Acrylic Overlay Mounting

For certain delicate materials, mounting items directly against an acrylic sheet can be the right choice

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Consumers who frame their own family photographs and place them in direct contact with the glazing often find those photos stuck to the glass later because of condensation. The result can be mildew, mold, or stains. To prevent sticking and other damage that can result from placing glass in direct contact with the materials being framed, it is general practice to provide an air space between glass and the items in a frame. Spacing glass away from the items in a frame is the only way to accommodate condensation. The air space not only creates a physical separation between the glass and the art, but it also accelerates evaporation of moisture that could condense so that it may harmlessly escape from the frame as vapor.

This fragile sampler was framed by mounting it directly against acrylic glazing. Acrylic overlay mounting can work well except under environmental extremes, such as big changes in temperature or humidity.

At first glance, acrylic overlay mounting seems to violate this common principle of professional picture framing. When other mounting methods would exert harmful stress on a fragile or deteriorated item, however, an acrylic overlay may be the best mounting choice. The antique sampler depicted here is a good example. This technique can also be effective for flattening items that are heavily creased or wrinkled, such as an aged, brittle, heavily creased, or handwritten document.

Acrylic overlay mounting is the process of placing a paper or textile item under slight pressure between a padded, fabric-covered backing and a sheet of clear acrylic glazing. It involves no adhesive in contact with the item or changes in its condition. Since the entire area of an item is pressed between two surfaces, it provides good overall support. And when an acrylic overlay mount is appropriate for an item and is properly assembled, it is completely reversible and non-invasive. What makes an acrylic overlay mount less risky is the fact that clear plastic glazing has much better thermal properties—although there are several caveats in its proper application.

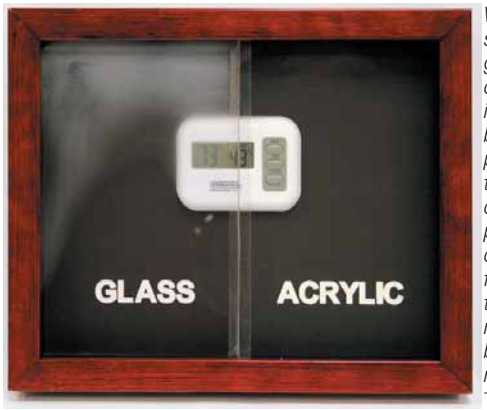
Acrylic vs. Glass

If glass needs to be separated from items framed to prevent damage from condensation, then why is it acceptable to press acrylic against an antique sampler? The main reason is that acrylic does not transmit heat as well as glass does. The plastic is a better insulator. Also, the acrylic used in typical framing is thicker than the usual glass, so

any heating or cooling would take longer to penetrate–even if its thermal properties were the same as glass. All this means that acrylic resists moisture condensation in a picture frame because it takes more time and more extreme temperature changes to reach the dew point.

Condensation

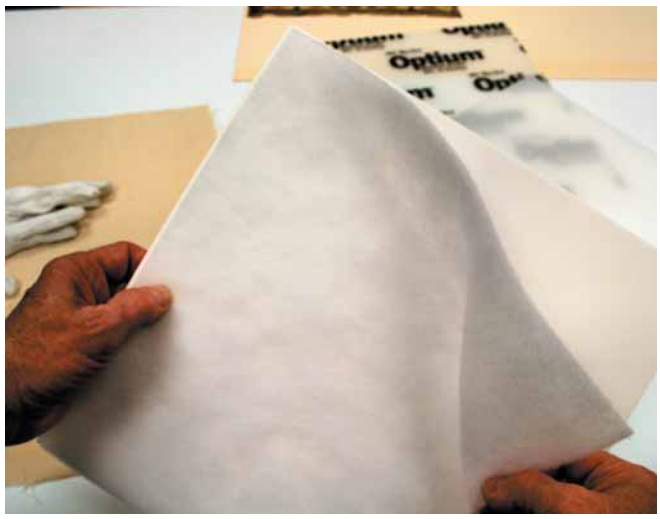
Condensation is a matter of physics and cannot be prevented under certain environmental conditions. When humidity is present, moisture forms on a surface when it is cooler than the air by a certain temperature differential. The more moisture in the air, the less temperature differential it takes. For instance, at 50 percent humidity, condensation occurs when the surface to air temperature differential is 20°F. At 80 percent humidity, condensation takes place with a temperature differential of only 7°F.



