

SEVEN HELPFUL HINTS FOR USE IN
PAPER CONSERVATION

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1. GRATED ART GUM ERASER FOR DRY CLEANING: There are a number of commercial powdered erasers on the market today including Opaline, Skum-X, and Trace Clean. All of these appear to be made up of a powdered eraser and some of them have particle sizes ranging from a very fine powder to relatively large chunks of eraser. Sometimes this range can be found in one sample of a powdered eraser. The type of eraser powdered also varies within the same brand name. For example, I have used Opaline which looked, smelled, and felt different from another package of Opaline. Some of these eraser bits are so large and hard that I prefer not to use them for fear of abrading the paper. However, the idea behind a powdered eraser which you can simply dust on and gently rub over the paper surface to dry clean it is good and useful. The problems lie in the effectiveness of such an eraser to remove dirt without abrading the surface, and in its subsequent removal from the paper. If the powdered eraser is too fine a powder, it is certainly going to be trapped in the interstices of the paper surface, and be almost impossible to remove completely.

Some time ago, I started to make my own grated eraser primarily using an art gum eraser, Faber-Castell #211. By simply grating the rubbery eraser against a metal or plastic food grater (the kind used to grate cheese or vegetables) one can get a very soft crumb-like eraser which rolls very easily over the paper surface with little or no abrasion. As it collects dirt it tends to turn color very quickly and it is easy to see how effectively it cleans. As it collects dirt, the particle size decreases, and you should remove the eraser crumbs before they become so small that they will be trapped in the paper fibers. Because you make the crumbs from a known eraser (and many types of eraser can be used although vinyl erasers are rather hard to grate), you are controlling the materials you are using - you are not relying on the manufacturer's supply at any given time.

2. JAPANESE PAPER HINGES: The most common hinge used to join a paper artifact to a backing board in a mat or similar procedure, is a Japanese paper hinge. Usually this hinge has water cut edges so that the feathery edges bind unobtrusively to the paper surface causing no ridge. The size of the hinge, how much of it is applied to the paper, which adhesive is used, etc. are all governed by the conservator and the situation. However, there have been complaints recently that hinges made from Japanese papers are failing. It is not known whether this is due to inferior grades of Japanese paper or to the adhesive. In most

cases, conservators use good quality materials, and these are probably not at fault. A simple explanation may be in the structure of the hinge itself.

Handmade Japanese paper usually has a definite grain direction. This is due to the predominately back-to-front motion of the pulp across the mould or su. As the layers are built up with each dip, this grain direction is emphasized so that many more fibers are parallel to the chain lines of the su than to the laid lines. Consequently, the paper will be much stronger in terms of tear strength, fold endurance, etc. across the grain direction than with it. It is important therefore when making a hinge which may be repeatedly folded or flexed that it be made so that the grain direction is perpendicular to the top edge of the paper artifact. This will make a much stronger hinge than one made with the fibers going in the other direction. The same observation is of course true for tear repairs and backings.

To make a strong hinge then, take the Japanese paper which you want to use, and determine where the chain lines are. If the paper is so thin that you cannot tell where they are, or if it is a wove paper, try dry-tearing the paper to see which way the grain direction runs. Thin papers may not have pronounced grain directions as there are fewer layers. In Japanese papermaking, the initial dips tend to be ones more equal in terms of back-to-front and side-to-side motion in order to put down an interwoven mat of fibers on the su to evenly cover it. This is so that successive layers of fibers will not "fall through the cracks".

Once you have established the grain direction, wet-tear the paper into the shape you want. For small hinges or strips of paper for repairs, I often fold the paper first, and then run the fold line over my tongue to slightly wet it, and then tear. This method is quick, easy, and always available!

To make sure that you have the hinge running the right way, use the chain lines as the side edges of the hinge. Since the chain lines are weak areas in the paper, it is probably best to leave them out of the hinge in any case. You can now paste up the hinge and apply it in your usual manner.

