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INSTRUCTIONS FOR USE OF BEVA®371 SOLUTION AKRON FORMULA

This formulation has been optimized for heat-set activation at 65 °C and is the result of research carried out in collaboration with The Conservation Center at the Institute of Fine Arts, New York University and The School of Polymer Science and Polymer Engineering, University of Akron through the Getty Foundation's Conserving Canvas initiative.

All work with BEVA adhesives should be performed in a well-ventilated room.

Preparation of the adhesive

From a fresh can of BEVA 371 remove about one pint and add about the same volume of VM&P naphtha or xylene (if you want to retard drying), or a mixture of both, making it a 37% solution. Cover the can but do not close it, then warm in a double boiler until solution is clear and liquid. Stir occasionally.

In this form, BEVA is the standard adhesive for lining, and can be applied to both the old canvas and the new support. The most suitable manner of application is with a medium nap paint roller. The roller may be immersed directly into the can, or the pan often sold with the paint roller may be used. When through, the excess BEVA in the roller may be squeegeed back into the can, the roller removed from its holder, and immersed in a well-covered jar of naphtha until needed again. If frequently used, the roller might be kept moist and pliable by wrapping ft in thin Mylar. There is virtually no waste, even the contents of the storage jar can later be used for facings.

Preparation of the painting

The painting is prepared for lining, as might be required in each case, performing one or all of the following operations, usually in the order listed below:

1. "Face" painting, If necessary.
2. Remove painting from stretcher and flatten tacking edges.
3. Reattach loose paint (if necessary, consolidate entire painting) using BEVA (1) or your favorite method.
4. Join the tears, fill losses (2). If losses were badly filled before, the old varnish must be removed, and the fillings corrected.
5. Revarnish the painting for protection.
6. Place painting, face-down, on a board covered with silicone-coated paper. Tape tacking edges the board so the painting would not move. Level the back of the painting carefully with a scalpel shaving off all protruding knots, burls and ridges of canvas weave. Do not sand it.
7. Correct deformations in the plane of the painting by vapor-treatment.
8. Depending on the desired degree of penetration, either coat the back of the painting with BEVA, or spray with an 8-10% solution of BEVA in naphtha and/or toluene (1:3 or 1:4). Allow to dry overnight.

It is best to perform all operations with BEVA at the end of the day so as not to remain exposed to the solvent fumes for too long.

Preparation of the lining Fabrics

Some of the steps in the preparation of the painting require time to dry. These pauses may be used to prime the lining fabrics with a spray-coating of either BEVA 371 or BEVA D-8.

Berger used the following lining laminate:

- A sandwich layer of fine, flexible Dacron-Polyester (the finer and more regular the weave, the better).
- A Mylar Interleaf (optional).
- A backing fabric.

While the sandwich layer and the backing fabric may be prepared in large sheets well ahead of time, stored indefinitely, and cut to size when needed, the Mylar interleaf should be made as the very last step before the actual lining.

Preparation of the Sandwich Layer and the Backing Fabric

The fine Polyester fabric is lightly tacked to a large strainer and sprayed with a thinned solution of BEVA 371 or BEVA D-8 from both sides, then left to dry.

The backing fabric is prepared in a similar fashion, except that spraying with BEVA is done on one side only, the side which will be attached to the laminate.

Preparation of the Interleaf

A piece of heavy Mylar (5 - 7.5 mil thick) is cut about 2-3 inches larger than the painting to serve as interleaf. It provides the lining with sufficient stiffness to resist deformation, and it forms a good moisture barrier.

The cut piece is lightly tacked to a board, covered with silicone-coated paper. The interleaf is coated with a continuous coat of BEVA 371. Since Mylar does not absorb any BEVA, this coat dries in about 15 minutes. The Mylar is then inverted, and its reverse coated with BEVA 371.

The dry Mylar is placed on a carefully cleaned cardboard.

The painting is placed on top of it, "face-up". The outline of the painting is marked on the Mylar with a fine felt-tip pen.

The painting is removed, and an additional line is marked within the out-line, about 1/8" inside the borders.

The interleaf is cut along the inside line to be slightly smaller than the painting. Because paintings are often irregular, it is better to cut the Mylar with scissors. This should be done immediately preceding lining, in order to prevent contamination of the Mylar.

Assembling the Laminate

The vacuum hot-table is carefully cleaned. It must be remembered that the vacuum table accentuates every unevenness, be it on the table or within the laminate. Therefore, each layer of the laminate should be carefully inspected for any impurities before being put for lining.

