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Tip: An Easy and Cost-Effective Method for Making a Transparent Suction Platten

ABSTRACT

When it comes to paper conservation, two indispensable pieces of equipment is our suction platen/table and our light tables. Suction platens and tables are used for a variety of treatments including stain reduction and pulp fills. While incredibly useful, suction devices do have their limitations. For some treatments, like stain reduction, the object is typically face down on the suction device, preventing the conservator from seeing what is occurring on the most critical side of the object. But, what if there was a way to combine the functionality of a suction platen or suction table with the benefits of a light table at the same time? The "transparent" suction allows the conservator to see through and carefully observe their objects during treatment. This talk will present an easy and inexpensive transparent suction device that can be placed on a light table, combining the function of the suction platen or table with the benefits of a light table.

INTRODUCTION

At the University of Hawaii Hamilton Library Preservation Department one of most common forms of damage that the Paper Conservation Lab sees and is asked to repair is the use of ball point pen handwriting by patrons on virtually all types of material in the library's collections (fig. 1). For many, the approach for the removal of ball point pen from paper would be considered fairly routine. The protocol would be to remove as much as was possible by putting the material on some blotter and applying either ethanol or another solvent to the pen ink on a suction disk until no more ink is visible on the blotter. Once no more ink is visible on the blotter one could safely assume that there was no more soluble ink left, and that was as far as one could go. As the mechanism of the suction table is to allow the ink to pass through the paper into blotter underneath, the conservator would usually have the option of applying the solvent from either side of the sheet, treating the paper with the ink on it either 'face-up' or 'face-down' against the suction table. While both of these approaches can get good results, both approaches have problems.

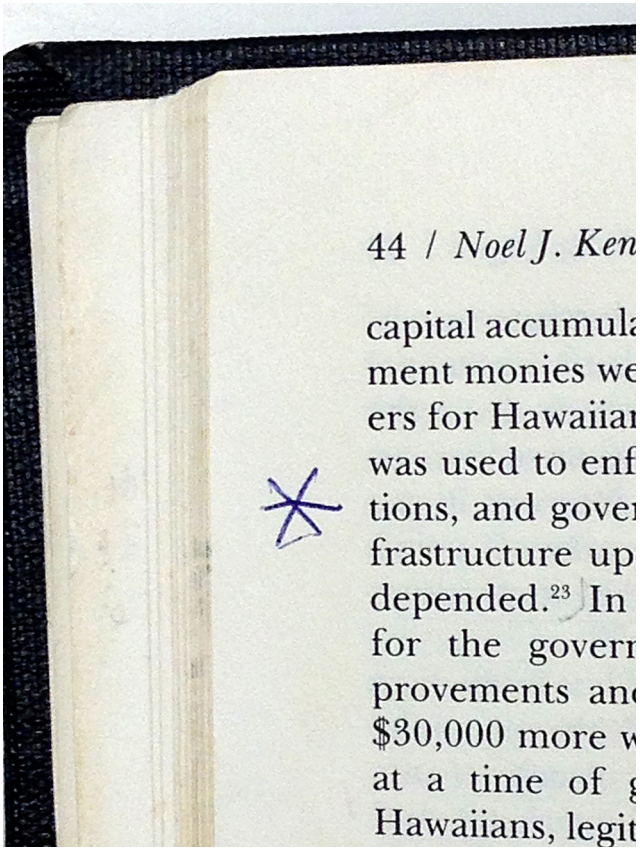

Fig. 1. A ball point pen inscription found on a UH library book page.

When a paper conservator tries to remove pen ink on a suction disk with the paper 'face-up', most of the ink will generally come out, but often a side effect of this is the appearance of some of the ink onto the verso of the page.

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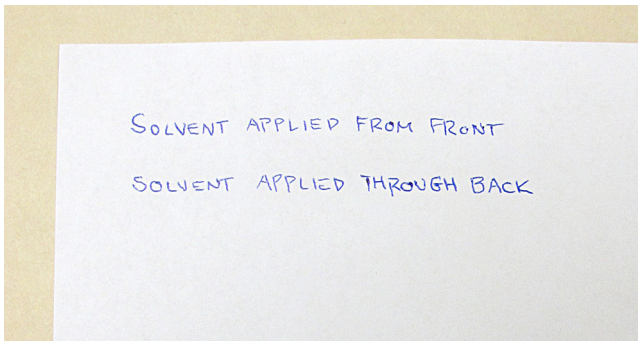


Fig. 2. Recto of paper, with ball point pen ink test, before treatment on a suction platen with ethanol.

