

Thanks to our generous conservation colleagues who contributed their opinions and experience. Special thanks to Jan Paris, whose curiosity and encouragement got us started.

<b>ADVANTAGES</b>	<b>Successfully treated originals</b>
Low- or no-moisture: suitable for water-soluble and water-reactive media; avoid distortion + tide lines; avoid reactivating mold damage	Iron-gall ink; copper-based media (Islamic mss, verdigris); brittle paper; art on paper with water-soluble media; colored papers; historic textiles; mold damaged or weak papers; Chinese papers (rubblings, books); transparentized papers; copy press books; thin papers
Customizable: your choice of repair sheet; pre-coating makes it possible to use a very thin mending paper (can't be pasted out, too hard to handle in wet-floppy state); can get very transparent mends	Double-sided manuscripts and art on paper
Speed: quick application and drying time	Circulating collections, batch mending projects; stabilization for large-scale digital projects; photographs mounted on boards
Portable: few tools needed, very little mess	Traveling exhibits and loans, on-site treatment
Reversibility: easy short-term removal lends itself to temporary applications	Leather spines; bridge mends and facings
Custom toning: before coating, after coating, even after mending	Leather and parchment bindings
Compatible: repair is aesthetically or materially compatible with original	Parchment texts and bindings; original pressure sensitive tape; short-fibered paper, clay-coated paper

<b>DISADVANTAGES</b>	<b>How to mitigate:</b>
Strength or flexibility of the repair (some are too strong/inflexible, some are not strong enough)	Experiment with adhesive type, dilution, preparation method, and with repair sheet thickness; if having trouble sticking, gel up the adhesive layer in damp pack or chamber
Undesirable plastic or sparkly look	Gel up the adhesive layer completely during application; experiment with plastic sheet that you are preparing on (i.e., matte polyester drafting film rather than shiny polyester)
Time & complication of pre-coating the repair material	Weigh it against time saved in application
Staining/tidelines are possible from in situ liquid application	Test application method on small area of original; avoid in situ application with originals likely to stain
No feathered edges	Pin tear; use a thinner repair sheet that will blend in
Inconsistent application of adhesive can make portions of the pre-coated sheet useless	Experiment with screening (window or silk-screens), different brushes; reconsider for other application use
Original has solvent sensitivity	Stick with cellulose ethers and wheat starch paste because long-term reversibility of acrylics isn't proven
Repair more dimensionally stable than original	In storage conditions with dramatic RH fluctuations, stick with thinner repairs made with cellulose ethers, which discourage biological attack
Adhesive aging characteristics and long-term reversibility questionable	See forthcoming CCI research

The following information is based on what pre-coated repair materials our colleagues reported preparing and using, and is not necessarily endorsed by the authors.

ADHESIVES	PREPARATION GUIDELINES	REACTIVATION METHOD
Methyl cellulose (A4M 4% and cooked Aytex P wheat starch paste thinned to skim milk, mix both and thin to yogurt consistency with water (O'Loughlin method))	<ul style="list-style-type: none"> <li>• Brush onto (matte) polyester film</li> <li>• Spray mist repair paper with water (except Berlin)</li> <li>• Drop repair paper onto adhesive</li> <li>• Let air dry</li> </ul>	<ul style="list-style-type: none"> <li>• May pre-swell in humidity chamber or damp pack</li> <li>• Water or 1:1 water/alcohol (low-moisture)</li> </ul>
Sodium carboxymethyl cellulose (Aqualon Cellulose Gum CMC 7H3SF PH) 4% in water (Baker method)	<ul style="list-style-type: none"> <li>• Brush onto (matte) polyester film</li> <li>• Mist repair paper (except Berlin)</li> <li>• Drop repair paper onto adhesive</li> <li>• Let air dry</li> </ul>	<ul style="list-style-type: none"> <li>• May pre-swell in humidity chamber or damp pack</li> <li>• 1:1 water/alcohol (low-moisture)</li> </ul>
Methyl cellulose (Dow A4M), 2% to 5% in water (Wagner method)	<ul style="list-style-type: none"> <li>• Brush onto (matte) polyester film</li> <li>• Mist repair paper (except Berlin)</li> <li>• Drop repair paper onto adhesive</li> <li>• Let air dry</li> </ul>	<ul style="list-style-type: none"> <li>• May pre-swell in humidity chamber or damp pack</li> <li>• 1:1 water/alcohol (low-moisture)</li> </ul>
Isinglass 10% in water	<ul style="list-style-type: none"> <li>• Brush onto (matte) polyester film</li> <li>• Drop repair sheet (fish intestine, goldbeaters skin or leather) onto adhesive</li> <li>• Let air dry</li> </ul>	<ul style="list-style-type: none"> <li>• 1:1 water/alcohol (low-moisture)</li> </ul>
Hydroxypropyl cellulose (Klucel-G), 2-5% in water	<ul style="list-style-type: none"> <li>• Brush onto (matte) polyester film</li> <li>• Mist repair paper (except Berlin)</li> <li>• Drop repair paper onto adhesive</li> <li>• Let air dry</li> </ul>	<ul style="list-style-type: none"> <li>• May pre-swell in solvent chamber or damp pack</li> <li>• Alcohol; for very thin tissues, reactivate with 2% Klucel-G in alcohol to avoid rinsing out the coating</li> </ul>
	OR	
Lascaux 498HV, thinned 2:1 up to to 4:1, water:Lascaux	<ul style="list-style-type: none"> <li>• Brush thinned adhesive onto silicone release film or mat</li> <li>• Continue to brush until stops beading up (~2 minutes)</li> <li>• Mist repair paper</li> <li>• Drop repair paper onto adhesive</li> <li>• Let air dry</li> </ul>	<ul style="list-style-type: none"> <li>• May pre-swell in solvent chamber or damp pack</li> <li>• Alcohol</li> </ul>
		OR
Lascaux 498HV, straight (thicker repair papers)	<ul style="list-style-type: none"> <li>• Squeegee adhesive through silkscreen onto silicone release film; rinse</li> <li>• Mist repair paper and adhesive</li> <li>• Drop repair paper onto adhesive</li> <li>• Let air dry</li> </ul>	<ul style="list-style-type: none"> <li>• May pre-swell in solvent chamber or damp pack</li> <li>• Alcohol</li> </ul>
		OR
		<ul style="list-style-type: none"> <li>• Heat</li> </ul>

