EMILY RAINWATER
MODERATOR

Book and Paper Group Tips Session 2014: Contemporary Treatment—Tips and Techniques

MARJAN ANVARI

APPLYING NEW TECHNIQUES ON A TRADITIONAL ADHESIVE FOR BOOK CONSERVATION

Marjan Anvari, Book and Paper Conservator, Portland, Oregon, rastaakenterprises@gmail.com

Green Paste is a polysaccharide which dissolves readily in water thus making it ideal for paper and book binding conservation projects; it remains flexible, strong, stable, non-shrinking, and shows good aging characteristics and reversibility. These unique characteristics have been recognized by traditional paper conservators and bookbinders for many decades.

In fact, a version of this traditional adhesive has been used for hundreds of years in the making of Middle Eastern manuscripts. In the 20th century it was a primary adhesive used for making hand crafts and woodcrafts and is a trusted time honored material. The main advantage of this adhesive in addition to all its other good qualities, is the ease of use that does not require additional processing—it can be used right out of the jar cold. Just by simply adding some distilled water to the powder you can prepare the desired concentration of glue.

We have done in depth chemical analysis of the glue and its constituent components and can provide supporting documentation and compositional analysis if required. In addition extensive field tests have been performed and we feel confident you will find this adhesive an important new element for your conservation practice.

Please try our complimentary sample and let us know if you find it a useful addition to your workshop: rastaakenterprises.com, rastaakenterprises@gmail.com.

BETH DOYLE

ALT TRAINING

The staff in the Conservation Services Department at Duke University Libraries provides care and handling training for new library staff and student assistants. Our goals for this training are to communicate what we do, demonstrate how to handle books safely, and teach attendees how to identify materials that should come to Conservation.

In the past we have hosted individual training sessions as well as Care and Handling Week where we offer 8–10 sessions at a variety of times and locations on campus. To catch people we miss at these sessions we distribute our handouts and presentations via our intranet, but people seem hesitant to use our system to download the handouts. We also regularly get requests for a more flexible learning method than in-person sessions.

In order to reach more people, to make the training more fun, and to make the training schedule more flexible, we are experimenting with using social media tools to make quick training videos. We have used Instagram for short 15-second videos <http://instagram.com/p/juFiE6gw3q/>. Instagram is most popular amongst students and is a good place to reach them. YouTube allows you to post longer videos. We use it to create 2–3 minute training videos that incorporate more information and could stand alone as training modules. <http://youtu.be/LB0HhdSy808>.

Creating the videos takes little time and we have no video-production expertise. We've been able to repurpose many images that we already have, and we have also learned to embrace the concept of "good enough." You don't need professional equipment to make a short video tutorial. You need a smart phone for short Instagram videos, and if you are making longer videos you might need iMovie or another movie editor. "Just Do It" and "Keep It Short" are my mantras.

This informal tips session took place on May 30, 2014, during the 42nd AIC Annual Meeting in San Francisco, California. The moderator, Book and Paper Group Program Chair Emily Rainwater, selected and organized the tip contributors after placing an open call for volunteers from among the BPG and AIC membership. Readers are reminded that the Book and Paper Group does not necessarily endorse the methods or materials shared by tip contributors. Further evaluation or research is advised before putting treatment observations into practice.

We have covered topics including identifying damaged books, basic care and handling, how to remove a book from the shelf, how to shelve large books, and how to pack a book truck. Links to our videos can be found online. <http://tinyurl.com/doyleAIC2014>

Beth Doyle, Head of Conservation Services Dept. and the Leona B. Carpenter Senior Conservator, Duke University Libraries, b.doyle@duke.edu

GWENANNE EDWARDS
TEK-WIPE IN CONSERVATION

Tek-Wipe, a nonwoven, hydroentangled fabric composed of 55% cellulose and 45% polyester, is an inexpensive and sustainable alternative to cotton blotter. The fabric is currently available in heavy and light weights (122–126 g/m^2 and 64–69 g/m^2, respectively). Tek-Wipe is highly absorbent and strong when wet, unlike blotter, which has no wet strength. Tek-Wipe is also reusable: It can simply be rinsed with deionized water or rinsed, with no detergent, in a washing machine. This releases the discoloration and soluble degradation products that may be transferred from an object to the fabric. Tek-Wipe is also more dimensionally stable than blotter and does not distort when wet. The amount of moisture is easily controllable to match the needs of a given object. Tek-Wipe can be misted with water or wrung or brushed to remove excess moisture. Tek-Wipe is also significantly less expensive than blotter.

The most common use of Tek-Wipe is for capillary washing, so that instead of changing and discarding discolored blotter throughout the washing process, conservators can simply rinse and reuse the fabric. This is especially useful for objects with a large amount of discoloration, as there is less waste, and objects with sensitive media, as only slightly dampened Tek-Wipe will still pull a significant amount of discoloration from the support. For especially fragile and sensitive objects, stacking sheets of Tek-Wipe increases the capillary action and decreases the frequency of rinsing, thereby reducing handling of the object. It is also possible to capillary wash large objects, such as wall maps, by using a few long, overlapped strips of Tek-Wipe.

Tek-Wipe is also used instead of thin blotter as a support for washing objects on the suction table. Because it swells less, Tek-Wipe allows for greater suction than blotter. Tek-Wipe can also be used instead of Paraprint OL 60, a nonwoven fabric of viscose fibers in an acrylic binder, for slant washing. Paraprint wets unevenly upon reuse, while Tek-Wipe, which has no binder, does not.

