Care and Storage of Photographs

APPLICABILITY
The handling and storage standards referenced in this seminar are for general household use only. They are not intended for institutional use or for large or valuable collections. In such cases, more rigid preservation standards, which ensure greater environmental controls, should be utilized.

ENVIRONMENT
Nothing affects photographic negatives and prints more than the environmental conditions in which they are stored. Store your photographs at a moderate temperature and relative humidity; no natural or fluorescent lighting should be used; clean air with good circulation and good housekeeping practices should be utilized. Keep them where you live; an interior room being the best. Avoid sources of light, heat, humidity and pollution. Don't store your collection in the garage, attic, or basement, near humidifiers, washers, dryers, or bathrooms (or in rooms directly below these).

Heat
Heat causes damage. Don't display or store your photographs over or near radiators, heat vents, the fireplace, or appliances that produce heat (and usually an oily discharge).

Light
Light is a photograph’s enemy; some types of light more than others. Store photos in the dark as much as possible; display photographs under subdued lighting. Never display a photograph where it will receive direct sun or fluorescent light, both of which produce ultra-violet rays that cause fading and damage. Hallways or other windowless rooms are best, but where you can not avoid windows, use blinds, shades, or heavy curtains to block the light. If you have photos displayed on the wall, try to rotate them to different locations throughout the year. When framing, the use of UV blocking glass will help protect a photograph, but is not a replacement for other preservation practices.

Water and Humidity
Water and high or low humidity can also destroy photographs. Low humidity may cause brittleness and cracking. If framed, photographs may stick to the glass in high humidity, where they may not be able to be removed without damage.

GENERAL HANDLING GUIDELINES
Limit handling of original material unless absolutely necessary. Handle photographs and negatives by the edges, wearing white cotton gloves. Residual oil from your fingers will eventually become a permanent mark. Never write on the front of a photograph. Consider writing identifying information on the enclosure rather than the photograph. If it is necessary to label a photograph, write gently at the bottom of the reverse using a #2 pencil. Some of the new resin-coated papers may require a #6B art pencil, available in art supply stores. Never use paper clips, staples, tapes, or rubber bands. Post-it notes leave a small adhesive residue that will eventually leave a mark on the photo.

If you plan to display a photograph (or any original document), it is always a good practice to make a copy of the original. Display the copy and keep the original in safe storage. Please remember that most studio photographs are copyright protected by the studio. However, most studios are willing to make an additional print for a nominal fee.

INTRODUCTION TO STORAGE PRINCIPLES
Photographs are unique in archival requirements since so much depends upon the original material and current condition. If you have an extensive collection in poor condition, valuable or rare examples of early photographic processes, you may wish to consult a professional conservator who has the expertise to evaluate your needs.

Photographs should be stored flat in an appropriate enclosure. These include envelopes, sleeves, albums and boxes manufactured to standards appropriate for the item being stored. These protect the collection from light, dust, pollution, rapid fluctuations in temperature and humidity, and handling.

The terms “archival” or “archival quality” are not technical terms. Utilized by most manufacturers, they can mean different things. Any storage devices used for photographic material should meet the Photographic Activity Test (PAT) standards, International Standards Organization (ISO) 18916 (ANSI/NAPM IT9.16). This is an accelerated aging test to determine that damage will not occur to photographs over long periods. Standards are regularly updated as new processes are developed. When purchasing storage material, you should purchase items that were intended for photographic storage. A box may be
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constructed to archival standards, but if intended to store documents, may not provide adequate protection for photographs. Even black and white photographs have different storage recommendations than color photographs.

Photographic materials from the last 100 years fit into a number of general categories: color prints, black and white prints, nitrate film, and cellulose acetate (often simply referred to as acetate) film. Slides and negatives are considered film.

**PAPER**

Paper quality is one of the most important things in determining suitability for use as archival storage. Poor quality paper may cause irreparable damage to photographs. Quality paper will free of acidic compounds and low in lignin levels. Since lignin can cause fading, staining or darkening of the paper, levels should be less than 1 percent. Paper has advantages and disadvantages as a storage media. On the one hand, paper provides protection from light; it is porous and allows harmful moisture and gases to escape; and it can be easily written on for notation or indexing purposes. However, the protective enclosure must be removed to view the photograph, increasing the chance of damage by mishandling or abrasive action.