3. STARCH PASTE STORAGE: Starch paste adhesive is probably the most commonly used one in paper conservation. In most labs., the paste is cooked every week, and storage for long periods exceeding a week is often not necessary or possible without the addition of a fungicide. However, framers, mat cutters, and other casual users of starch paste are often frustrated by the fact that the paste does tend to spoil in a very short period of time. They do not want to cook up a fresh batch every time they need to use the paste for hinging or remedial repairs. Therefore these people seldom use starch pastes and resort instead to any of a number of self-adhesive tapes; or chemically modified pastes which do not spoil as fast but which may not age as well as the cooked pastes; or may use an adhesive like methylcellulose which does not have strong adhesive properties making it untrustworthy as a hinging adhesive in some cases.

Therefore an easy way of storing a starch paste for long periods of time could be very useful. Keiko Keyes introduced me to the idea of storing the paste in a container in which the fungicide is stored in a

pad of cotton wool underneath the lid of the container. The fungicide then slowly volatilizes over the paste keeping it sterilized. This eliminates the necessity of putting a fungicide directly in the paste. She recommended the fungicide thymol dissolved in ethanol. We have used this system quite successfully for a number of years and have kept paste for several months.

When problems concerning thymol as a possible carcinogen began to be voiced, we tried another fungicide, ortho-phenyl phenol. We tried using ortho-phenyl phenol (as found in Lysol and as a reagent) in much the same way as the thymol solution in a pad under the container lid, but noticed that the paste went yellow and slimy after a few days. The conclusion was that unlike thymol, ortho-phenyl phenol does not volatilize fast enough to preserve the paste. We then added a 0.2% ortho-phenyl phenol in ethanol solution directly to the paste (2ml per 150ml paste), and had no problems with spoilage for several weeks. This may be the safest way to keep paste if you cannot use thymol safely even though it does necessitate adding the fungicide to the paste - something which may affect its aging. If you do have access to proper ventilation facilities, you may wish to use thymol also taking proper precautions when handling the solution. The 10% thymol w/v in ethanol solution must be kept in an air-tight bottle.

The container is swabbed out carefully after washing and drying with a fungicide - either Lysol or the thymol solution can be used for this. A pad of cotton wool is made and strapping tape (fiber tape) is used to secure the pad to the underside of the lid. It helps to split the tape lengthwise to expose as much of the pad surface as possible. The thymol solution is then squeezed into the pad with an eyedropper until it is nearly saturated but not dripping. It helps a great deal to put the cold cooked paste directly into the sterilized container without either straining, sieving or blending it. All of these operations introduce air and mold spores into the paste which hasten spoilage. Also if the paste can be scooped out of the pan with a spoon, and put into the container without making any attempt to smooth the mass down, you can expose more surface area of the paste to the fungicide. It also helps to fill the container no more than half full. This too insures more thymol vapors in contact with the paste surfaces. Obviously keeping the lid well sealed, and replacing it immediately after the required amount of paste has been removed will help, too. It should not be necessary to renew the thymol solution in the pad except when a new batch of paste is made. If the pad becomes hard, it should not be re-used. It and the tape should be replaced. Remember to follow precautions when handling the thymol solution, when preparing the container, and when removing the paste from the container. Do all procedures in the fume hood to avoid breathing the vapors, and wear gloves to protect your hands from the thymol and the ethanol. Dispose of the used pad, tape, eyedropper, etc. carefully.

4. MAT CUTTER GUIDE: For those who do not have expensive mat cutters available to them, small, portable, inexpensive mat cutters such as the Dexter are a blessing. However, there are several problems associated with its use that have discouraged users. One problem has been the tendency of the cutter to slip around when cutting a window espe-

cially one with long sides. The other has been a tendency for the cutter to burnish the surface of the mat.

These problems can be solved fairly easily and inexpensively. If a heavy, metal straightedge is clamped to the end of a table, it will serve as an effective guide for the cutter while allowing easy movement and turning of the mat between cuts. If an especially long line is being cut, both ends of the straightedge should be clamped. If not, only one is necessary. If you do not have a long enough straightedge, any rigid, nonwarping material will do. To make the bevel cut, simply mark out the window with a lightly drawn pencilline, and position the cutter blade in a corner keeping the window to your left. Next move the straightedge over so that it rests against the left side of the cutter. Line up the window pencilline so that it is parallel to the straightedge allowing as much space between the pencil line and the straightedge from the top corner to the bottom corner. You should then be able to push the cutter with your right hand while effectively holding down the straightedge and mat with your left. (Sorry left-handers: this is almost impossible for you. Ask Dexter to make a left handed cutter.) Once the cut has been made remove the cutter, place aside with the blade point up to protect it, and while lifting the straightedge with your left hand, turn the mat around clockwise so that the cutter blade will go into the bottom corner which you just cut. Once three cuts have been made, you need to take special care while approaching the end of the fourth. As you near that corner which you started with, slow down without stopping, and push the cutter into the corner very slowly. If you push too hard, the cutter will go past the corner and cut the mat margin. This is because that corner is already cut, and offers no resistance to the blade.