Due to its absorbent properties, Tek-Wipe can also be used to dry and flatten paper objects. Bill Minter (2002) introduced the idea of using Tek-Wipe to dry wet books, using a modified interleaving system. In a similar vein, Tek-Wipe can be used as interleaving for water-damaged books in emergency-response scenarios.

Because it has a smooth surface and is chemically stable, Tek-Wipe can also be used for surface cleaning glass plate negatives, whereas cotton often leaves small fibers behind. Tek-wipe can also be used for dry cleaning some paper objects, humidification like Gore-tex, and calcium bicarbonate and phytate treatments.

REFERENCES

Minter, B. 2002. Water damaged books: washing intact and air drying—a novel (?) approach. *Book and Paper Group Annual* 21: 105–109.

SUPPLIERS

Heavyweight Tek-Wipe
36 in. wide, by the yard or 100-yard roll
Polistini Conservation Material LLC
www.polistini.com
conservation@polistini.com

Lightweight and Heavyweight Tek-Wipe
36 in. wide, by the 100-yard roll
William Minter Bookbinding & Conservation, Inc.
wminter@pennswoods.net

Texwipe Techincloth® (lightweight)
Packs of 4–12 in. square cloths
www.texwipe.com

Gwenanne Edwards, Andrew W. Mellon Fellow in Paper Conservation, Conservation Center for Art and Historic Artifacts, Philadelphia, PA, gedwards@ccaha.org

BETSY PALMER ELDRIDGE
BEADING: A JAPANESE TECHNIQUE USED TO RELAX LAMINATED PAPERS

The Japanese paper conservation tradition is full of wonderful techniques that are useful in western book and paper conservation as well. One of my favorites that seems to be little known in the West is "back beading" laminated papers to make them more flexible. In Japanese it is called Urazuri. It is described in the Glossary of the 2004 International Course on Conservation of Japanese Paper as "Rubbing Beads: A string of glass beads or soapberry seeds (mukuroji) used to soften and smooth a scroll by rolling the beads over the back of the final backing (soura) after it has been stretch dried, before the reverse drying. Also known as juzu."

The proper string of beads is about 105 glass beads, roughly ¼ of an inch in diameter, loosely strung together into a strand approximately 38 inches long, tied together to form a necklace of 19 inches. The necklace is first coiled

on a flat surface and placed flat under the palm of the hand. Then the coil is rubbed across the surface, either in a circular motion or back and forth, with considerable pressure. The beading does not delaminate the sheets but softens the adhesive so that the sheets lose their stiffness and lie flat, losing any warping or cockling. Any burnishing can be avoided by using a protection sheet.

This simple but remarkably effective technique can be used to soften any lamination. In paper conservation where lining items is a common practice it is particularly useful. In bookbinding it provides a convenient solution to the stiffness in the flyleaves of "made endpapers" that often has been found to be objectionable. It also lessens the stiffness in other sheets lined during restoration such as the title page and frontispiece. With a little imagination, the principle can be adapted and applied elsewhere… And if glass beads are not available, Mardi Gras beads seem to work very well in a pinch! Enjoy!

Betsy Palmer Eldridge, Book and Paper Conservator in Private Practice, Toronto, Ontario, bpeldridge@aol.com

ANNE MARIGZA
USING RARE EARTH MAGNETS IN A SOLVENT CHAMBER

Fig. 1. Rare earth magnet with large petri dish.

Fig. 2. Rare earth magnet with Pyrex dish.

A pair of rare earth magnets can be used to secure a solvent-saturated blotter to the ceiling of a glass solvent chamber. One goes on the inside and the other goes on the outside. You can use a glass dish in the size and shape most appropriate to your project.

Additional notes:

- The magnets work just as well with disposable Mylar trays.
- Inspect your magnets before use. Discard magnets that are powdery or have flaking coating.

Anne Marigza, Conservator, US Holocaust Memorial Museum, Washington DC, amarigza@ushmm.org

TERRY MARSH
CLING AND RELEASE: SILICONE MYLAR + JAPANESE PAPER + WHEAT STARCH PASTE = A ONE-STEP HINGE FOR FLOAT FRAMING

Here are directions for delicate, translucent hinges to be used for attaching translucent or opaque paper items to back mats for float framing. The gossamer Japanese paper (Tengujo-thin) chosen for the hinges clings to the silicone coated polyester (Mylar) when the wheat starch paste is applied. The silicone coated polyester supports the wet hinge with the fibers in position. This method attaches the hinge to the art and back mat all at one time. This method can also be used for any weight or size hinge. The item being attached remains face up, positioned on the back mat.

1. Prepare silicone coated polyester strips. A suggested size is 1 1/4 by 6 inches for 2 by 1/2 inch hinges.

For interior hinges: shape the silicone coated polyester strip using scissors, curving the cut to create a tail so the strip can be pulled out using tweezers after drying. Cut along long side about 1/2 inch from the edge for about 3 1/2 inches, then curve up to cut off this section. The balance of the strip can be trimmed but leave enough of the full size section to hold while manipulating.