Fig. 3. Recto of paper, with ball point pen ink test, after treatment on a suction platen with ethanol.

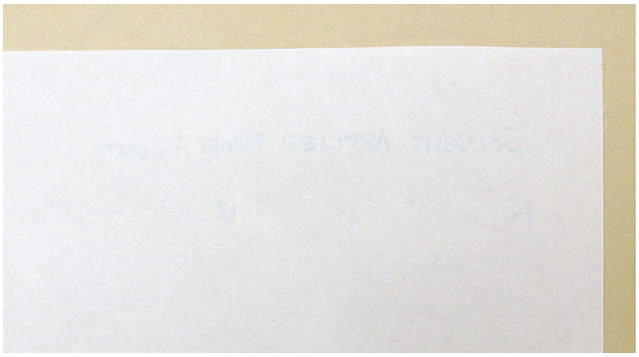


Fig. 4. Verso of paper, with ball point pen ink test, after treatment on a suction platen with ethanol.

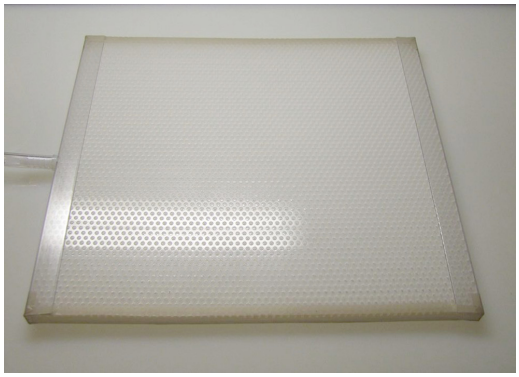
A quick test of this can be visible in figures 2-4 that shows different in results of applying the solvent from each side of the sheet. When a paper conservator tries to remove the pen ink on a suction disk 'face-down', attempting to prevent the ink from appearing on the verso, the conservator is often working 'blind' and cannot see where to apply solvent. This can present a problem when accuracy is needed due to the solubility of other nearby media. In a perfect world, many conservators might prefer to work 'face-down', as it reduces the risk of having inks show up on a nice clean verso, and it allows for a more direct pathway for the ink to flow into the blotter, but the drawback to working 'blind' often makes this approach undesirable.

What if there were a way to allow the conservator to both work 'face-down', as well as see through the sheet at the same time, so working 'blind' was no longer an impediment? What if there was such a thing as doing transmitted light suction table work? If one could merge the functionality of a suction disk with the benefits of transmitted light from a light table, then a conservator would no longer have to work 'blind'. In addition, this could be beneficial to other routine bench top techniques; such as judging the density of pulp-fills, and being able to align, hold, and mend double sided material. This paper will illustrate how to easily and cheaply make a transparent suction disk that can be used on any light table (figs. 5-6).

MATERIALS REQUIRED

1) *12" x 12" perforated polypropylene sheet with 1/8" holes*
The thickness of the sheet should be 1/8" or 0.125", and it should have 1/8" holes staggered on a 7/32" of an inch center to center. The color of the sheet should be opaque white. The size of the sheet purchased will be based on the size of the desired platen, but a 12" x 12" sheet was purchased for constructing the platen in this paper. A 12" x 12" sheet can also be purchased on Amazon® for approximately $15.00 before shipping. (fig. 7)

2) *24" x 48" 10mm three wall corrugated polycarbonate panel*
This is a material that is generally used in greenhouses. It is available in sheets up to 4ft x 8ft and also available in various