To avoid burnishing the mat surface, cut a strip of paper or non-woven polyester material the width of the cutter and the length of the longest cut. Place the strip under the cutter after you have positioned it and the straightedge on the window pencil line. This strip will protect the mat surface, and can be used over and over again.

5. STORAGE OF 3M #415 DOUBLE-SIDED TAPE: The double-sided tape which has been used commonly in Mylar encapsulation and other conservation treatments does tend to collect dirt along its edges while still on the roll. To protect against this, store the rolls in Ziploc-type polyester bags. We have found that in hot weather, especially, the tape keeps better and is easier to handle if stored in the refrigerator.

6. SEALED PACKAGE FOR FRAMING: In environments where dirt, dust, insects, and/or excessive humidity are problems, it is advantageous to seal a matted artifact on paper or parchment in a package before framing it. There are several ways to do this utilizing polyester film and self-adhesive tapes which attach to the glazing. However, this can prove to be a problem in that the tape usually becomes stuck to the edges to the mat. If the artifact is the same size as the mat, there is a real danger that the tape will become stuck to the edges of the artifact.

The following procedure eliminates tape touching the mat or the artifact and is easily reversible. After matting, clean both sides of

of the glass. A piece of thin, .92-mil Mylar (type D, polyester film) is cut so that it is larger than the mat by at least 3 inches on all sides. It is smoothed out on a clean table top with a soft brush. The mat is placed face-up in the center of the Mylar sheet. The glass is placed carefully on top of the mat, and is centered. Double-sided tape (3M #415, ¼ inch wide) is attached to the top edges of the glass using a bone folder to smooth it onto the glass surface. If a strip thinner than ¼ inch is required so that the tape will not show once the frame is in place, you may adhere only half of the width of the tape to the glass. Using a sharp blade trim the excess tape using the edge of the glass as a cutting guide. You may then attach this excess strip to the opposite side of the glass. Once the four edges of the glass are covered with tape, remove the brown paper from one strip. Pull the Mylar up and over, so that it attaches to the tape. Using a bone folder, smooth the Mylar onto the tape. Holding a sharp blade so that it rests flat on the glass, and holding the excess Mylar with the other hand, trim the Mylar as close as possible to the inside edge of the tape. Repeat the procedure on the opposite side of the glass. Do the other two sides. The excess at the corners can be trimmed, or folded and secured with a bit of tape. Take care that you do not trim the Mylar by running the blade perpendicular to the glass as this could score the glass, and result in breakage.

All the tape therefore is covered by Mylar, and is adhered to the glass only. (It is easy to reverse this by simply pulling away the tape.) The package can then be placed in the frame. Because the mat is sealed, those annoying bits of wood and dirt from re-used frames cannot end up on the mat or the artifact once the framing is complete. Also except for securing the package in the frame, the entire procedure is done with the artifact face-up. The Mylar isolates brads or other materials used to secure the package in the frame from the mat backing board.

An additional dust cover can be placed over the back of the frame using the same double-sided tape. This eliminates the use of messy glues, and having to wet the paper so that a tight fit is insured.

A hint if you have to clean off small amounts of the tape adhesive from the glass - try water or saliva rather than a solvent such as acetone.

I have not done any tests on the compatibility of this double-sided tape on surfaces such as Plexiglas, Perspex, Denglas, etc., and subsequent reversibility. I would recommend testing before proceeding if you are using any glazing other than glass. If UF3 Plexiglas has to be used in a frame, I have put glass over the UF3, and sealed the package in the above manner. Newton rings formed between the plastic and the glass are a problem, but these can be reduced by placing double-sided tape covered with Mylar on the underside edges of the glass next to the plastic, thus separating the two glazings microscopically.