2. Shape the hinges, possibly wet torn on the long sides, and scissor cut on the short vertical sides. Fold the hinge to make a sharp crease.
3. Position the item to be hinged on the back mat and place a blotter and weight.
4. Place a hinge on a scrap of mat board, place a strip of silicone coated polyester on top covering 1/2 (horizontal orientation). Fold over the hinge so the crease is snug to the edge of the strip. Use the shaped strips for the center hinges so they can be easily removed.

5. Coat the exposed half of the hinge with wheat starch paste. The hinge will cling to the silicone coated polyester strip. Turn over the hinge onto a second strip and coat the other side. Blot very lightly.
6. Lift the hinge/silicone coated polyester and position between the item and the back mat. Immediately press three times with blotter. Then place blotter and weight.

Continue with all the hinges. Let dry overnight, or 20 hours.

7. Position weight on the item about 4 inches below hinge. Remove blotter and weight from hinge. Gently remove the silicone coated polyester strip by pulling with tweezers and your hand. Wiggle to help detach if necessary.

Note that the silicone coated polyester is also very handy as a carrier when mending tears using Tengujo-thin as the fibers will stay in position because they are clinging to the carrier.

SUPPLIER
Talas
330 Morgan Ave, Brooklyn NY 11211
212 219-0770
www.talasonline.com

- Silicone Coated Polyester (Mylar), coating on two sides, .0015 inch gauge Item #TFM004004
- Tengujo (Thin) Item #TPB092001

Terry Marsh, Terry Marsh Art Conservation, Damariscotta, ME, tmarac@tidewater.net

BILL MINTER
REVERSE-ROLLING OF ARCHITECTURAL DRAWINGS

Rolled architectural drawings are always difficult to handle. When some of these drawings were sent to our department for digitization, they had to be flattened in some manner (fig. 1). Since the paper was in good condition and not brittle, humidification did not seem necessary. An efficient method of treatment was prepared based on an early account bookbinder's technique: To create the rounded spines for ledger books, account binders would use a mailing tube with a length of paper attached; then a piece of thin board was covered with glued paper, and the assembly was then rolled up inside the paper extension. This same technique is ideal for reverse-rolling of paper in good condition.

A small diameter mailing tube of about 1–1/2" to 2" is used, along with a length of paper that is secured to the tube with double-sided tape. Since this treatment is very short-term, 36" wide Kraft paper about 6-feet long was used. When ready, the tube is positioned near the edge of a workbench with the

Fig. 1. Architectural drawings to be flattened for digitization.

Fig. 2. Leading edge of drawing aligned to the nip of a mailing tube; note the support paper extends to the floor.

Kraft paper extending to the floor. The leading edge of the rolled drawing is inserted into the nip of the mailing tube and support paper (fig. 2). While the mailing tube is being rolled, the drawing is unrolled (fig. 3). When completed, the roll can be secured with tape or Quick-ties. The reverse-rolled

Fig. 3. Unrolling the drawing while rolling up the support paper around the tube.

drawing should remain in this manner overnight. Most of the drawings were ready for digitization after that time; in some cases, a second day may be needed and/or a smaller diameter tube can be used. Reverse-rolling in this manner seems ideal for most drawings. Care and other treatment options should be considered if the paper is delicate and/or brittle.

BILL MINTER
ALTERNATIVE TECHNIQUE FOR SPRAYING WATERCOLORS AND PAINTS

When a specially colored or toned paper is needed, we sometimes brush on a color or dip the paper. An alternative is an air-brush, if one is available. Another option is the PREVAL Sprayer Products system. This system uses a small compressed gas cylinder that is attached to a bottle with your paint or color. A 6 oz. glass jar is supplied, or 3 oz. plastic jars are available, and these jars can be sealed for use at a later time

Fig. 4. Preval Sprayer Product systems.

(fig. 4). Any color can be mixed and used in the sprayer just like a regular can of spray paint. For a special project, I used dilute watercolor, sprayed in a horizontal and then a vertical pattern for uniform coverage. Further comment: For a very large, special project, an automotive, gravity-fed, paint sprayer was used. With either sprayer, the end results were very satisfying and met the requirements of the project.

Suppliers: Preval Sprayer Products are available from auto body refinishing suppliers, some hardware stores, Home-Depot and Lowes home improvement stores.

BILL MINTER
VELCRO-CLOSURES FOR PHASE BOXES

Velcro is commonly used to secure phase-boxes and portfolios. Unfortunately, standard Velcro is very aggressive and this can be too strong for some boxes. In some cases, the extra strength has a tendency to delaminate the board. Our commercial binder for Penn State had used the standard Velcro for some boxes. We sought an alternative and upon contacting the manufacturer we learned of a so-called, "Clear-Transparent" Velcro. This product is much more suitable for use in our library collection. In addition to the lower strength, this alternative has a reduced bulk, which is an added advantage (fig. 5).

Suppliers: While there must be other suppliers, we were directed to Home Depot for our first supply of the Clear-Transparent Velcro.

Fig. 5. Standard Velcro at top with "Clear-Transparent" (reduced-strength) Velcro.

BILL MINTER

DRY-TEARING OF PAPER FOR INFILLS

This is a simple idea that may have eluded us for many years: the use of a piece of woven stainless-steel mesh seems to offer an ideal surface when tracing the outline for an infill to a document. To use, the mesh screen is positioned on a work surface with a sheet of mending paper, either Western or Japanese, on top (fig. 6). The document needing the infill is then positioned. By using an awl or suitable stylus, one can trace the shape of the infill. Since the awl tends to mark the paper because of the mesh, it perforates the paper so that it is easily torn along that line. Depending on the type of paper and the size of the mesh, the resulting perforation will vary to create a neat, dry-tear that is ideal for most infills (fig. 7).

