

## Dry Paper Pulping

### ABSTRACT

Paper conservators have had limited resources available when filling losses on moisture-sensitive papers or on paper supports that have water-soluble media. The author found that a dry pulp fill could be made from a pressure-cooked pulp and has developed a dry filling method using it. This dry pulp has excellent working properties: it is soft and absorbent while having manipulability and is the color of the source paper. It also has that characteristic which makes it possible for use as a fill material—compressibility. This article provides the recipe for manufacturing the pressure-cooked pulp; techniques for mixing and drying the dry pulp; and, finally, the preparation and application of the dry paper pulp.

### INTRODUCTION

Paper conservators have had limited resources available when filling losses on moisture-sensitive papers or on paper supports that have water-soluble media. In fact, there is little to choose besides time-consuming inserts.

While working with paper pulp made using a pressure cooker, the author found that a dry paper pulp could be made from the pressure-cooked pulp. The author has developed a dry pulping method using this pulp. This dry pulp has excellent working properties: it is soft and absorbent while having manipulability and is the color of the source paper. It also has that characteristic which makes it possible to use as a fill material—compressibility.

In the following, the author provides a recipe for manufacturing the pressure-cooked pulp; the mixing and drying techniques for those steps in the manufacture of the dry pulp; and, finally, the manufacture and application steps for the dry paper pulp.

### WET PAPER PULP MANUFACTURE USING A PRESSURE COOKER

Following are the basic steps for preparing a wet paper pulp in a pressure cooker (Hamm 2003).

#### Pressure-Cooker Paper Pulp

- 10-15 grams paper
- Tear and soak for 20–30 minutes in enough deionized water to cover paper
- Change water
- Cook paper pieces in 1 liter of water for 30 minutes
- Change water
- Place in pressure cooker with 1 liter of water
- Cook under 10 psi pressure for 20 minutes, following the pressure-cooker manufacturer's directions
- Cool for 20 minutes
- Run cool water over top of pressure cooker
- Divide pulp into two batches
- Add 500 ml of water to each batch
- Blend each for 2–5 minutes on medium in a standard blender

If a particularly heavy paper is used as the paper source, a second, twenty-minute pressure cooking session may be necessary with a blending session in between.

### DRYING THE PAPER PULP

Dilute the pressure-cooked pulp by adding 100 ml of water to 100 ml of pulp and pour the resulting pulp mixture onto a clean fiberglass window screen or other such support using clean canning rings as the form. It is not necessary to always use the canning ring forms, as the pulp can simply be poured out on the screen to form sheets of dried pulp, but it is easier to measure the pulp using the disks in order to reproduce a specific color of pulp.

When this pulp dries to a very thin paper film, the disks or sheets are removed carefully, as they are fragile. The

resulting thinner disks or sheets are ready to blend into the dry pulp. If sheets were formed, tear them into half-inch pieces.

#### MANUFACTURE OF DRY PULP

Place one disk or approximately two square inches of sheet pulp into a standard blender and blend for approximately five minutes, or until the disk has become a mass of finely dispersed fibers on the bottom of the blender container. Let the fibers settle to the bottom of the blender before opening the container, and then pour or shake them out of the blender container onto a dry paper towel. Gently gather the fiber mass into a loose ball. Do not compress more than is necessary to form the ball. The ball of dry pulp can be stored indefinitely in a lidded jar.

#### PREPARATION AND EXECUTION OF DRY PULPING METHOD

Losses in artwork can be filled from the back or front. Narrow cracks seen in some artworks are best filled from the front, obviously. The most precise fill for a loss is formed from the back. The authors prefer to work over a light box for pulp filling. A small sheet of non-woven polyester web should be placed beneath the artwork or below the loss to be filled. A small amount of methyl cellulose or dilute starch paste is dotted along the edge of the loss on the back using a fine brush. Fiber layers of dry pulp are peeled away from the pulp ball using tweezers. With the tweezers dry paper pulp is placed in the loss in thin layers: the first layer overlaps onto the edges of the loss where the adhesive has been placed. Between layers, the pulp is compressed with fingers using another small sheet of polyester web. Continue the fill until the thickness and density is acceptable. Follow with a cotton swab very slightly dampened in methyl cellulose; the authors use a 2% solution of methyl cellulose. Place another small sheet of polyester web on the filled loss followed by blotter, glass, and weights. Patching with Japanese tissue and starch paste on the verso over a small pulp fill or at the junction of the fill and the loss will secure it better, but it is not always necessary. When the patches are dry, turn over the artwork and apply methyl cellulose size to the front of the pulp fill in a similar manner, followed by a polyester sheet, blotter, glass, and weight.

The authors have experimented with some success using textured papers to impress a texture onto the pulp, as well as scoring with a pointed instrument over 1-mil Mylar to simulate laid lines. Inpainting with watercolor or other media is possible after sizing the front surface with methyl cellulose and drying it beneath polyester web, blotter, and weight.

Dry pulp fills are especially applicable for filling cracks or very small losses. Losses are filled much more quickly using the dry pulp than using the traditional wet techniques. The authors also have used the dry pulping to fill surface losses, such as those caused by silverfish. For filling cracks or surface losses, dilute adhesive should be brushed on the areas to receive the dry pulp to assure secure adhesion. Follow up by compressing the pulp fill, sizing with methyl cellulose, and applying polyester web, blotter, glass, and weight.

At least two colors of pulp are maintained in the authors' lab—dark and light. Mixes of the two pulps are made in the blender. Testing pulp color for matching is easy as the pulp is dry.

#### CONCLUSION

The use of a stable fill material, which is easily handled by the conservator, is a helpful treatment alternative for those problem losses found on many papers that are moisture sensitive or have water-soluble media. The use of dry paper pulp is faster than shaping inserts and allows the filling of very small losses, thin cracks, and surface losses.

#### REFERENCE

Hamm, Patricia. 2003. Second generation wet paper pulping. *The Book and Paper Group Annual 22*: 29–31.

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