**ACIDITY and ALKALINITY**

Acidity and alkalinity are measured on an algorithmic scale of pH, measured from 1 to 14, with 7 being neutral. A pH of 1 is extremely acid; 14 being highly basic (alkaline). Paper used in storing photographs should never have a pH lower than 7. A pH of 7.5 – 9.0, with a 2-3 percent reserve alkalinity (buffered) is generally preferred. However, some photographic processes (cyanotypes, dye-transfer prints, and blueprints) react badly to alkalinity, and you should use unbuffered paper with a pH of 7.0 – 7.5. Nitrates and cellulose acetates should be stored using buffered paper. Current ANSI standards call for black and white negatives and prints to be stored using buffered material; colored negatives and prints using unbuffered material.

**STORAGE PRODUCTS**

Paper enclosures are of three principle categories: envelopes, folders, and four-flap folding enclosures. Envelopes may have the top or top and side open; inert adhesive used on sealed edges. Four-flap enclosures and folders should be adhesive free. All are available buffered or unbuffered. Interleaving paper is smooth and soft, similar to tissue paper. It is used to interleave photographs that are not stored in individual enclosures. Commonly used between pages of an album, they protect the photographic surface against dust and abrasion. They may also provide some protection in an old acidic-paged album, in which the photographs cannot be removed and remounted. Hardboard can also be manufactured acid free and is commonly used in the manufacture of various storage boxes. Archival storage boxes are generally 40 – 60 mils thick. We prefer lift-off lids rather than hinged lids, since the hinged lids may eventually break. Boxes should be sturdy enough to support the weight of its contents; with reinforced corners. Mat board is used for mounting, matting, and framing photographs for display. Use a conservation board of cotton fiber or purified wood pulp. Mat board is available in a variety of thicknesses and colors; the larger the print the heavier the mat board should be in order to provide adequate support.

Glassine envelopes and sheets were once the standard for storing negatives and interleaving. However, it has fallen into disfavor as technology developed better methods and it is no longer recommended for photographic materials. Its properties change when used with buffered paper and it can absorb moisture and acids from the surrounding environment. Plastic enclosures are quite useful for storing items that are handled often. However, not all plastics are useful for archival storage, and they are difficult to visually differentiate. Plastics must be chemically stable with no surface coating or other additives. Many commercial plastics will break down under exposure to light and oxygen, producing chemicals damaging to photographic material. Plastics have the advantage that they allow the photograph to be viewed without removing the protective cover which should protect from handling, dust, moisture, and pollutants. They also use heat or ultrasonic seals, eliminating adhesive seams. It does not, of course, protect against light.

Three types of plastic currently meet acceptable standards for storage of photographic materials:

<table>
<thead>
<tr>
<th>Type</th>
<th>Support/Rigidity</th>
<th>Clarity</th>
<th>Abrasiveness</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyester</td>
<td>Excellent</td>
<td>Clear</td>
<td>Good</td>
<td>High</td>
</tr>
<tr>
<td>Polypropylene (untreated/uncoated)</td>
<td>Low</td>
<td>Clear</td>
<td>Good</td>
<td>Moderate</td>
</tr>
<tr>
<td>Polyethylene</td>
<td>Low</td>
<td>Translucent</td>
<td>Excellent</td>
<td>Low</td>
</tr>
</tbody>
</table>

CHART 1 – Characteristics of Archival Plastics
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Never use enclosures or sheets made of vinyl, PVC, or polyvinylchloride. Sometimes recognizable by its oily feeling and smell, polyvinylchloride is not acceptable for photographic storage since it produces a chemical reaction with photographs, causing damage and staining. Cellular triacetate should not be used as it can cause abrasion. Many older “magnetic albums” were of poor quality and utilized adhesives and plastics that can discolor photographs and make them difficult to remove without damage.

STORAGE CONDITIONS

Ideally, photographic materials should be stored in a cool, dark, dry location, protected from extreme fluctuations in temperature and humidity. In the home, an interior closet on a ground-level floor may be the best location to store your photographs. However, each location should be judged on its own merits. Most home collections will have to compromise on some requirements due to costs or other factors. In these, less than ideal conditions, it is even more important to utilize proper preservation techniques.

