



### Storage of Glass Plate Negatives

by

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#### *Historical Background*

The use of glass plate negatives began around 1851. The first glass plate negatives, commonly called “wet plate” negatives, used collodian, and were in use from 1851 until approximately 1880. To make a wet plate negative, a photographer coated a piece of glass with the emulsion and exposed it before it dried. This type of negative may be identified by looking at the edge of the emulsion, where the coating is often uneven.

The wet plate was replaced in approximately 1880 by the “dry plate,” which used a silver gelatin emulsion that was applied not by the photographer but by a manufacturer. The presensitized plates were sold and could be stored until needed. The processed emulsion on dry plate negatives is even, smooth and black.

Glass plate negatives were used in view cameras. In the hands of a skilled photographer, and because of the nature of the emulsions, they often contain a great deal of detail and subtlety of tone. Common negative sizes are 4 x 5, 5 x 8 and 8 x 10, although larger sizes are not uncommon.



#### *Enclosures, Shelving and Environment*

##### *Housing Undamaged Negatives*

The first enclosure that should go around a complete or unbroken glass plate negative is called a four-flap envelope. (See Figure 1.) The four-flap envelope is constructed so that the flaps overlay each other and cover the negative. This enables the negative to be put in and removed from the enclosure without scratching from sliding into and out of a regular negative envelope or sleeve.

The four-flap envelope should be made of acid-free, lignin-free heavyweight paper that has passed the Photo Activity Test (P.A.T.). This test was developed to ensure that material used to store photo images will be free of any component that might cause chemical reactions and damage the image. Check with the firm from which you purchase your supplies to make sure that *all* paper materials you use in storing negatives (prints and transparencies, too) have passed the P.A.T.

##### *Housing Broken Negatives*

The process is more involved for proper storage of broken glass plate negatives. To store a glass plate negative that has broken into two pieces, cut three pieces of 4-ply acid-free board to the same size as the negative (4 x 5, 5 x 7, 8 x 10, etc.). The mat support is made by placing one of the two fragments of the negative on one of the pieces of acid-free board. The negative is placed with the emulsion side up, so that it will not be scratched or damaged if moved. Trace the outline of the fragment onto the board. Using a mat knife or scalpel, cut the tracing from the board. The two pieces of board that result will be the shapes of both fragments.

Attach one of these pieces of cut board to one of the full-size boards. (Use a pH-neutral adhesive such as wheat starch paste or double-stick tape, e.g., 3M #415.) On that same full-size board, place the *other* negative fragment so that the broken edge of the fragment fits into the cut edge of the board (Figure 2). This is a version of what is commonly termed a “sink mat.” This is a mat on which the object, in this case a negative, sits level with or below the top surface of the mat. You then repeat the process with the second fragment. (See Figure 3 for an exploded-view drawing.)

Figure 1.  
This shows a broken glass plate negative in a four-flap envelope. On top is an outer envelope used in storing the four-fold envelope. Note the documentation on the outer envelope.



MHS photo by Eric Morenson

#### **Editor's note:**

Tech Talk is a bimonthly column offering technical assistance on management, preservation and conservation matters that affect historical societies and museums of all sizes and interests. Comments and suggestions for future topics are welcome.



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Figure 2. Two fragments of the same glass plate negative, shown in place on acid-free boards. The top one awaits a cut-to-size portion of the board, while the faint jagged line in the lower one shows where the cut board is placed.

MHS photo by Eric Mortenson

Sometimes you may have a negative with only a small piece broken off. A sink mat similar to the supports described above can be prepared that will support and entirely surround the pieces while separating them so that their edges do not touch and cause further damage. This same technique can be used for negatives broken into multiple fragments. The objective is to support and surround each piece so that additional damage does not occur from edges of the pieces rubbing against each other during retrieval, transport or refiling.

When the fragments are securely placed in the four-flap envelope, insert it into an acid-free envelope or sleeve. The outer envelope will hold the flaps closed and prevent them from catching on the flaps of other envelopes during filing or boxing. Since the negative is in the four-

flap within the outer envelope, the negative cannot be touched directly during retrieval, and there are few opportunities for the negative to slip out of the one open end of the outer envelope. (See Figure 1.)