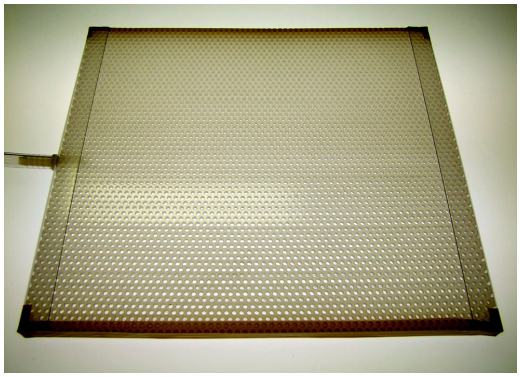


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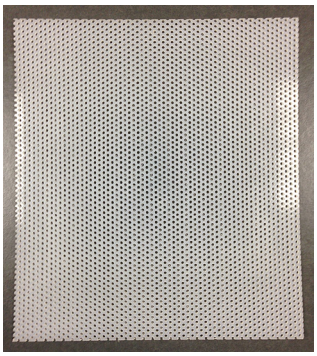
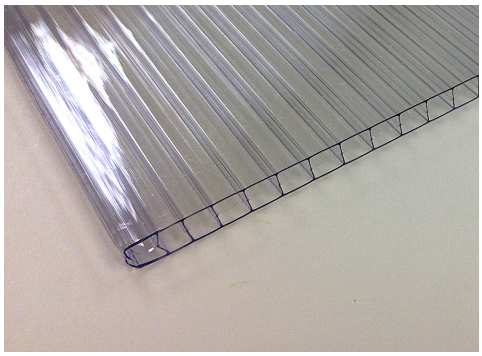
Fig. 5. Transparent suction platen on a light table with light off.

Fig. 6. Transparent suction platen on a light table with light on.





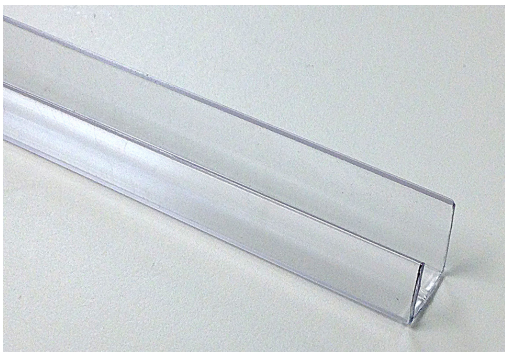


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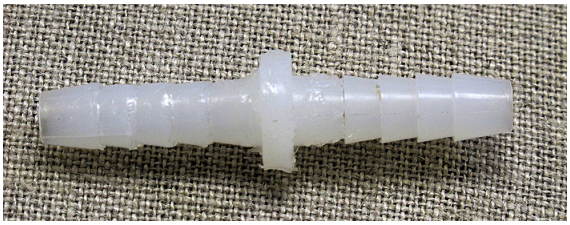
Fig. 7. Perforated polypropylene sheet.

Fig. 8. Corrugated polycarbonate sheet.

Fig. 9. Polycarbonate end cap.



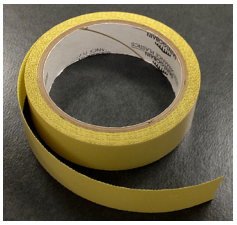


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Fig. 10. ¼" Teflon hose barb fitting (sometime called a hose mender).

Fig. 11. Loctite® brand clear silicon.

Fig. 12. Teflon tape.

thicknesses. There are many companies that sell it, but only a few that will sell smaller cut sheets, eliminating the need to purchase and ship a large sheet. For this project the corrugated polycarbonate panel was purchased from Charley's Greenhouse and Gardens®. In order to give enough room inside the sheet for the vacuum inlet, the 10mm three wall panel should be used. A 24" x 48" sheet will be the smallest available size that can be purchased, and it will cost approximately $25.00 before shipping. Upon request the company has been willing to cut this sheet in half to cut down the shipping cost. (fig. 8)

3) *48" polycarbonate end cap*
This is a U-Shaped plastic strip that is used to close off the open ends of the polycarbonate panel. This can also be purchased from Charley's Greenhouse and Gardens. A 48" strip will cost $3.50 before shipping. (fig. 9)

4) *polypropylene ¼" x ¼" hose barb fitting (sometimes called a hose mender)*
This is the piece that will allow a vinyl hose to connect the platen to a vacuum. It is available at most hardware stores for a few dollars. (fig. 10)

5) *clear silicon*
This will be used to create the seal around the hose barb. It is available at most hardware stores. (fig. 11)

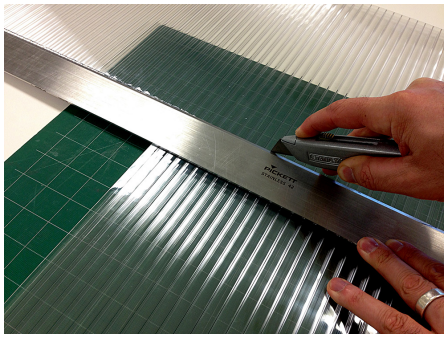
6) *Teflon tape*
This will be used to seal the edges and bottom of the platen. Rolls are available through Museum Services Corporation®. An 18 yard roll will cost $48.00 but will accommodate the construction of many platens. It also has many other uses so it probably won't go to waste in a lab. (fig. 12)