Since photographs and negatives are produced from such a wide variety of material, it is not possible to create a single standard suitable for all media. It can be equally difficult and expensive to meet all individual standards. To assist in the preservation of smaller collections, the Image Permanence Institute created a simplified version of their *Storage Guide for Acetate Film*, based on the recommendations of the International Standards Organization (ISO). Chart 2 represents the ISO and Simplified Version recommendations for maximum storage temperature for acetate film at the relative humidity (RH) listed:

<table>
<thead>
<tr>
<th>Media</th>
<th>ISO maximum temperature at maximum 40% RH</th>
<th>ISO maximum temperature at maximum 50% RH</th>
<th>Simplified maximum temperature at maximum 50% RH</th>
</tr>
</thead>
<tbody>
<tr>
<td>B&amp;W Film ①</td>
<td>Maximum temperature dependant upon maximum RH</td>
<td></td>
<td>40ºF (4ºC)</td>
</tr>
<tr>
<td>Color Film ①</td>
<td>Maximum temperature dependant upon maximum RH</td>
<td></td>
<td>40ºF (4ºC)</td>
</tr>
<tr>
<td>B&amp;W Prints</td>
<td>-</td>
<td>64ºF (18ºC)</td>
<td>54ºF (12ºC)</td>
</tr>
<tr>
<td>Color Prints ②</td>
<td>36ºF (2ºC)</td>
<td>27ºF (-3ºC)</td>
<td>40ºF (4ºC)</td>
</tr>
<tr>
<td>Optical Disks ③</td>
<td>-</td>
<td>70ºF (21ºC)</td>
<td>40-70ºF (4-21ºC)</td>
</tr>
</tbody>
</table>

*CHART 2 – Maximum Storage Temperatures for Acetate Film*

① Slides and negatives are considered to be Film, as are the various categories of motion picture film.
② No standards have been created for inkjet prints. Until specific standards have been approved, criteria for color prints should be used.
③ Disks should not be frozen as there are concerns about layer separation.

QUICK REFERENCE GUIDE

Chart 3 represents a composite reference for Home Storage of Photographic Materials based upon Photographic Activity Test (PAT) standards and the International Standards Organization (ISO) *Simplified Version Storage Guide for Acetate Film*. Institutions or holders of large or valuable collections should refer to the full ISO standards for storage of photographic materials.

<table>
<thead>
<tr>
<th>Photographic Media</th>
<th>Characteristics of Storage Media</th>
<th>Storage Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pH</td>
<td>Buffered Paper</td>
</tr>
<tr>
<td>B&amp;W Acetate Film ①</td>
<td>7.5-9.0</td>
<td>Yes</td>
</tr>
<tr>
<td>Color Acetate Film ①</td>
<td>7.5-9.0</td>
<td>No</td>
</tr>
<tr>
<td>B&amp;W Prints</td>
<td>7.5-9.0</td>
<td>Yes</td>
</tr>
<tr>
<td>Color Prints ②</td>
<td>7.5-9.0</td>
<td>No</td>
</tr>
<tr>
<td>Optical Disks ③</td>
<td>7.0-7.5</td>
<td>No</td>
</tr>
<tr>
<td>Cyanotypes</td>
<td>7.0-7.5</td>
<td>No</td>
</tr>
<tr>
<td>Dye-transfer Prints</td>
<td>7.0-7.5</td>
<td>No</td>
</tr>
<tr>
<td>Nitrate Film ④</td>
<td>7.0-7.5</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*CHART 3 – Quick Reference for Home Storage of Photographic Materials*

① Slides and negatives are considered to be Film, as are the various categories of motion picture film.
② No standards have been created for inkjet prints. Until specific standards have been approved, criteria for color prints should be used.
③ Disks should not be frozen as there are concerns about layer separation.
④ Nitrate film is highly flammable and may spontaneously combust. It deteriorates easily, producing flammable gas and oxygen.
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Examples of Archival Products

- Album w/reinforcement
- Hinged-lid Storage Box
- Drop Front Storage Box
- Folders
- Paper Envelopes & Sleeves
- Four-flap Enclosure
- Polyethylene Envelopes
- Mounting Corners
- Paper Negative Envelope

Resources

Light Impressions
P.O. Box 787
Brea, CA 92822-0787
800-828-6216
www.lightimpressionsdirect.com/

Metal Edge Inc.
6340 Bandini Ave
Commerce, Ca 90040
800-862-2228
www.metaledgeinc.com/

Gaylord Bros., Inc.
P.O. Box 4901
Syracuse, NY 13221-4901
800-448-6160
www.gaylord.com/

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