The outer envelope is also the place to write the accession or inventory number, a brief identification of the subject of the image, and any other documentation you have about the image. Maintaining the data associated with an image is extremely important and increases the usefulness and value of any item in your collection.

### Boxing

The negative should now be put into a box or file drawer for storage. Glass plate negatives should always be stored on edge (Figure 4); flat storage would put items at the bottom of a pile under great risk of breakage from the weight of the negatives above it. Store glass plates in boxes with other negatives of the same size. Smaller negatives are not visible between larger negatives, making them hard to find and to retrieve. The box should be nearly full so that negatives stand straight up and are not under stress from leaning at an angle. If the box is not full, use a piece of acid-free board to form a spacer to hold the negatives in a vertical position. (Figure 5).

The boxes should be sturdy, with dimensions appropriate to the length and width of the negatives. The depth of the box is also an important consideration. Due to the weight of glass plate negatives, you should limit the number of negatives stored in a box. A box of 8 x 10 negatives, like the one holding 24 negatives shown in Figure 4, weighs approximately 16 pounds. An 8 x 10 x 5 box filled with sixty 5 x 8 negatives weighs more than 19 pounds.

### Shelving

There are several factors to consider when selecting shelving to hold your boxes of glass plate negatives. The first factor is the "load rating" for the shelving: It must not sag. Six boxes of glass plate negatives placed on one 36-inch wide shelf has a static load of approximately 100-115 pounds. Steel shelving can be purchased with different weight-bearing capacities for specific size and load requirements.

Another factor to consider is the material from which the shelving is made. For several reasons, steel shelving is preferable to wood. Wood, and the glue used to manufacture

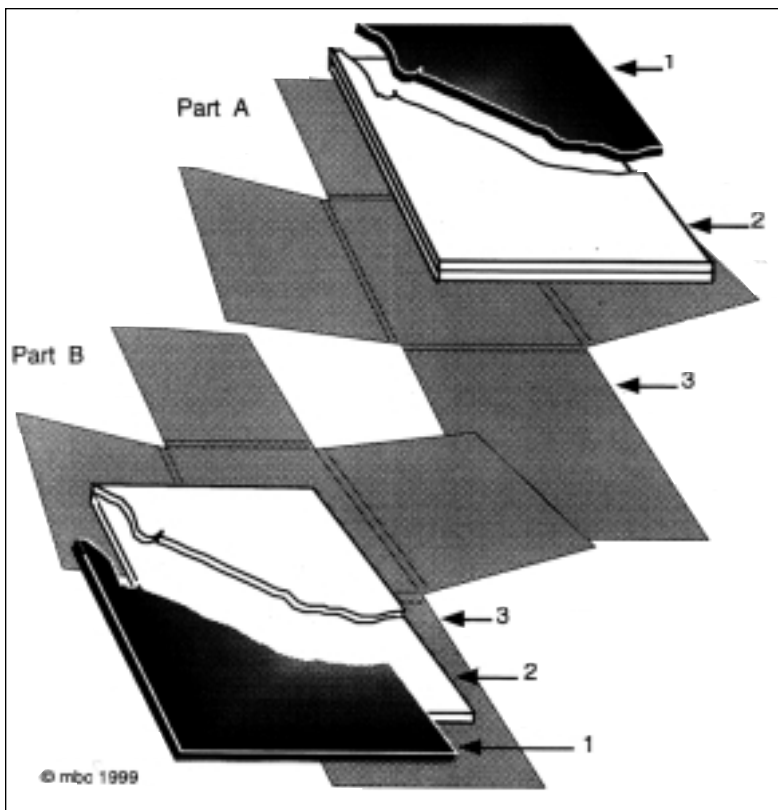


Figure 3. An exploded-view drawing of the two pieces of an 8 x 10 negative, the board supports, and the four-flap envelopes.