The following steps are to be taken:

1. Cover the table with a sheet of Mylar, about 1-1.5 mil thick. This instead of silicone-coated paper which seldom lies flat on the hot-table (experienced practitioners can easily dispense with this step, since there is practically no danger for the BEVA penetrating the backing fabric, if properly prepared).
2. Place backing fabric on the Mylar or hot-table, with the side which was sprayed with BEVA facing up.
3. Put dry, precut interleaf on top of the backing fabric, and align carefully with the threads of the backing fabric.
4. With a tacking iron press down lightly two adjacent corners of the interleaf to the backing fabric to make sure it will stay in the aligned position.
5. Put sandwich layer on top of the interleaf. With a pencil or chalk mark the continuation of the outlines of the interleaf on the sandwich layer. Starting from the center, smoothen it lightly with both hands.
6. While the painting is still on a board, cut the four corners of the tacking margins, so that the painting can be aligned within the outlines marked on the sandwich layer (if trimming of the tacking margins is unacceptable, register-marks can easily be drawn to show the exact position of the corners).
7. Place painting on the sandwich layer 'face-up' and align it with the help of the register marks. Press down lightly to attach the layers in perfect alignment.
8. Put "breathers" around the edges of the painting.
9. Cover laminate with the membrane, and evacuate the air.
10. Do not start heating the table immediately. This permits you to check the laminate once more, this time under pressure. It also assures better evacuation of the air which might otherwise be hampered once the different layers fuse together.
11. Heat table until surface temperature of the painting reaches 150° F (65º C) in all parts of the painting. At least five paper thermometers should be used for each thermal blanket heating the table, one in each corner and one in the center. Do not rely on electronic thermostats and/or contact thermometers alone.
12. Allow to cool slowly, under pressure, to at least 85-90° F. The latest stress measurements carried out by Russell and Berger have shown rapid cooling to be stressful to paintings.

Please, note that the assembly of fabrics in the above described laminate has been worked out to alternate a porous layer with a non-porous one in order to assure a good evacuation of air and a proper distribution of pressure within the laminate. This permits lowering the vacuum pressure to a minimum, although a stronger vacuum often assures a better looking lining. Also note that with the above arrangement the use of a membrane is not absolutely required. Consequently, the vacuum can be arranged to join the layers of the laminate without applying pressure to that face of the painting. In addition, alternating porous and non-porous layers facilitates the reversibility of the laminate.

Miscellaneous Uses (3)

Facings: Thin BEVA 371 with VM&P naphtha (1:1). Because BEVA will stick to a wet surface, wet-strength tissue may be placed in the usual manner for a facing, and wetted and tamped into the most rough surface with a soft brush. The BEVA facing mixture can then be rolled or brushed immediately over the wet facing. Do not go over areas of drying BEVA a second time, the facing may lift. Process as required on hot table between sheets of silicone paper, when dry.

Blisters: Prepare a mixture of BEVA 1:4 or 1:3 with VM&P naphtha. This may be flowed into the cracks and crevices of the paint, or injected under the paint layer, warm. Let dry 24 hours, cover with a small piece of silicone paper and flatten with a tacking iron. Blisters may be faced, if required.

Removal of Facings: Spray or flow VM&P naphtha over sections about one foot square at a time, cover with a piece of Mylar, and warm slightly for two or three minutes. Facing will then peel directly off. Alternate method, cover faced painting with a piece of newspaper (one foot square) and wet well with naphtha. Proceed as above. Facing should peel off attached to the newspaper. Clean face of the painting with naphtha, removing all traces of BEVA.

Vapor Treatment: To flatten heavily cupped or deformed paint films vapor treatment is best performed before BEVA is applied. This treatment is not without hazard, and requires extensive study and experience (1,2,3).

Fixing Minor Flakes: Lightly transfer 1:3 BEVA-naphtha mixture, preferably warm, From point of brush to edges of flaked paint. It will immediately draw around and under flakes: Cover with facing paper and press down to remove excess BEVA which might form a ridge under the paint. This precaution is important in interlayer de-lamination or on non-absorbing grounds. Allow to dry 24 hours. Cover with a piece of silicone paper and flatten with tacking iron.

IMPORTANT NOTE: It is imperative to employ silicone paper above and below all work whether linings or small tacking jobs. BEVA will stick to Teflon coated irons, mylar, and everything else. NEVER use BEVA directly when mounting a painting on any hard, inflexible support. ALWAYS put a piece of fine fabric on the solid support first.

Removal of a BEVA lining: To remove a BEVA lining, place the painting on the hot-table, apply (by brush or spray) VM&P naphtha to the back of the lining and cover with a sheet of Mylar. The hot-table should be preheated to about 120º F. Wait about five minutes and test to see if the lining can be peeled. If not, repeat the above process. When BEVA has been softened to the proper degree, the lining will release without stress to the old canvas. If the painting is large, this may be done in sections.

REFERENCES:

1. G.A. Berger, "Consolidation of Delaminating Paintings", Preprints to the ICOM Meeting in Zagreb (1978).

2. G.A. Berger, "Heat-Seal Lining of a Torn Painting With BEVA 371", Studies in Conservation, 20, No.3 (1975).

3. G.A. Berger, "Unconventional Treatments for Unconventional Paintings", Studies in Conservation, 21, No.3 (1976).