A word of caution here: double-sided tape adhesive does seem to have oozing tendencies when subjected to warm temperatures. For this reason, a sealed package or any use of this tape might have to be avoided in tropical climates or in excessively heated rooms. It is also not recommended that framed, sealed packages be positioned over radiators or in direct sunlight (not that they should be in any case).

7. STRETCH-PRESSING: There are a number of occasions when pressing an artifact between blotters and weights or in a press is either undesirable or not feasible. Pressing in the traditional sense is undesirable when 1) there is a pronounced platemark on a print, 2) when there are pressure-sensitive media on the surface of an artifact including seals, or 3) when the paper is not in plane and cannot be fully relaxed. The unfeasible situations might include artifacts which are too large for normal pressing equipment, or when pressing has to be done where equipment is limited or nonexistent. Stretch-pressing is an alternative to traditional pressing and does resemble in many ways Japanese drying screen techniques.

The equipment is usually already at hand in most paper conservation labs or can be acquired easily without going to a lot of expense. You need enough weights, small lead weights are fine but any heavy objects which are long and narrow will do. There must be enough weights to cover the perimeter of the artifact with gaps between weights not exceeding 2-5 inches depending on the size of the artifact. You will also need strips of blotting paper, 3-4 inches wide, to go around the perimeter of the artifact - about 3 strips thick to go under the artifact, and 3 strips to go on top. In addition you will need strips, 3-4 inches wide, of a release material such as nonwoven polyester: Hollytex, Pellon, or Reemay, etc. (not silicon paper!) There should be one strip of this to protect the bottom and the top of the artifact, and they should be the same length as the blotting paper strips. Also needed are pieces of plate glass, Plexiglas strips or pieces of thick cardboard which go under the weights and on top of the edges of the artifact to evenly spread the weight. Lastly you will need some way of relaxing and gently expanding the artifact with moisture. A good quality mister can be used to spray both sides, or humidification in a chamber or between slightly dampened blotters will do.

To set up for the stretch-pressing, clean a smooth, flat table top, and lay either thin blotting paper, a nonwoven polyester or some other clean material to keep the artifact from resting directly on the table surface. This material is to absorb some moisture but should not cockle appreciably when humidified. Also it will help the artifact dry from both sides more evenly as the stretch-pressing takes place. Next arrange the strips of blotting paper and release material on the table so that the edges of the artifact will cover half of the strips. Sometimes it helps to tape these strips to the table so that they do not move around. Have the other set of strips ready to go on top of the artifact.

The artifact is now gently humidified in order to relax and expand it without getting the paper wet. Both sides should be done if possible. Once the paper is relaxed, place the artifact carefully on the strips of blotting paper already in position. Quickly place the second set of strips with the release material next to the artifact, covering each edge as little as possible, but by at least an inch. Place the glass plates strips or cardboard, etc. around the perimeter covering the edges completely. Next the weights are placed as evenly as possible around the edges. There should be nothing on the top of the artifact except at the edges. At this point the paper should be resting on the material covering the table top. As the paper dries, it will start to contract. It is very important to watch this procedure, and to monitor the con-

traction by gently pressing the center of the paper periodically. If the paper is contracting too much, quickly pick up the weights on two adjacent sides, and put them immediately back into place. This will release the tension in the paper, and will prevent tearing. If necessary release the tension in this way until just before the paper is completely dry. At the end of the stretch-press, there should be some tension or else this method of pressing will not be very effective. It is important to insure that the paper is completely dry and acclimated to the ambient relative humidity and temperature before it is released from the stretch-pressing. For stubborn pieces, it may be necessary to do this procedure a few times.

One advantage to this procedure is that you can see the entire surface of the paper (except for the edges) at all times. Also it is easy to stop by simply removing all of the weights from at least two adjacent sides. However, it is important to realize that artifacts that are weak, brittle, or badly damaged by tears or by weak fold lines either should not be stretch-pressed or that much care should be taken in insuring initially that the paper is not relaxed too much: the more expanded the paper is before pressing, the more it will contract upon drying.

An alternative to weights is the use of C-clamps to hold down the glass plates, etc. When releasing tension, it is much easier to simply turn the screw on the clamp to loosen slightly, then retighten. In this set-up, the system is placed in the corner of the table. Weights are placed on the two sides not on the corner while the clamps are used on the corner sides.

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