

Stopping the Dust Pump

by Greg Fremstad

The following is a collection of information that I have amassed during the past 30 years I have been involved in framing, and I thought it important enough to share. I haven't found any papers or test reports on this subject, but if you know of any, please share them with the rest of us.

The typical frame with glass, mats, or spacers makes a very efficient diaphragm pump. Any movement of either the glass or the backing will pump air in and out of the frame. In fact, just turning a frame over on the fitting table will cause the air to move in and out of the frame.

Depending on which element of the frame package is more flexible, the glazing or the backing can act as the pump. Any air forced out will be countered by an equal amount sucked in (see Figures 1 & 2).

Unfortunately, this moving air gets past the edge of both the glass and the mat/backing package. (Even if you put a dust cover or tape on the back of the frame.) You spend all that time getting everything clean before you fit the frame and there's still dust. Where does it come from and how can you stop it?

Here are some typical hiding places for frame debris:

- The core of the outside edges of mats, foam board, or other backing boards.
- Any wood fibers, gold leaf, or paint flakes in the rabbet of a wood frame.
- Any glass chips created when fitting a metal frame.
- Freshly shredded glass cleaning rag fibers stuck to the edge of the glass (We never really do look there, do we?)

It's unrealistic to think that you can clean everything perfectly in the time allotted. Paint, taping, or otherwise sealing the rabbet on wood frames will undoubtedly help, but the pump is still working against you. A lot of framers solve this dust problem by tape sealing the glass/mat/ backing package before it goes into the frame (see Figure 3).

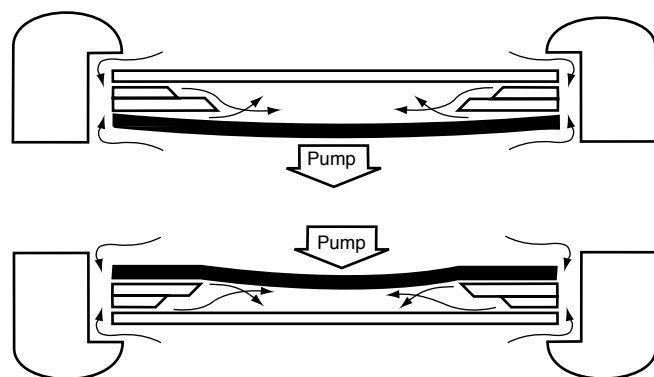


Figure 1: Here the backing of the frame is more flexible than the glazing and acts a dust pump, moving the air in and out of the frame.

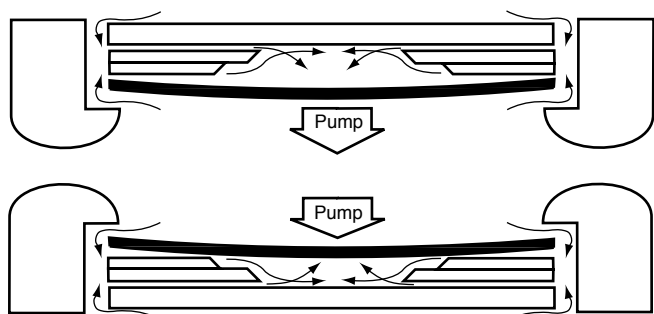


Figure 2: Here the glazing is more flexible than the backing and acts as the pump.

Stopping the Dust Pump

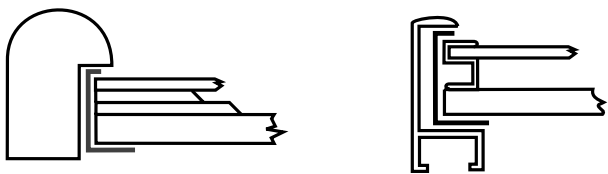


Figure 3: This is a cross section of tape sealed glass/mat/art/backing packages in typical frames. On the right, it is shown expanded for clarity.

There are several hidden benefits to tape sealing a frame. They include the following:

- Tape sealing will effectively turn off the dust pump.
- It will stop the intrusion of any additional outside dust, smoke, bugs, or pollution.
- Any particles coming out of the mats, foam board, or backing materials will get stuck to the sticky side of the tape.
- If done well it may even prevent glass cleaner from wicking up between the glass and the front mat. (Do you think your customers will ever learn?)
- Tape sealing slows down any rapid change of the humidity level of materials inside the frame. This will help prevent buckling of paper art and matboards.

Of course, there's always a flip side. Following are some of the arguments I've heard against tape sealing (and my counterarguments).

- Tape sealing takes too much time. (Not as much time as unfitting and refitting a frame to chase dust particles does.)
- If you ever have to open up a taped frame job, it's a real mess. (Not if you use a tape that doesn't tear as you remove it, since it will all come off at once.)
(Editor's note: See this technique described in the February 1996 Preservation Supplement, "The Frame: A Complete Preservation Package.")
- Some argue that humidity accumulates in a tape sealed frame over time. (I have not seen this phenomenon nor any scientific test to substantiate this claim. Have you ever opened an old frame and found it damp?)
- Tape sealing a frame will cause humidity to condense on the glass or art if the frame is exposed to heat.

