lexan) outside of our big stained glass windows in the two sides of our building. These side windows are about 5 ft. wide by 10 ft. high. The Lexan covers have a row of five or six little round air vents at the top and bottom of each cover. I've been told that these air vents are there to allow some air flow by convection, and reduce the repeated cycles of heating and cooling from sunlight hitting the stained glass windows, which might damage the windows. So the Lexan covers are apparently there mostly to prevent damage to the stained glass windows, and are not so good for reducing heat loss.

The indoor storms on the front windows will add two closed air spaces and should work much better for reducing heating costs. We may build some indoor storms for the big side windows also, but we are planning to try them on the smaller front windows first.

I'm planning to use an indoor/outdoor thermometer, with the outdoor sensor on the end of a long wire, to monitor the air temperature between the indoor storm window and the colored glass for the first week or so, to see how much the air temperature goes up on a sunny day. We already have some damage on two of these windows, even with nothing on either the inside or outside.