The woven mesh screen is typically identified by the size of the wire and number of wires per inch, such as .010" wire and 40 x 40. That size might be considered a medium screen,

Fig. 6. Tracing an infill on a suitable paper for a perforated line.

Fig. 7. Dry-tearing of perforated paper.

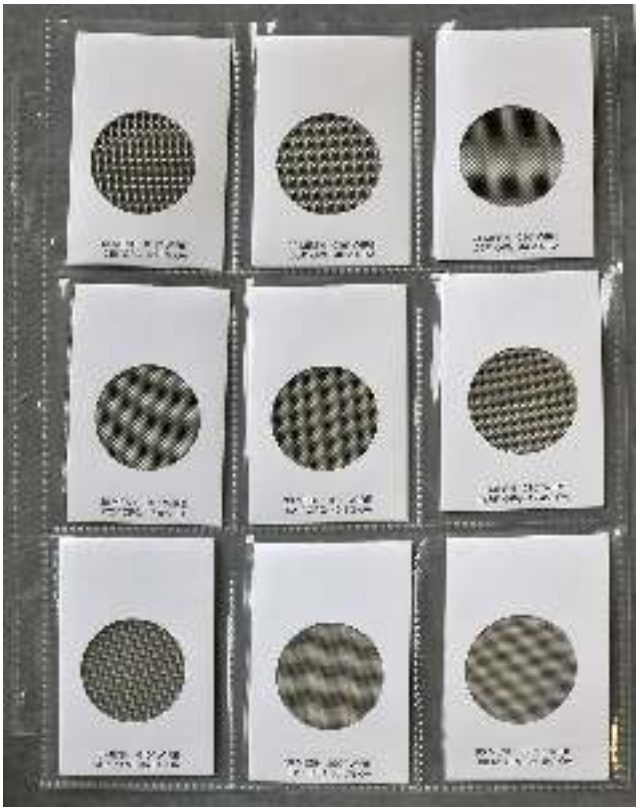

Fig. 8. Samples of various sizes of woven wire mesh.

while a coarse screen might be 20 x 20 and a fine screen is 90 x 90. For testing purposes, McMaster-Carr Industrial Supply offers a set of sample mesh screens in a range from 18 x 18 to 70 x 70 (fig. 8); other finer mesh screens are also available. After determining the best for your purposes, the screen can be ordered in any size from one square foot to almost any size.

Supplier: Sample pieces, catalog # 9231T16 from McMaster-Carr at www.mcmaster.com; larger woven sheets are also available.

Bill Minter, Book Conservator, Penn State University, University Park, PA, wdm14@psu.edu

LAURA NEUFELD

REVIEW OF FLATTENING TECHNIQUES FOR THIN OR TRANSPARENT PAPERS

Thin or transparent papers can be difficult to flatten because they often have distinctive surface characteristics, can be fragile due to embrittlement, or be prone to extreme cockling and uneven expansion when exposed to moisture. Humidification and flattening can alter the surface texture and sheen of thin or transparent papers. These features should be considered when selecting a flattening method. This tip is a brief review and endorsement of several useful techniques that have been previously published.

Mylar flattening (fig. 1) was described by Catherine Nicholson (1988) and is useful for imparting a slight sheen to the paper as one side dries against the surface of a Mylar or Teflon sheet. The object must be fully wet to achieve the best results, which may not be possible for all works.

The hard-soft sandwich (fig. 2) was developed by Hildegard Homburger and Barbara Korbel (1999) for architectural drawings but can be used for any thin paper. The technique only requires light humidification, which minimizes dimensional changes in the sheet. Severe creases are removed without significantly altering the surface texture. For severely distorted papers multiple layers of fleece are used. White capillary matting or Gore-tex can be substituted for polypropylene fleece. The success of this method requires significant weight on the stack.

Friction flattening (fig. 3) was developed by Keiko Mizushima Keyes (1984). In this variation the humidified object is sandwiched between damp sheets of a dimensionally stable medium-weight Japanese tissue. Smooth the layers with a brush (*nadebake*) to ensure good contact. Damper Japanese tissue will result in stronger flattening since the sheets restrict the object as it dries. Because friction flattening imparts some texture from the Japanese tissue to the object it is not recommended for highly calendared papers.

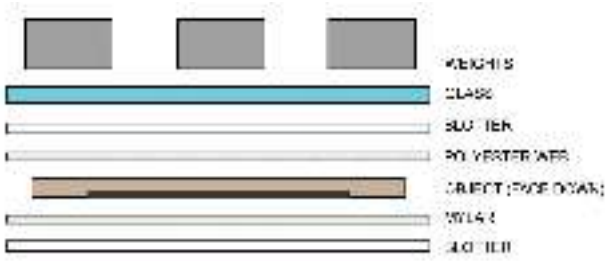

Fig. 1. Diagram of Mylar flattening.

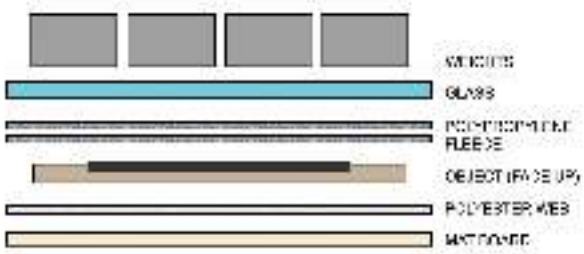

Fig. 2. Diagram of the hard-soft sandwich.