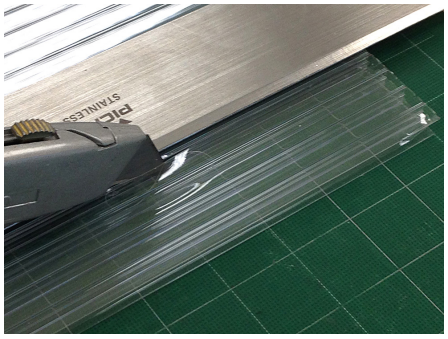
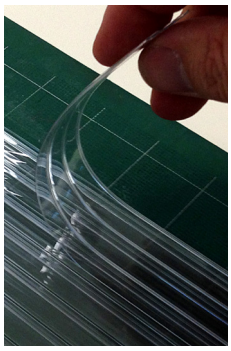
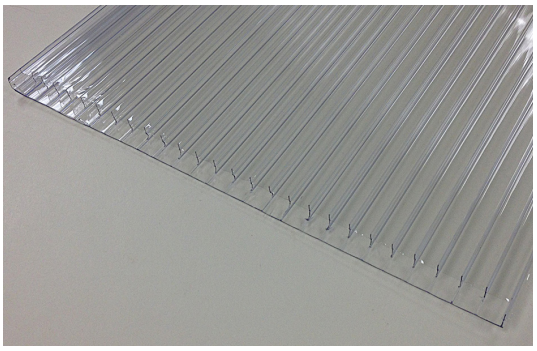
STEP FOR CONSTRUCTION

STEP 1. PREPARING THE CORRUGATED POLYCARBONATE

Using a utility knife and a heavy cutting ruler, cut the corrugated polycarbonate to the same size as the sheet of perforated polypropylene. When making the cut in the same direction as the channels, cut the polycarbonate so that the side of the sheet is also the wall of one of the channels. (fig. 13)

Using a utility knife with breakable blades, extend the blade of the knife all the way out, and carefully cut off the top layer of the corrugated polycarbonate to reveal the channels. The best way to do this is by cutting into the sheet two or three channels at a time, scoring the top layer with the knife



LEFT TO RIGHT, TOP ROW THEN BOTTOM

Fig. 13. Cutting the corrugated polycarbonate sheet to the same size as the perforated polypropylene.

Fig. 14. Cutting the top later off of the corrugated polycarbonate sheet to reveal the channels.

Fig. 15. Scoring the top layer of the corrugated polycarbonate sheet down the length of a channel.

Fig. 16. Peeling off a section of the corrugated polycarbonate sheet that has been previously scored.

Fig. 17. Cutting out of a ¼" notch off each and of the corrugated polycarbonates sheet to allow for air flow.

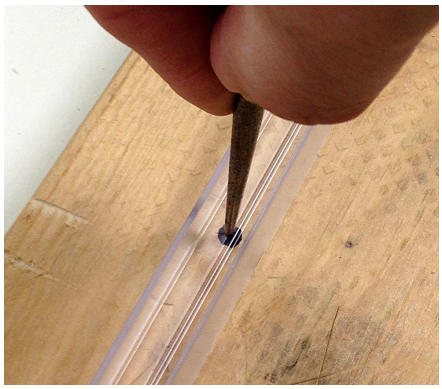
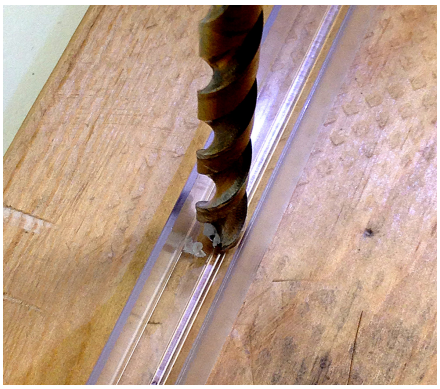




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Fig. 18. Marking the hole in the polycarbonate end-cap before drilling.

Fig. 19. Drilling out the hole in the polycarbonate end-cap, for the hose barb, with a 5/16" drill bit.

Fig. 20. Inserting the hose barb into the hole with silicon applied to create a seal.