#### LEGEND

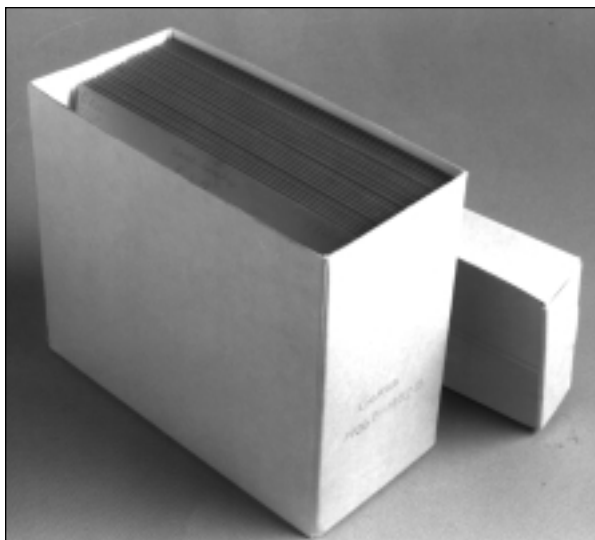
1. negative fragment;
2. acid-free board cut to conform to the shape of the broken edge, attached to a full-size sheet of acid-free board;
3. four-flap envelope.

Drawing by Mary Britton Clouse



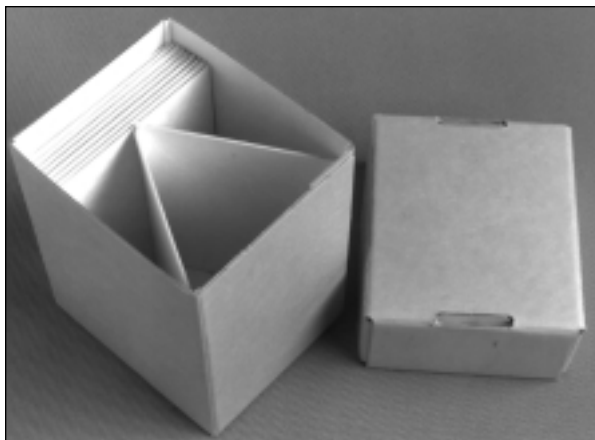
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Figure 4. An acid-free storage box for glass plate negatives. Note that they are placed vertically, and that there is identifying documentation on the outside of the box.



MHS photo by Eric Morenson

Figure 5. An acid-free storage box for glass plate negatives, showing the use of a piece of acid-free board as a spacer, because the box is not full.



MHS photo by Eric Morenson

wood shelving, will most likely emit or off-gas volatile organic compounds such as formaldehyde and acetic acid. These chemicals may be damaging to your photographs. Another factor is that plain wood shelving may not be sturdy enough for the weight of glass plate negatives. If you have four to six shelves in a shelving unit you may have nearly 700 pounds in that one unit. The unit must be sturdy enough not to sway or deflect under that load.

A third factor is the finish on your shelving unit. Any number of different types of finishes are applied to shelving units, which raises the issue of off-gassing. You want a finish that will be fully cured when you receive your shelving, one that will not off-gas anything that may be damaging to your collections. One class of finish currently used with metal shelving is called powder coat. Powder is sprayed on the metal, which has been charged with a slight electric current. The metal is then baked in an oven to cure the finish. This type of finish uses no solvents, so in addition to

being environmentally friendly, there are no solvents to off-gas during a curing period that might damage collection items.

There are other solvent-based finishes that are acceptable. Generally, they have a film-forming resin that is 100 percent acrylic or polyester, or a two-component epoxy. If you would like more detail about finishes, contact the Conservation Outreach Program (see address and numbers on p. 6) and ask for a paint specification sheet. This sheet has a list of eight questions and desired answers, which will assist you in establishing that your shelving has a finish that will not damage your collections.

One final point about shelving boxes of glass plate negatives: Do not place boxes too high or too low on shelves. These boxes are heavy and may pose a risk if they have to be retrieved or refilled from shelves that require an individual to stretch too high or pick up a heavy load from a low or awkward position.

## Environment

The temperature and humidity of the space in which you store your negatives will have a definite influence on how long they remain in their present condition. Cool temperatures will slow the rate of chemical reactions that cause deterioration of collections, but temperatures that are too low may make the glass or photo emulsion and binders brittle, and temperatures that are too high speed up those reactions. Similarly, relative humidity that is too high or too low increases the rate at which damage progresses.