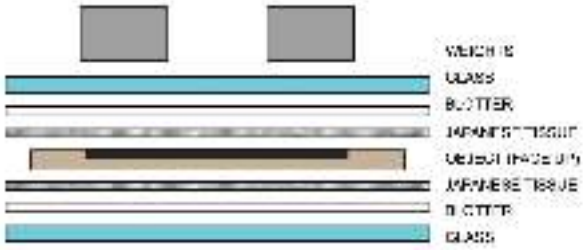

Fig. 3. Diagram of friction flattening.

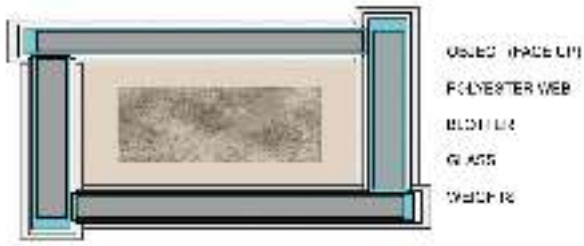

Fig. 4. Diagram of edge/stretch flattening.

Edge or stretch flattening (fig. 4) is useful for works with fragile media that can't withstand weight on the surface. The object must be very damp in order to pull the sheet into plane as it dries. Because edge restraint creates tension in the sheet, it should not be used on brittle papers. This technique can also result in greater dimensional change.

REFERENCES

Homburger, H and B. Korbel. 1999. Architectural Drawings on Transparent Paper: Modifications of Conservation

Treatments. *Book and Paper Group Annual*, 18. http://cool.conservation-us.org/coolaic/sg/bpg/annual/v18/bp18-06.html (accessed 03/15/13).

Keyes, K.M. 1984. The Use of Friction Mounting as an Aid to Pressing Works on Paper. *Book and Paper Group Anual*, 3. http://cool.conservation-us.org/coolaic/sg/bpg/annual/v03/bp03-10.html (accessed 3/15/13).

Nicholson, C. 1988. The Conservation of Three Whistler Prints on Japanese Paper. In The Conservation of Far Eastern Art, ed. H. Mabuchi and P. Smith. London: International Institute for Conservation of Historic and Artistic Works. 39–43.

Laura Neufeld, Assistant Paper Conservator, The Museum of Modern Art, New York, NY, laura_neufeld@moma.org

ADAM NOVAK
AQUAZOL AS A HEAT SET ADHESIVE ON PAPER

Based on research and publications by Katherine Lechuga, Aquazol can be used successfully as a heat set adhesive for mending applications that are usually complicated. In my applications, I have applied a solution of 5–6% Aquazol 500 in ethanol to two cross-grain sheets of 2 gram Tengucho (Hiromi). Application in ethanol allows for quick, lint-free drying; crossing grains of two sheets of thin paper allow for even expansion and adequate transparency.

I initially used this technique on vegetable parchment, a thick, slick, and transparent paper that had numerous tears around the edges and into the design layer of architectural drawings. I was able to align the tears and apply the prepared heat set tissue with the pressure and heat of a finger. Once the mend was in place, silicone release paper was placed above and below the vegetable parchment and the mend was further set with a tacking iron. The mends were slightly shiny on the applied side, but appeared completely transparent from the opposite (recto) side.

Katherine Beaty carried out another treatment with similar application techniques and a slight modification at the end. A book with iron gall ink borders was repaired by applying the heat set tissue, this time made with Berlin tissue, on both sides of the corroded-ink border. After tacking the tissue in place with heat, the gloss of the Aquazol film was reduced by going over it with a small stencil brush barely dampened with ethanol. The small amount of ethanol was enough to give a matte appearance to the adhesive and making the mend more invisible.

ADAM NOVAK
PH STRIPS VERSUS PH METERS

For conservation facilities that have water purification systems, this is a note about the accuracy of the traditional pH strips versus an electronic pH meter. My observation came out of general frustration of the pH strips changing quite slowly or not at all when placed in deionized water conditioned with calcium carbonate. Theoretically, this type of water should be basic; when measured with pH strips at various times during the day or throughout the week the results would be significantly different or inconclusive. Measuring with the electronic pH meter gave results that were higher in pH than the strips, resulting in general confusion about which measuring device was more accurate. (At the Weissman Preservation Center we use pH strips with various trade names manufactured by Merck, and a Horiba twin-pH meter.)

I then decided to also measure the conductivity of the water. Conductivity is the concentration of ionic activity within a solution, important in this instance because we use primarily deionized and calcium-conditioned water. I found that our water has very little ionization, which is to be expected from a purified water system, but even the calcium-conditioned deionized water measured in the low range of 10–40 μS/cm. As a comparison, I prepared two buffer solutions with known pH ranges and measured with pH strips and the electronic pH meter (table 1).

Note that in the table the measurements between the pH strip and the electronic pH meter are the same. The conductivity of the two buffer solutions is also considerably higher than the calcium-conditioned deionized water. This would indicate that a higher conductivity allows for a more accurate measurement with the pH strips.