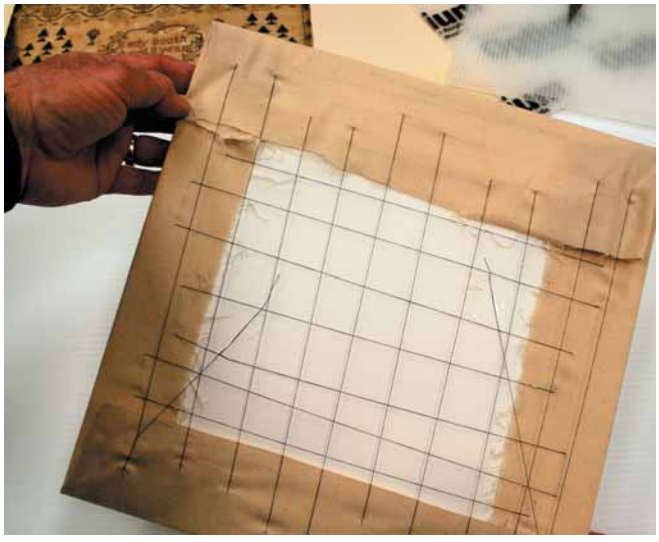
When the inside surface of the glazing becomes cooler than the air inside the frame by a certain temperature differential, it reaches the dew point—the point at which condensation forms. Notice that the glass has reached dew point but the acrylic has not.

Conversely, at 20 percent humidity, the temperature differential would have to be 43°F. These "dew points" are for 75°F air temperature, but the differentials are similar throughout the normal range of temperatures.

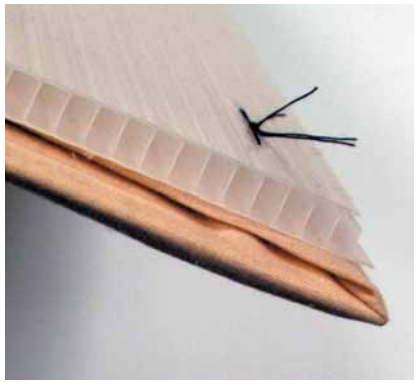
This means that condensation can develop in a picture frame when the glass surface is cooler than the air inside the frame. These conditions happen more often than most people realize. Because glass is a poor insulator and transmits heat rapidly, it often adapts to a temperature change faster than the air inside a frame. For example, on a humid, sunny summer day, a customer comes into an air-conditioned frame shop to pick up a completed framing project. She takes it from the 72°F shop, puts it into the trunk of her car at 120°F, and stops on the way home to do some shopping. A few hours later, after the frame has fully acclimated to the hot trunk of the car, she takes it into her air-conditioned house. The rapid cooling of the glass surface causes moisture to condense on the inside of the glass. Similarly, rapid cooling of glass could take place on a cold



The mounting board is comprised of four layers (from the bottom up): 4mm fluted polypropylene; 4-ply alphacellulose; polyester batting; and washed muslin.



Muslin was laced over the batting-covered 4-ply alphacellulose board, but it could have been attached to the board's back edges by fabric glue of acrylic medium, as well.



After lacing the muslin, the assembled board was attached to the 4mm fluted polypropylene board by four stitches of thread and, in turn, that assembly was stitched to the green suede background. There would be little or no stress on these connections after completion of the framing.

After completion of the prepared mounting board, the fragile sampler was centered on the muslin, ready for the acrylic overlay and then fitting and finishing. Acrylic overlay mounting involves minimal handling of the deteriorated needlework.

Measure the thickness of the assembled mounting package to determine the depth of spacers between the acrylic overlay and the solid backing board, in this case ¾". Hand-applied pressure compresses the polyester batting and provides slight tension between the sampler and the acrylic overlay. After removing masking from the acrylic and installing a spacer on the acrylic sheet's edges, final fitting is all that remains to be done.

winter day if a customer takes a frame from a warm gallery and puts it in a below-freezing trunk. For both these environmental extremes, tight packaging of the frame with insulating material reduces the problem considerably.

Another way to create condensation inside a frame would be to hang it opposite a west-facing window, where afternoon sun could warm the inside of the frame enough to reach the dew point. Again, high humidity inside the frame would contribute to the formation of condensation.

Caution

There is no way to beat physics. In conditions that create condensation—when the temperature change is fast or extreme enough—moisture can still form inside a frame with acrylic glazing. As a general rule, if a frame is displayed in a climate-controlled environment, framing designed with an acrylic overlay mount should be safe from condensation. But if the frame is transported, stored, or displayed in fast-changing environmental conditions that could cause the air inside the frame to reach the dew point, then an acrylic overlay mount would not be advised. The owner or custodian of framing with acrylic overlay mounting should be informed about the need for a climate-controlled environment.

Other Issues

Another concern with overlay mounting is mechanical damage, which is also a concern for other direct-contact mounting techniques, such as clear film encapsulation or a fine-mesh fabric overlay. If direct contact with an overlay mount would harm an item, another mounting method may be more appropriate. For example, an acrylic overlay could flatten a heavily textured needlework. Direct contact also could damage attached objects, such as buttons or bows or press them into the padded background.

If acrylic overlay mounting is considered for a paper item, such as a document, the very slight but constant rubbing of surfaces caused by environmental vibrations and normal expansion and contraction cycles might abrade deteriorated or raised inks or paints. Friable media, such as charcoal or pastel, would also transfer to the acrylic in direct contact, just as it would transfer to clear film in an encapsulation mount.

