

PRESERVATION LEAFLET

CONSERVATION PROCEDURES

7.5 Humidification and Flattening of Paper

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INTRODUCTION

Paper objects such as maps, posters, and documents can be difficult to access if they have been rolled tightly or folded for many years. While some papers remain flexible and can be easily and safely opened, others become stiff and brittle as they age resulting in tears and losses when handled. When stiff papers are humidified, they relax and temporarily become more flexible, and unrolling or unfolding can be less risky.

The most practical way to humidify paper is to use a simple homemade humidification chamber. The steps involved in relaxing and flattening paper may appear simple, but to be done with as little damage to the artifact as possible, it is crucial that materials to be flattened are carefully selected, and that proper techniques are used.

SELECTING ARTIFACTS FOR HUMIDIFICATION

The safest way to relax a paper artifact is to leave it for several hours in an environment where the relative humidity approaches 100%. This exposure to moisture is not recommended for some materials. Therefore, each object being considered for humidification should be carefully examined.

Some papers may have water-soluble media that could bleed or feather during the humidification process. Such media include most felt-tip pen inks, certain writing inks (especially reds), and some hand-applied colors (especially on maps). If a rolled or folded item is known to have any of these more sensitive media, the object should be regularly monitored throughout the process to prevent feathering or bleeding.

Objects best left to professional conservators include:

- works of art or artifacts of high value;
- objects with delicate media such as pastel, charcoal, gouache, or soft pencil;
- coated or varnished papers (because the coating may become sticky, or the varnish may bloom (turn cloudy));

- extra-heavy papers, items mounted on board;
- parchment (because humidification can cause permanent damage, and the drying of this material is complex).

CLEANING

Once testing has determined that no water-soluble media are present, make certain the document is as clean as possible. Cleaning is important because moisture can "muddy" surface dirt and cause it to become more firmly attached to the paper. Luckily, if the item has been rolled or folded for many years, most of the dirt will be on the outside. Although overall cleaning may not be possible with rolled or folded materials, the exposed part of the artifact can be swept with a soft brush or cleaned with a dry-cleaning sponge. For more information on dry cleaning, see NEDCC Leaflet 7.2 "Surface Cleaning of Paper" at http://nedcc.org/resources/leaflets/7Conservation_Procedures/02SurfaceCleaning.php.

HUMIDIFICATION

The safest way to add moisture to paper is to leave it for several hours in a tightly closed space with a source of humidity. There are several ways to make a humidification chamber but the ones described below are inexpensive and the components are easy to find. More chambers are described in the articles in the "Additional Resources" section at the end of this leaflet.

NOTE: exposing paper to high humidity for prolonged periods is usually not recommended because of the potential for mold growth. However, a few hours in the humidification chamber will do no harm if the artifact is allowed to dry soon after it has been unrolled.

Necessary Supplies

1. A large, long, shallow bin with a tight fitting lid (for example, an under-the-bed storage bin)
2. Sheets of clean blotting paper
3. Nylon window screening
4. Spun polyester (Holtex or Reemay)

If the rolled objects are too long to fit the largest bin available, a tall chamber can be made by using two large plastic garbage cans of the same size.

Procedure

Begin the humidification process early in the day. It may take several hours, and objects should never be left in the chamber overnight.

Using a plastic bin:

1. Line the bottom of the bin with a piece of blotting paper and pour in enough water to wet the blotter. Any excess water should be removed. If blotting paper is not available, get a small white towel wet, wring it out, and fold it to fit into the bottom of the bin.

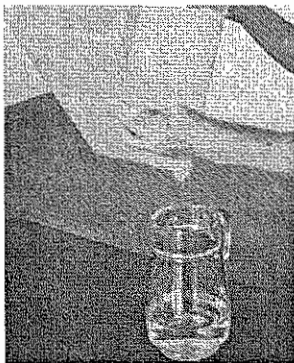


Image1: Draining excess water from blotter

2. Place 4-5 layers of nylon window screening on top of the damp blotter/towel.
3. Place a piece of spun polyester on top of the screening.
4. Place the rolled or folded items on top of the polyester.