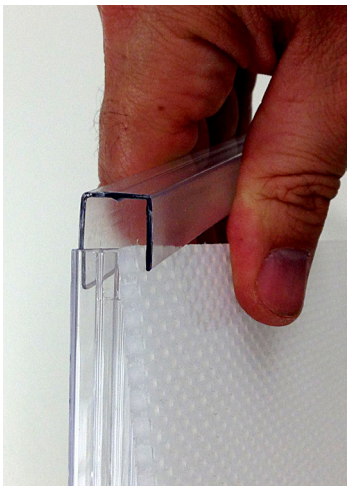
down the middle of one of the channels, and then peeling the top layer off. (figs. 14-16)

Using the utility knife carefully notch out approximately ¼" of the end of the channels on each side of the sheet, taking care to not cut the outer wall of the channels at the ends of the sheet. These notches will allow air to flow around the channels when the platen is sealed up. (fig. 17)

STEP 2. PREPARING THE END CAPS

Using a utility knife, cut the polycarbonate end caps so they are the same length as the open channel sides of the corrugated polycarbonate sheet.

Make a hole in one of the end caps for the hose barb fitting that aligns with one of the channels. This can be done by first putting one of the end caps on the corrugated polycarbonate sheet, marking the spot for the hole with a marker, creating an impression in the plastic with an awl, and finally drilling the hole with a 5/16" drill bit. Once the hole is drilled, install the hose fitting on the end cap by first squeezing some silicon under the flat spot of the hose fitting and then inserting it into the hole. If necessary, additional silicon can be added to the other side of the hole for additional sealing. (figs. 18-20)



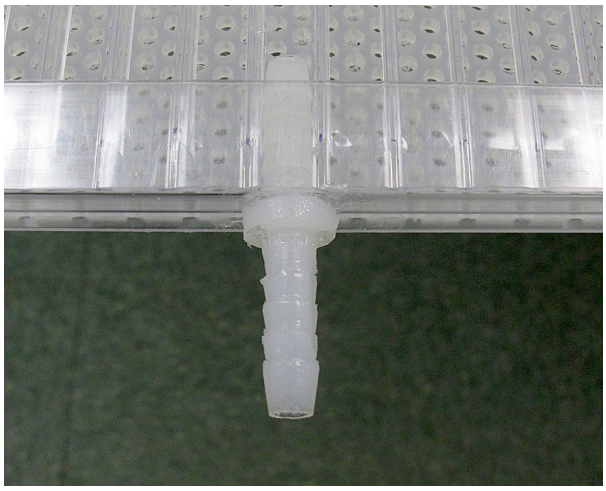


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Fig. 21. Applying the polycarbonate end-caps to the open channel sides.

Fig. 22. Close up view of hose barb fitting with the end cap inserted between the channels of the corrugated polycarbonate.

STEP 3. ASSEMBLING THE PIECES AND SEALING UP THE PLATEN

Place the rough side of the perforated polypropylene sheet against the open channel side of the corrugated polycarbonate sheet, and slide the end caps onto the ends where the open channels are visible, taking care to make sure the end cap with the hose barb slides comfortably into a channel. The larger side of the end-cap should be on the bottom, in order to allow for more suction area on the perforated surface. (figs. 21 and 22)

Using the Teflon tape, seal the sides that do not have the end-caps, taking care to wrap the tape around the corners. Seal the bottom of the platen by running a strip of Teflon tape over both of the end cap on the bottom. (figs. 23 and 24)

Fig. 23. Teflon tape is used to seal the two non-endcap sides of the platen.

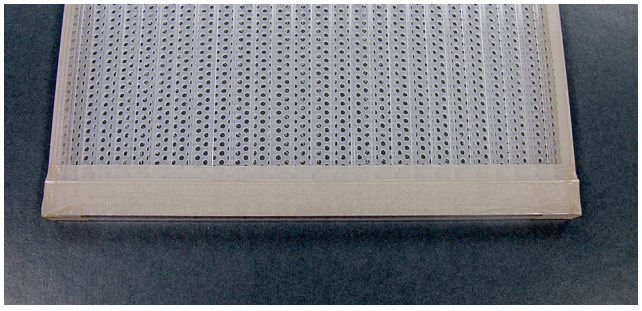

Fig. 24. A strip of Teflon tape is run across the two end caps on the bottom of the platen to create a seal.

STEP 4. ENJOY YOUR BRAND NEW TRANSPARENT SUCTION PLATEN!

A 3/8" clear vinyl hose can be attached onto the hose barb that can then be easily attached to a vacuum system. Figures 25 and 26 show what a completed suction platen should look like when done.