Preservation

Acrylic overlay mounting is not suitable for every project, but when it is appropriate, the technique works very well. It is a relatively non-invasive, completely reversible float mounting method that is fast and easy to construct with readily available materials. The overlay of acrylic provides excellent overall support and imposes no stresses, such as the tension of stretching, the localized stress of stitching, or gravitational stress from hinging. An acrylic overlay mount is also visually superior to most other mounting techniques.

Frame Design

This antique sampler shown here is in poor condition. Its fabric substrate is literally threadbare, and much of the stitching has disintegrated. The customer considered conservation treatment at my suggestion, but this textile is so far gone that treatment would cause substantial changes to its

appearance and the long-term benefit would be limited. So, the decision was to frame it as-is.

Because there are no perimeter margins, float mounting the sampler to show all of its edges was chosen. Normally, the needlework would be sewn to a sturdy background fabric, such as muslin, which would then be stretched. In this case, however, the weakened fabric probably would have been further damaged or its weave shattered by stitching it to muslin. The overlay mount provides support over the entire surface area of the sampler and eliminates most stresses on the deteriorated fabric.

Construction

The first step of the mounting process was to trim an alpha-cellulose board slightly larger than the needlework and sand the edges to prevent snagging or damaging the background fabric in contact with the board. If this had been a larger item, 8-ply or heavier board would have been used. But 4-ply was adequate for this job.

Polyester batting was trimmed to fit the board. The typical polyester quilt batting available from retail fabric stores would work, but the denser padding from archival material suppliers is preferable. Cotton batting would not be desirable because it compresses over time and loses its loft. It also provides yet another layer of cellulose to attract insects and moisture. The non-hygroscopic polyester batting remains stable and retains its loft over time.

Muslin, thoroughly washed and rinsed three times to remove sizing, covers the padded mounting board. Since the needlework has worn away over most of the area and is now almost transparent in some spots, the natural tan color provided an inconspicuous background. Muslin was laced to the back of the board, but a fabric adhesive or acrylic gel as a heat-activated adhesive could also have been used to assemble the fabric to the padded board.

After lacing the muslin to the padded board, a few stitches of thread were used to attach it to a piece of 4mm fluted polypropylene, trimmed smaller than the mounting board and given beveled edges. This added reinforcement and elevated the sampler off the background. To complete the preparation of the mounting board, that assembly was stitched to a solid background of green suede matboard, including a final backer/reinforcement of 8mm fluted polypropylene.

In constructing an acrylic overlay mount, it is important to create just enough pressure to compress the polyester padding to keep the item in place on the prepared mounting board. Excess pressure is unnecessary and might restrict movement during expansion and contraction cycles.

The next step was to measure the thickness of the entire assembly, from the suede background to the inside of the acrylic sheet, with limited pressure provided by hand. The thickness measured ¾", so a standard FrameSpace black spacer was used to provide precise depth and pressure on the sampler. Although the spacer is made to fit the edges of typical framing glass, it will also fit on the edges of the thicker Tru Vue Museum Optium acrylic sheet.

It was not necessary to seal this framing project, but keeping it tightly closed was still beneficial. After all of the components were cleaned and stacked together, Lineco's 1-¼" wide foil/paper Rabbet Lining Tape was adhered to the top of the acrylic sheet and the bottom of the final backer board to seal all the edges and create a semi-sealed frame package. This project could not actually be completely sealed, because neither the acrylic sheet nor the fluted polypropylene backer provides a gas-impermeable barrier.

Museum Optium acrylic works well with this mounting technique for several reasons. First, it provides 98 percent UV-filtering protection from light damage. Second, the optical coating process includes abrasion-resistant treatment, which avoids scratching or abrasion of the acrylic surface on both sides. Third, its optical coatings make it anti-static, eliminating the usual static charge associated with acrylic glazing. Visually, it is also clearer than any other readily available glazing and is nearly invisible.

The moulding selected for this project was Larson-Juhl 403-IS in the Imperial series. The style and decorative design are appropriate for the sampler, and its 1⅝" deep rabbet allowed plenty of depth to drop in the assembled package of framing components. When the framing was completed, the fragile, antique sampler seemed to float about ½" off the background. The optically coated acrylic and other mounting provisions are almost invisible, making this technique especially appealing visually. ■

James Miller, MCPF, GCF, founded his framing business, ArtFrame, Inc., in suburban Columbus, OH, in 1988, where he specializes in the preservation framing of art, heirlooms, and three-dimensional objects. Miller, who holds a Bachelor's degree in Business Administration, has served as chairman of the PPFA Certification Board, where he helped develop the MCPF exam, and has been chairman of the FACTS Education Committee. He is also the author of *The Complete Guide to Shadowboxes and Framing Objects*, published by PFM Seminars Books.