Merck notes in a technical leaflet that the pH strips are less accurate and slower to read a weakly buffered solution,

Solution	pH strip	pH meter	Conductivity (µS/cm)
Deionized water	~	~	0
Calcified water	7.5-8	10.2	32
Phospate-Citrate Buffer in water	5	5	6000
Trizma Buffer in water	7.5-8	7.7	4100

Table 1

but they do not define weakly buffered. Measurements that seem more accurate at one point and less at another could be accounted for by the concentration of ionized material (calcium carbonate, calcium hydroxide, ammonium hydroxide) that has been added to the water. It is likely safe to assume that using highly purified water in conservation necessitates the use of more accurate measurement devices, such as the electronic pH meter.

Adam Novak, Paper Conservator for Special Collections, Harvard Library, Cambridge MA, adamrnovak@gmail.com

BECCA POLLAK
SPRAYED CELLULOSE POWDER TO MINIMIZE LOCAL DISCOLORATION ON PAPER

The use of cellulose powder to cover stains or other disfiguring damage that may not otherwise be reduced has been common practice in paper conservation. Recently, methods have been developed by Elissa O'Loughlin with Stephanie Jewell at the Walters Art Museum for spray application of micro-cellulose powder directly onto a paper support, or onto Mylar for use as a remoistenable film[1] (fig. 1). These techniques have been used effectively to lessen the appearance of stains and foxing on paper and can also serve as a barrier layer for inpainting on moisture sensitive objects. Direct spray application—through Mylar stencils on paper, for in-situ treatments on wallpaper, or for camouflaging damage to canvas is an additional alternative to traditional inpainting or other overlay techniques.

To make the film, the cellulose powder is dispersed in methylcellulose to form a slurry. An external-mix paint sprayer is used (fig. 2) which can spray a more viscous solution with larger particles than standard (internal-mix) airbrushes. The sprayer is made for broad coverage and can be run on an airbrush compressor (fig. 3), canned propellant, or CO_2 tank (with fittings and regulator).

After complete drying, the finished film can be stored on the Mylar support and pieces separated as necessary using a micro-spatula. The cellulose films do require some front-loading efforts but can be a valuable addition to an inpainting tool kit. Please refer to the BPG wiki for a detailed procedure sheet and equipment resources.

RECIPES FOR THE CELLULOSE POWDER SLURRY

Recipe 1 (Elissa)

- 20mL water
- 0.5 tsp. Methocel® A15C (selected because of its low molecular weight)
- 5mL isopropanol (wetting agent)
- 1g cellulose powder[2]

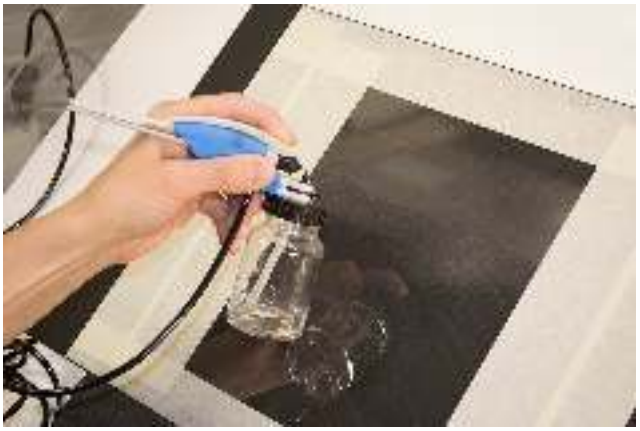

Fig. 1. Sheets made using Solka-Floc® purified powdered cellulose and Methocel® A4M. Gradations of brown can be made by cooking the dry white powder and mixed to achieve various tones of paper, board, and canvas.

Fig. 2. Spraying the cellulose powder slurry onto Mylar using Testors® Multi-Purpose sprayer #8814 (This model was recently replaced with Testors® Basic Broad Stroke Airbrush System #A2207).

Fig. 3. "Mini" air compressor (Testors® #50204A) with paint sprayer and hose attachment.

Recipe 2

- 20mL 1–2% Methocel® A4M (a lower concentration of the higher molecular weight methylcellulose yielded good results)
- 5–10mL isopropanol
- 1g cellulose powder

NOTES

1. O'Loughlin, E. and S. Jewell. 2013. Two new techniques for loss compensation in art on paper: Integration of surface losses using textile fibers and the use of sprayed cellulose powder to minimize foxing and other discoloration [Abstract]. *The Book and Paper Group Annual* 32:52
2. Spraying was most successful with Solka-Floc® 300 micro-cellulose powder (fiber length ~22 μ), available from International Fiber Corp. North Tonawanda, NY 14120. Tel: (888) 698-1936. http://www.ifcfiber.com

Becca Pollak, Graduate student, class of 2014, SUNY Buffalo State College, Buffalo, NY, beccapollak@gmail.com

CHER SCHNEIDER

QUICK AND EASY PLEXI PASTE

INTRODUCTION

The Rare Book and Manuscript Library (RBML) at the University of Illinois Urbana-Champaign campus (UIUC) participated in a traveling exhibition of 35 books traveling to Germany and the custom-made acrylic cradles were breaking at the joints. The RBML director approached Conservation to repair the broken cradles. Many of the commercially available Plexiglas® adhesives are proprietary with unknown chemical composition or contain a toxic ingredient, such as methylene chloride. Methylene chloride or dichloromethane is a volatile, colorless liquid with a chloroform-like odor that is labeled as a carcinogen by OSHA. Due to safety concerns and unknown off-gassing properties I developed this process to make a conservation-grade Plexiglas® paste that can be recreated in most equipped conservation laboratories.