OBSERVATIONS

REMOVING BALL POINT PEN INK

The design of this device was primarily for this purpose. The platen will allow the conservator to have the paper face-down against the suction surface and apply solvent through the verso, while simultaneously being able to see the ink through the paper. This should prevent the ink from migrating to the verso of the sheet and allow accurate application of solvents. Due to the slight lip formed by the end caps on the perforated surface of the platen, masking off areas of the platen to create a smaller suction area will work better with the use of clear polypropylene rather than with polyester film. In order to allow for better light transmission during treatment either Tek-Wip or #2 Whatman® filter paper can be substituted for blotter paper.

CONDUCTING PULP FILLS

The platen can be very helpful for conservators that prefer to conduct their pulp fills on a suction disk or table. The clear suction platen will allow for the conservator to be able to judge the density of the fill, as it is happening, in relation to the density of the primary paper. When the pulpy water is

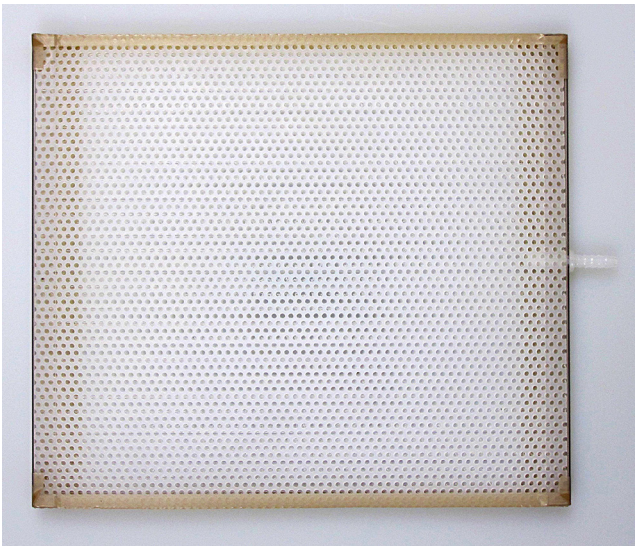

Fig. 25. Top of clear suction platen after completion.

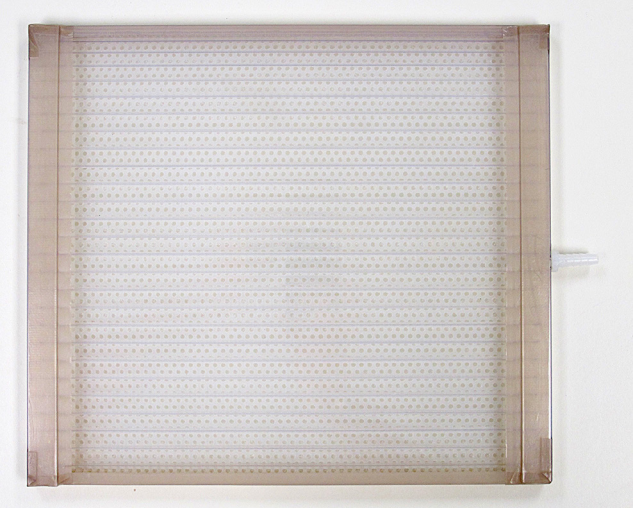

Fig. 26. Bottom of clear suction platen after completion.

applied to the area of loss the excess water will get pulled into the paper underneath. Due to the transmitted light properties of the suction disk and the ability to see through all of the layers at the same time, it can be difficult to determine, while conducting the pulp fill, whether the water is still in the fill itself or the paper underneath. Therefore, during the process of applying the pulp it can be helpful to frequently move the area being filled to a dry spot on the paper underneath.

ALIGNING AND REPAIR TEARS

As the clear suction platen will allow the conservator to see both sides of a sheet simultaneously, it can be very useful for aligning two area of a tear were the sheet might have media on both sides. It will also allow a conservator to accurately align a tear as if one were seeing it on a light table, and reinforce the verso of a sheet with tissue, all while the suction platen holds the sheet in place with the vacuum. In addition, due to the strong downward vacuum of the platen, repair tissue placed on the verso during the repair will often not require addition weights while the tissue dries, and it will also dry the repair out much faster as the airflow from the vacuum flows through the tissue.

STAIN REDUCTION

For certain types of stains having the ability to 'see' through the sheet during stain reduction can be very beneficial. It should be noted that while the perforated polypropylene has excellent resistance to many solvents, the corrugate polycarbonate underneath it does not. Certain solvents, such as acetone, will react and degrade the polycarbonate and eventually crack it. Before using the platen with a solvent it is strongly recommended that a drop of the solvent be applied to a scrap piece of the polycarbonate to observe the reaction.

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