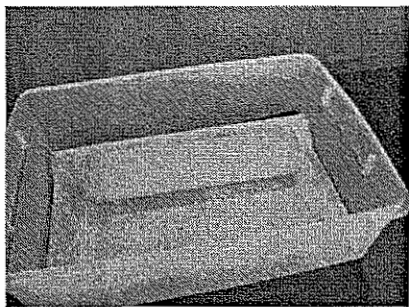


Image 2: Rolled item in bin, ready for lid

5. Fasten the lid.
6. Wait. Check the items after 2-3 hours depending on the weight of the paper and the number in the bin. If they are not completely relaxed, replace lid, wait another hour, and check again. Repeat until the items have relaxed.

Do not leave objects in a humidity chamber for more than eight hours as this can lead to mold growth. Some heavy or non-absorbent papers may not relax in that time. If they are

still stiff and resistant, do not unroll or unfold. Allow them to dry completely in their rolled state, then wrap and store them until a conservator can flatten them.

FLATTENING

Necessary Supplies

1. Sheets of clean blotting paper larger than the unrolled/unfolded items
2. Spun polyester (Holytex or Reemay)
3. Stiff, smooth material like Plexiglas or masonite the same size or larger than the blotters
4. Weights

Procedure

Remove the relaxed objects from the humidification chamber one at a time, replacing the lid each time. Place the item on a piece of dry blotting paper lined with a piece of spun polyester and unroll it. Handle items carefully: damp paper can be fragile, especially if it is already torn.

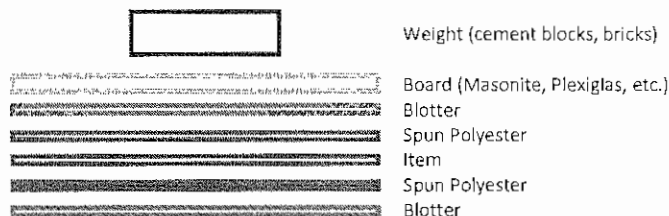


Image 3: Flattening/Drying package

As each artifact is unrolled, it should be placed in a flattening/drying package according to the image above. If using wood products for the top board, it must be flat and smooth, without any warping. Weight with bricks, cement blocks, or other heavy objects placed evenly across the board. Change the blotter sheets after 30 to 45 minutes, and leave the object weighted until it is dry. Several artifacts can be dried in a stack with blotters between each.

Although most photographs can be safely humidified, photographic emulsions may soften slightly, so extra care is necessary during flattening. Be sure to use the smooth side of the blotter and a very smooth spun polyester (like Bondina or Holytex) or silicone release paper on the emulsion side of the photograph when flattening, and use less weight than for paper items.

CONCLUSION

The humidification and flattening process will not necessarily remove all distortion from the paper, especially for items that have been folded, nor will items come out perfectly flat. The goal of this process is to make these items flat enough for access and storage purposes.

ADDITIONAL RESOURCES

Local Records Preservation Program. "Humidification and Flattening of Documents," Missouri State Archives, Office of the Secretary of State: Conservation Service Notes. <http://www.sos.mo.gov/archives/localrecs/conservation/notes/humidification.asp>

National Parks Service. "How to Flatten Folded or Rolled Paper Documents," NPS Conserve-O-Gram 13-2, 1993. <http://www.nps.gov/museum/publications/conserveogram/13-02.pdf>

Watkins, Stephanie. "Practical Considerations for Humidifying and Flattening Paper," The Book and Paper Group Annual Vol. 21, 2002. Pp. 61-76. <http://cool.conservation-us.org/coolaic/sg/bpg/annual/v21/bp21-15.pdf>

LIST OF SUPPLIERS

A list of suppliers is available on NEDCC's Delicious page: <http://www.delicious.com/nedcc/>

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