# Adhesive Pre-Coated Repair Materials

Priscilla Anderson and Sarah Reidell

Book and Paper Group, LCCDG and ACDG

May 21, 2009

ADHESIVES	PREPARATION GUIDELINES	REACTIVATION METHOD
Lascaux 498HV and 360HV mix	<ul style="list-style-type: none"> <li>• Prepare as for Lascaux 498HV thinned or straight when you want more elasticity or flexibility.</li> </ul>	<ul style="list-style-type: none"> <li>• May pre-swell in solvent chamber or damp pack</li> <li>• Alcohol</li> </ul>
		OR
		<ul style="list-style-type: none"> <li>• Heat</li> </ul>
Lascaux 360HV, straight (Sheesley method)	<ul style="list-style-type: none"> <li>• Pipe adhesive onto repair paper, distribute adhesive between two sheets of silicone release mylar; remove top sheet</li> <li>• Let air dry with a tray to cover so no dust contamination</li> </ul>	<ul style="list-style-type: none"> <li>• Tacky at room temperature</li> <li>• Alcohol</li> </ul>
		OR
		<ul style="list-style-type: none"> <li>• Heat</li> </ul>
Texicryl 13-002, thinned 1:1 with water	<ul style="list-style-type: none"> <li>• Brush thinned adhesive onto silicone release film</li> <li>• Continue to brush until stops beading up</li> <li>• Mist repair paper</li> <li>• Drop repair paper onto adhesive</li> <li>• Let air dry</li> </ul>	<ul style="list-style-type: none"> <li>• May pre-swell in solvent chamber or damp pack</li> <li>• Alcohol</li> </ul>
		OR
		<ul style="list-style-type: none"> <li>• Heat</li> </ul>
BEVA 371 film (1-mil)	<ul style="list-style-type: none"> <li>• Heat-seal directly onto repair paper</li> </ul>	<ul style="list-style-type: none"> <li>• Heat</li> </ul>
BEVA 371 solution	<ul style="list-style-type: none"> <li>• Spray the BEVA solution from an aerosol</li> </ul>	<ul style="list-style-type: none"> <li>• Heat</li> </ul>
	OR	
	<ul style="list-style-type: none"> <li>• Coat repair paper with a solution of BEVA film and 1 or 2% petroleum benzine / VM&amp;P naphtha</li> </ul>	
“Modified” LC Heat-Set (Rhoplex AC 73 and Rhoplex AC 234)	<ul style="list-style-type: none"> <li>• Mix adhesives (1:1) and thin 1:1 with deionized water</li> <li>• Brush thinned adhesive (1:1 mix with deionized water) onto silicone release film</li> <li>• Continue to brush until stops beading up</li> <li>• Mist repair paper</li> <li>• Drop repair paper onto adhesive</li> <li>• Let air dry</li> </ul>	<ul style="list-style-type: none"> <li>• May pre-swell in solvent chamber or damp pack</li> <li>• Alcohol</li> </ul>
		OR
		<ul style="list-style-type: none"> <li>• Heat</li> </ul>
Toning Crompton coated tissue (commercially manufactured)	<ul style="list-style-type: none"> <li>• Tone with 1:5 mix of cellulose ether and deionized water, and liquid acrylic paints</li> <li>• Brush or spray application</li> </ul>	<ul style="list-style-type: none"> <li>• Alcohol</li> </ul>
		OR
		<ul style="list-style-type: none"> <li>• Heat</li> </ul>
Filmoplast R (commercially manufactured)		<ul style="list-style-type: none"> <li>• Heat</li> </ul>