PROCESS

Equipment Needed: goggles, nitrile gloves, fume hood, straight edge, Plexiglas® cutter, cutting board, polyethylene bag, glass beaker, glass stirring rod, Parafilm, cotton swabs, weights, microspatula, tweezers, pliers, eyedropper, acetone, and toluene.

Step 1: Collect Plexiglas® Shavings

- Choose a color of Plexiglas® that suits the item to be glued. *Clear Plexi works for all colors.*
- Cut Plexiglas® to make shavings. fig. 1
- Save shavings in a container (glass beaker or polyethylene self-sealing bag).

Fig. 1. Cut Plexi with Plexi cutter to make shavings to dissolve into paste.

Fig. 2. Acetone will partially dissolve Plexiglas and will be semi-transparent and milky-white in color.

Step 2: Dissolve Plexiglas® to Make Paste

- Crush Plexi shavings into smaller bits by stirring with glass rod in beaker.
- Mix in drops of acetone until Plexi shavings are mostly dissolved.
  - *The semi-dissolved Plexi will be slightly transparent and milky white in color* (fig. 2).
- Mix in drops of toluene until Plexi is fully dissolved and transparent (fig. 3).
  - Consistency is best in *gel form* or like *molten glass*.
  - Continue to add drops of acetone or toluene to keep in gel form. Cover with Parafilm "M" to extend gel stage.

Fig. 3. Adding toluene to the paste will fully dissolve the mixture and it will become transparent and clear. Do not over mix!

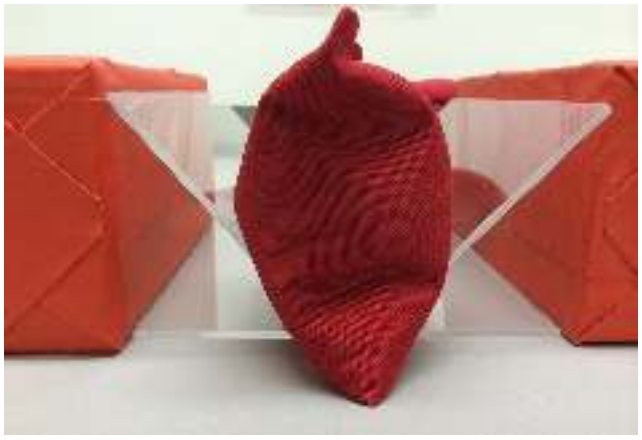

Fig. 4. After gluing out Plexi make sure to dry underweight in the fume hood.

Fig. 5. One of the custom RBML Plexiglas cradles glued with quick and easy Plexi paste. The cradles survived travel to Germany and home using this paste.

Step 3: Attach Plexiglas® Using Plexi Paste

- Add a strip or beads of Plexi paste with the glass stirring rod or eyedropper. *A little goes a long way*.
  - Use mat board or Plexi scraps to scrape away excess paste.
  - Clean up excess Plexi paste on edges with a cotton swab and toluene.

Step 4: Curing Process of Plexiglas® Paste

- Hold item in place with weights in fume hood until completely cured (fig. 4).
  - *All organic solvents dissipate in approximately* 15–*20 hours, overnight.*

Step 5: Clean Up

- After paste dries in beaker, the Plexiglas® paste removes easily.
  - *The dried Plexi Just pops out of beaker and off glass rod. (May need pliers)*

If the Plexi adhesive is left in the glass beaker then the Plexi paste can be reactivated with acetone and toluene. To reactivate, break up the dried paste into smaller pieces and begin at step 2 of the Plexi paste process.

CONCLUSION

There are pros and cons to the quick and easy Plexi paste, but overall the paste is found to be a superior solution to commercially available Plexiglas® adhesives for conservation purposes. The Plexi paste is cheap to produce as the scraps of Plexi can be used or your local Plexi retailer can supply the shavings, *although may not be pure in color*. The paste is also easy to make in an equipped conservation laboratory. This Plexi paste is quick drying and once dry—although not tested—only Plexiglas® remains forming the bond with limited to no off-gassing. This Plexi paste is also very strong and the Plexiglas® will often break before the bond. The few negatives about the paste are bubbles and cracking. While creating the paste, bubbles will form if the paste is over mixed but can be alleviated with letting paste stand for a while covered with Parafilm "M". *(Parafilm "M" can extend the gel-stage for up to three days.)* The Plexiglas® can develop cracks during the curing stage and *existing cracks will extend*. To conclude this Plexi paste is often used by UIUC Library conservators and has allowed more creativity with cradles with the use of different shapes and angles while holding books and special collection materials from libraries and archives safely and securely (fig. 5).

FURTHER INVESTIGATIONS

- What causes the cracking observed along joints to grow during curing?
- Methods to reduce and eliminate bubbles in Plexi paste.
- Can heat be used to reactivate or extend gel phase safely?

- Can organic solvents be eliminated by using heat such as Kistka pen?
- How many times can you reactivate paste?
- What is the best applications of paste?