An *ideal* storage temperature for photo negatives is less than 65 degrees Fahrenheit with minimal fluctuation ( $\pm 2$  degrees), and an *ideal* relative humidity is 30 percent RH with minimal fluctuation ( $\pm 3$  percent). These are ideal numbers, and people's storage situations are rarely ideal. In general, cooler and drier is better. When you need to make compromises in the storage environment, it is recommended that you compromise the set point first and try to create an environment with a minimum of fluctuation.

Much has been written about environmental controls for collections care. If you are interested in more detail, please refer to the additional readings listed below. They are available for loan at no charge to institutions in Minnesota from the MHS conservation outreach program.



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## Suppliers of Materials and Equipment

### Archival suppliers

**Conservation Resources International**  
8000-H Forbes Place, Springfield, VA 22151  
Phone: 1-800-634-6932; Fax: 703/321-0629  
E-mail: criusa@conservationresources.com  
www.conservationresources.com

**Gaylord Bros.**, Box 4901; Syracuse, NY 13221-4901  
Phone: 1-800-448-6160; Fax: 1-800-272-3412  
www.gaylord.com

**The Hollinger Corporation**, P.O. Box 8360  
Fredericksburg, VA 22404-8360  
Phone: 1-800-634-0491; Fax: 1-800-947-8814  
E-mail: hollingercorp@interserf.net

**Light Impressions**, 439 Monroe Avenue  
P.O. Box 940; Rochester, NY 14603-9952  
Phone: 1-800-828-6216; Fax: 1-800-828-5539  
www.lightimpressionsdirect.com

**Metal Edge, Inc.**, 6340 Bandini Blvd.  
Commerce, CA 90040  
Phone: 1-800-862-2228; Fax: 1-888-822-6937  
www.metaledgeinc.com

**Talas**, 568 Broadway; New York, NY 10012  
Phone: 212/219-0770; Fax: 212/219-0735  
E-mail: talas@sprynet.com

**University Products, Inc.**, 517 Main Street  
P.O. Box 101; Holyoke, MA 01041-0101  
Phone: 1-800-628-1912; Fax: 1-800-532-9281  
E-mail: info@universityproducts.com

### Shelving Manufacturers

**Borroughs Corporation**  
3002 North Burdick Street  
Kalamazoo, MI 49004-3483  
Phone: 1-800-748-0227; Fax 616/342-4161

**Edsal**  
4400 South Packers Ave.; Chicago, IL 60609  
Phone: 773/254-0600; Fax: 773/254-9690  
www.edsal.com

**Lyon Metal Products**  
P.O. Box 671  
Aurora, IL 60507  
Phone: 1-800-628-6489; Fax: 1-800-367-6681

**Rivetier**  
Fort Steuben Products, Inc.  
200 Fort Stueben Rd  
Weirton, WV 26062  
Phone: 304/748-6400

**Republic Storage Systems**  
1038 Belden Ave. NE  
Canton, OH 44705  
Phone: 1-800-477-1255; Fax: 330/454-7772

The above lists are not intended to be all-inclusive. They are provided for informational purposes by the Minnesota Historical Society. The Society does not endorse the products of any particular company and assumes no liability for the products sold by the firms listed.

## Additional Readings

Hendricks, Klaus B. "Care of Black-and-White Photographic Glass Plate Negatives," *CCI Notes*, 16/2, 1995.

Lull, William P. with Paul N. Banks. *Conservation Environment Guidelines for Libraries and Archives*. Ottawa, Canada: Canadian Council of Archives, 1995.

Thomson, Garry. *The Museum Environment*, 2nd ed. London: Butterworths, 1986.

Vogt-O'Connor, Diane. "Caring for Photographs: Special Formats." *Conserv O Gram*, Number 14/5. June 1997.

**Robert Herskovitz**, Chief Conservator for the Minnesota Historical Society, has been with the Society since 1987. He is managing the Society's new Conservation Outreach Program, and can be reached at 651/297-1867, or by e-mail at conservationhelp@mnhs.org. Mailing address: Minnesota Historical Society, 345 Kellogg Blvd. W., St. Paul, MN 55102-1906.