(Tape or no tape, the results will probably be the same as there are no real forces that will act to remove humidity from the materials in an unsealed frame).

- Some believe that any bad stuff sealed into the frame cavity will harm the art. (I wonder what forces make the bad stuff migrate out of a frame that's not tape sealed. I also wonder which is worse; The bad stuff in the frame or pollution, bugs, dust, and smoke that could get into an untaped frame.)
- Some believe that the acrylic adhesive out gasses chemicals that are detrimental to the art in a frame. (Don't "Encapsulators" use acrylic adhesive? Do you use any other acrylic adhesives (ATG tape) within a frame cavity?)
- Tape is an additional cost. (This is more than offset by the labor saving of not having to open up just one frame a day. Besides, what is the fitting charge supposed to pay for?)

When you determine it is appropriate to seal a frame job, here are some tricks that make tape sealing a frame quick, neat, and easy:

- After cleaning all the components, stack up the clean glass/mat/art/backing package face-up. Position it over the edge of the table and hold it all aligned with pieces of tape diagonally across two corners as shown in Figure

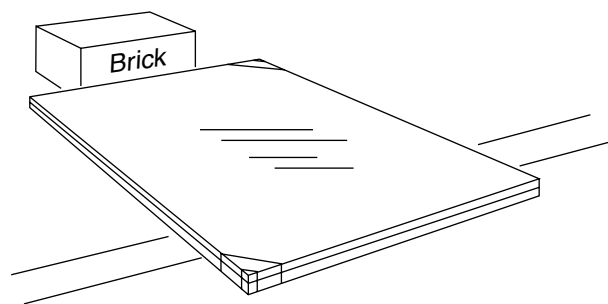


Figure 4: Hold the glass/mat/art/backing package aligned with tape across two diagonally opposed corners.

4. *(Editor's note: When using this method, it is recommended that the backing board should be made from, or contain, plastic to slow down any volatiles in the tape and keep them from migrating into the mat package.)*

- The brick is like a third hand. Don't worry about the tape across the corners as it will be easily removed during the last step.

Stopping the Dust Pump

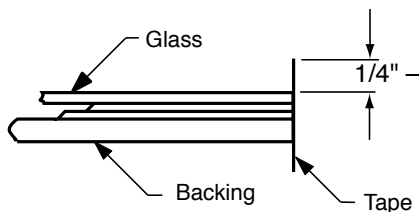


Figure 5: Apply the tape to the edge of the glass/mat/art/backing package, leaving about 1/4" of tape sticking straight up.

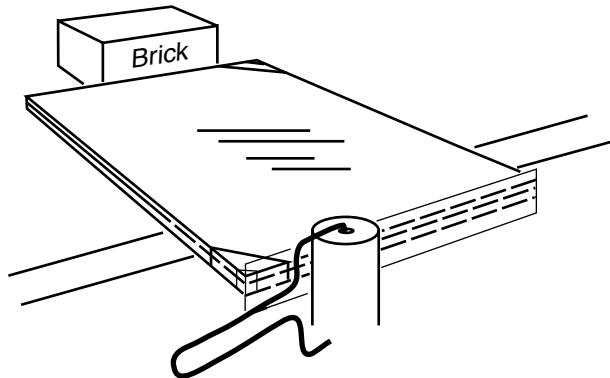


Figure 6: Use a soft rubber brayer to press the tape onto the edge of the glass/mat/art/backing package.

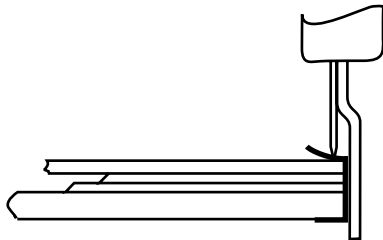


Figure 7: Roll the side, back, and just a little of the tape on the front of the glass. Cut through the tape about 1/16" from the edge with a dust cover trimmer.

- As you apply the tape around the edges, let about 1/4" stick up above the glass (see Figure 5). You can leave it standing straight up at this point. You don't have to be accurate yet, as it will be trimmed to 1/6" in the next step.
- Use your hand or a soft rubber brayer to stick the tape to the back and outside edge of the whole package (see Figure 6).
- Press very lightly on just the bottom of the 1/4" of tape left standing so it barely sticks to the front of the glass. (See Figure 7.)
- Cut through the tape on the front of the glass about 1/6" from the edge. Use a dust cover trimmer (Like a ProTrim knife) or a razor blade.
- Pull up the 3/6" or so of excess tape leaving a neatly trimmed edge. This 1/6" of tape left on the front of the glass will not show under the lip of the frame unless the frame allowance is too large or the rabbet width is too narrow.

That's it! No big deal! I believe that you have just saved yourself a lot of very frustrating time chasing dust and you've given your customer a better frame job. ■

Greg Fremstad is president of Frame Tek, Inc, which was founded in 1981 in Eugene, Oregon. With an engineering background, Fremstad has been involved in the framing industry since opening his first shop in 1970.