Cher Schneider, Juanita J. and Robert E. Simpson Senior Conservator, University of Illinois at Urbana-Champaign Library, Champaign, IL, schnedr@illinois.edu

STEPHANIE WATKINS
STUDIO-LAB WEIGHT SOURCES

THINGS TO CONSIDER WHEN SEEKING WEIGHTS

Be creative, resourceful, and open-minded. The sources are limited to your imagination. Think "outside-the-box" at what might work for your needs. Seek variety: No one perfect weight, size, or shape exists for all applications across specialties. Compare prices as a wide range of cost in pricing per pound/kg exists. Making your own is the best value for the money. To be as green as possible, look locally, ask around for free items, re-use, and repurpose. Use local transport to reduce gasoline, oil, and carbon emissions. If you have to ship, consider USPS flat-rate priority boxes. The smallest size is under US$6 per box on-line for up to 70 lbs/31.75 kg (as of May 2014).

READY-TO-USE WEIGHT SOURCES

Distributors such as Conservation-by-Design, Gaylord, Hollinger Metal Edge, Talas, and University Products, sell ready-made weights from pillows to tailor's style weights. Hand-crafted weights include varieties from Elissa O'Loughlin's Wren Haven Tools and Inherent Vice Squad. Conservation specific weights are the most expensive options.

A variety of weights are used in many non-conservation endeavors and include magnets, sewing supplies (such as drapery or curtain, string or tape, pattern and tailor's weights), scuba and exercise weights (sold by the pound/kg), fishing weights, car-tire balancing weights, glass scraps, paperweights, flat irons, shoe anvils, door-stoppers, copy presses, rail-ties, counter-weight window sashes (pre-WWII USA houses, hexagonal ones roll less), torchiere lamp bases, laptop computer battery packs, calibration, postal, and balance weights, books, and construction supplies such as bricks and threshold molding.

New items can be bought from specialty and box stores, including hardware, fabric, upholstery, art and craft stores, sport, boating, scuba, and fishing stores, glass and auto shops, box stores, science and electronic equipment suppliers. Used items can be obtained for free or found at reduced prices in a plethora of resale markets including garage/yard/jumble sales, flea-markets, second-hand and antique shops, construction recyclers and industrial surplus centers, Habitat for Humanity resale stores, Craig's list local, Freecycle, Ebay, Etsy and Etsy vintage (look for local vendors then contact them via a "convo" email).

MATERIALS TO MAKE INTO WEIGHTS

Metals and stones can be adapted into weights suitable for conservation use. Metals include heavy metal scraps including scrap metal, steel bar, bb shot (graphite coated lead to minimize corrosion is one type), used scalpel shards, nails, washers, mending plates, ball bearings, and coins. Metal materials are available from hardware stores, recycling (Habitat for Humanity) and industrial surplus centers, machinist's shops, shooting ranges, gun and sporting stores. Coins are available from coin collectors and your own stashes. Lab refuse of used scalpels and metal hardware can be used.

Stone materials include granite, marble, river rocks, pebbles, washed sand-box sand, lithographic limestone, and epoxy-coated aquarium gravel or aquarium-grade natural pea-gravel. Stones are available from hardware stores, landscape suppliers, quarries and stone centers, garden centers, pet-stores, box stores and recycling building suppliers. If your community allows it, stones are also available from local streams. Kitchen-floor samples including manufactured counter-top materials and bathroom scraps, "sink holes", and design room sample squares are often free if you ask.

Glass and resin beads easily replace rice and bean use and available from science and craft suppliers.

MODIFYING MATERIALS TO MAKE WEIGHTS

Some materials need minor modification to make suitable conservation weights. Polish rough stone edges. Seal unpolished stone edges with sealants: Topical sealers (polyurethanes, acrylics); penetrating sealers to anchor material to surface (siliconates, fluoro-polymers, and siloxanes) and impregnating sealers (silanes or modified silanes). Use steel instead of lead to reduce toxicity (although not as heavy). Isolate lead, metal scraps, BB shot, and crumbly stones in:

- Tips of rubber-gloves. Makes nice small weights.
- Heavy plastic sheeting or bags. Note lead shot eventually rubs holes through even the heaviest of plastic, so expect to periodically service your pillow weights to replace the plastic.
- Sealed, rigid plastic containers (try not to drop them!).
- Embed in inexpensive poly (vinyl acetate) emulsion, e.g. "white glue".

Add smooth boards or thick felts to the bottom. Add handles for easier, safer pick-up and transfer on and off items. Cover weights that are meant to go directly against art and manuscripts with soft fabrics that won't harm. Examples are velvet, velveteen, chenile knit, ultrasuede, or charmuese. Cover pillow-style weights with leather or heavy fabrics such

as buckrum (book and box cloth), mattress ticking, upholstery, and Denier Cordura. Choose natural fibers for better pictures. Choose medium range colors to hide handling marks.

MAKING YOUR OWN CLOTH-COVERED WEIGHTS

Many free pattern instructions and tutorials are available in sewing blogs on-line. First determine your need: "Form follows function". Determine the size needed, the interior weight material, then the exterior material. Hand-sewing is possible if you don't have a machine. If you can sew a button, you can sew a weight. Heavy-weight upholstery, mono-filament, and leather sewing threads available. Reinforce the fabrics with heat-activated adhesive liners that create stiffer, longer lasting cover for better wear, provides further rigidity, and blocks weaving holes. Offset double sewing lines by differing the stitch length. Large nose funnels are helpful for filling bags.

Stephanie Watkins, Senior conservator, Watkins Conservation Services, LLC, Norcross, GA, swatkinswork@gmail.com