**BIBLIOGRAPHY**

- Albro, Sylvia, Julie L. Biggs, Claire Dekle, Mary Elizabeth Haude, Cyntia Karnes, and Yasmeen Khan. Developing Guidelines for Iron-Gall Ink Treatment at the Library of Congress. *The Book and Paper Group Annual* 27 (2008):129-166.
- Anderson, Priscilla and Puglia, Alan. Solvent-Set Book Repair Tissue, *The Book and Paper Group Annual* 22 (2003):3-8.
- Baker, Cathleen A. Sodium Carboxymethylcellulose (SCMC) Re-evaluated for Paper, Book, Papyrus, and Textile Conservation. *The Book and Paper Group Annual* 26 (2007).
- Brückle, Irene. Update: Remoistenable Lining with Methyl Cellulose Adhesive Preparation. *The Book and Paper Group Annual* 15 (1996). <http://aic.stanford.edu/sg/bpg/annual/v15/bp15-03.html>
- Cains, Anthony. A Facing Method for Leather, Paper and Membrane. Sheila Fairbrass, editor, *Conference Papers Manchester 1992*, (London: The Institute of Paper Conservation, 1992) 153-157.
- Dekle, Claire and Mary Elizabeth Haude. Iron-Gall Ink Treatment at the Library of Congress: Old Manuscripts, New Tools. *The Book and Paper Group Annual* 27 (2008)15-26.
- Down, Jane L., Scott R. Willimas, Season Tse, Sherry Guild. The CCI Tapes and Heat-set Tissues Project. *PapierRestauration* 7:1 (2006) 13-17
- Feller, R. L., and M. Wilt. *Evaluation of Cellulose Ethers for Conservation*. The J. Paul Getty Trust, 1990. (165pp., 2.1 MB) [http://www.getty.edu/conservation/publications/pdf\\_publications/ethers.pdf](http://www.getty.edu/conservation/publications/pdf_publications/ethers.pdf)
- Inexpensive Forming of Ultra-Thin Paper Tissues: A method devised by the following members of the 1988 Paper and Book Intensive (PBI) Mending Group: Tim Barrett, Neal Bonham, Greg Campbell, Kathy Hanson and Lil Ohman, and recorded by Tim Barrett. *Abbey Newsletter* 12:8 (Dec 1988).
- Karsten, Irene F., and Jane Down. "The effect of adhesive concentration, reactivation time, and pressure on the peel strength of heat and solvent-reactivated Lascaux 360/498 HV bonds to silk." pp. 927-935 in *ICOM Committee for Conservation, ICOM-CC, 14th Triennial Meeting, The Hague, 12-16 September 2005: preprints, volume 2*. London: James & James / Earthscan, 2005.
- Kronthal, Lisa, Judith Levinson, Carole Dignard, Esther Chao, and Jane Down. "BEVA 371 and its use as an adhesive for skin and leather repairs: background and a review of treatments." *Journal of the American Institute for Conservation (JAIC)* 42, 2 (Summer 2003), pp. 341-362. [http://aic.stanford.edu/...aic42-02-009\\_indx.html](http://aic.stanford.edu/...aic42-02-009_indx.html)
- Lau-Lamb, Leyla. A New Material for the Conservation of Papyrus. *The Book and Paper Group Annual* 26 (2007).
- Newman, Walter. Preservation of New York's Bellevue Wall of Prayers. In *Edinburgh Conference Papers 2006: Proceedings from the Fifth International Conference of The Institute of Paper Conservation, 26-29 July 2006*, edited by Shulla Jacques, pp. 147-154. London: ICON Institute of Conservation, 2007.
- O'Loughlin, Elissa. Re-cap of airbrush session held during the AIC sponsored Master Inpainting class held at the National Conservation Training Center Shepherdstown WV May 5-9 2008. Website address: <http://thewalters.org/wcontent/files/pdfs/airbrushrecap.pdf>
- Quandt, Abigail. Recent Developments in the Conservation of Parchment Manuscripts. *The Book and Paper Group Annual* 15 (1996). <http://aic.stanford.edu/sg/bpg/annual/v15/bp15-14.html>
- Sheesley, Samantha. Artist Interviews for use in Conservation including: A Documented Interview with Siri Berg. Website address: [https://pacer.ischool.utexas.edu/bitstream/2081/9103/6/Sheesley\\_images.pdf](https://pacer.ischool.utexas.edu/bitstream/2081/9103/6/Sheesley_images.pdf)
- Wagner, Sarah. Remoistenable Tissue Part II--Variations on a Theme. *The Book and Paper Group Annual* 15 (1996). <http://aic.stanford.edu/sg/bpg/annual/v15/bp15-04.html>

For More Information Contact:

PRISCILLA ANDERSON  
Baker Library Historical Collections  
Harvard Business School  
email: [priscilla\\_anderson@hbs.edu](mailto:priscilla_anderson@hbs.edu)

SARAH REIDELL  
Barbara Goldsmith Preservation Division  
New York Public Library  
email: [sarah\\_reidell@nypl.org](mailto:sarah_reidell@nypl.org)