Article: Update: Remoistenable Lining with Methyl Cellulose Adhesive Preparation
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Update: Remoistenable Lining with Methyl Cellulose Adhesive Preparation

Irene Brückle

The merits of methyl cellulose, one of the most stable cellulose ethers, have been extensively discussed during past years.[1] A material with excellent aging characteristics, it has been found suitable for a variety of paper conservation treatments, among them, to name only some important ones, aqueous lining, sizing, consolidation, poulticing and temporarily supporting paper objects.[2] Especially as a lining adhesive, used separately or in mixture with wheat starch paste, methyl cellulose offers several advantages over the exclusive use of wheat starch paste. It allows the adjustment of the working properties of the wet adhesive and, more significantly, forms a discrete, flexible film upon drying. Unlike a dried wheat starch paste film of comparable thickness, it is almost free of distortions and contraction, and is easily reversible with only a moderate application of moisture. These useful properties make methyl cellulose ideal for one type of lining technique discussed here, the so-called remoistenable backing. The idea of preparing lining papers in advance of treatment by coating them with an adhesive film that is dried and later remoistened evidently was first experimented with in the 1980s by Bob Futernick, and was further developed by Cathy Baker. Her short, explanatory article appeared in 1990 in the *Paper Conservation News*.[3] Since that time, however, no update has been given on this lining method which offers an interesting alternative to other backing techniques aimed at reducing the amount of moisture contacting the object during treatment (so-called "dry" linings). In most of these treatments, the wetness and bulk of starch- or other water-based adhesives is adjusted during the lining treatment and before the pasted paper touches the object. Remoistenable linings allow even greater control over these crucial parameters and are therefore suitable for the treatment of particularly moisture-sensitive objects. The lining technique has been used on a variety of objects including drawings on fragile papers and planographic prints, and on crayon enlargements. In a series of experimlinings have been used for the support of unmounted, curled albumen prints.[4]

MATERIALS FOR LINING PAPER PREPARATION

- polyester film (5-mil Mylar®)
- polyester monofilament screening material: Pecap 76-T™(manufactured by Tetko, dist. by Reich Supply Co., 811 Broad Street, Utica, NY 13501) alternative: window fly screen
- high-viscosity methyl cellulose (Methocel A4M, manufactured by Dow Chem. Co., dist. by Fluka Chem. Corp., 980 South Second Street, Ronkonkoma, NY 11779
- wheat starch paste
- silk screen squeegee
- Japanese lining paper or tissue

TREATMENT STEPS

1. Combine one part wheat starch paste (2.5% w/v) with 2 parts methyl cellulose (2.5% w/v Methocel A4M). Avoid introducing air bubbles while mixing adhesives.

2. Lay a sheet of new 5-mil Mylar on the table. Place a smaller piece of Pecap in the center. Pour a generous amount of the viscous adhesive mixture along the top edge of the Pecap. Distribute the adhesive mixture by gently pulling the squeegee across the Pecap, starting at the edge to pick up the adhesive. Do not shift Pecap during treatment. Move squeegee evenly and preferably do not repeat motion after adhesive is deposited to limit the number of air bubbles forming in the adhesive layer. The adhesive should be spread in an area slightly larger than the lining paper to be attached. Peel off the Pecap at low angle.

3. Slightly dampen the lining paper, pick it up at diagonal corners, and slowly lower it onto the adhesive layer at a steep angle. Work slowly to prevent air-bubbles from being trapped between the lining paper and the adhesive. Small air bubbles will not affect the quality of the lining. No brushing required. Set the assembly aside for drying. Weight Mylar corners to prevent curling.

4. After drying, peel off polyester film from the lining paper to expose adhesive layer. Store prepared lining paper or use immediately.

5. Prepare object for lining by relaxing it in a humidity chamber (or using a Gore-Tex® sandwich, ultrasonic water vapor chamber, etc.) Prepare set-up for lining: 2 sheets spun-bound polyester web (Hollytex™ or other), smooth blotters, and set-up for weighting (e.g. Plexiglas®). Wait until object is sufficiently humidified.

6. Lay lining paper with adhesive side face up on a sheet of polyester web and only *lightly* mist the adhesive film with water. Wait for water droplets to react with the adhesive, and when no droplets are visible on the surface anymore (check in specular light), mist again. Repeat several times to swell the adhesive layer gradually and uniformly. Check for sufficient tack by tapping a corner of the lining paper with a finger. Blot moisture off of polyester web edges. If necessary, straighten out lining paper.

7. Remove object from humidification chamber (or other set-up) and position it on the lining paper. Cover object with a second sheet of polyester web, and set the sandwich between blotters under Plexiglas and weights. Apply moderate to high pressure and make sure pressure is even. Because the lining is conducted in almost dry condition, these steps should be carried out quickly to prevent the moistened adhesive from drying, and to keep the object evenly humidified during the procedure. Change blotters after 24 hours, and leave the object weighted for a few days.

NOTES

The thickness of the adhesive layer can be adjusted by varying the concentration and composition of the mixture, and by choosing an appropriate screening material. The weave of Pecap (76-T), for example, is comparatively fine and thin, and therefore produces a more discrete adhesive layer than the coarser structure of generic window fly screens, which can be used alternatively.

By modifying the amount of moisture applied to the dried adhesive film, the degree of adhesive tackiness or activation can be adjusted. Under all circumstances, however, the adhesive layer has to be moistened evenly to ensure its uniform attachment to the object. If the remoistening step is carried out unevenly or excessively, the adhesive will penetrate the lining paper further than during the initial preparation, which can result in a mottled pattern on the reverse of the lined object.

Aside from a variety of *kozo* papers and tissues, *gampi* paper has been used for the remoistenable lining of distorted objects (e.g. tracing papers) to counteract their tendency to curl.

Remoistenable linings are probably most useful for the support of moderately-sized objects and for objects that are returned to relatively stable climate conditions. First, the lining steps have to be carried out swiftly which can be more easily accomplished with objects that allow relatively easy handling. Second, a remoistenable lining may not support large or heavy objects because the bond between the remoistened adhesive and the object may not be strong enough. Third, the lining is relatively easily reversed due to the hygroscopicity of methyl cellulose, and should not be used for supporting objects that will be stored under very humid storage conditions.

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[1] R. Feller et al., *Evaluation of Cellulose Ethers for Conservation*, The Getty Conservation Institute, 1990. C. Baker, "Methylcellulose and Sodium Carboxymethylcellulose: An

Evaluation for Use in Paper Conservation Through Accelerated Aging", *Adhesives and Consolidants -IIC Paris Congress Preprints*, N.S. Bromelle et al., eds., London, England, IIC, 1984: 55-59. Jirina Strnadova and Michael Durovic, "The Cellulose Ethers in Paper Conservation", *Restaurator*, 15 (1994): 220-241.

2 C. Smith et al., compilers, "Adhesives", *Paper Conservation Catalog*, The Book and Paper Group, AIC: 103.

3 C. Baker, "Polyester Screening Material: Uses in the Paper Conservation Lab", *Paper Conservation News*, 55, (Sept. 1990): 11.

4 Unpublished student project carried out by Lee Ann Daffner, Art Conservation Department, Buffalo State College, 1993. The idea of testing the application of this lining method on albumen photographs grew out of Paul Messier's research, "Work in Progress: An Analysis of the Effect of Water on the Cracking of Albumen Photographs", *Topics in Photographic Preservation*, Photographic Materials Group, AIC, 1991: 170-178.