



# Conserve O Gram

September 1996

Number 19/15

## Storing Archival Paper-Based Materials

Significant portions of most archival and manuscript collections are typically made of paper. This *Conserve O Gram* provides basic guidelines for storing and preserving paper-based materials. See *Conserve O Gram* 19/16, Housing Archival Paper-Based Materials and *Conserve O Gram* 19/17, Handling Archival Documents and Manuscripts.

To Properly Store Your Archival Collections You Must Do This...	Don't Do This...
<p><b><i>Maintain a Proper Storage Environment</i></b></p> <ul style="list-style-type: none"> <li>• Keep documents in secure dark storage in a space that is clean, food-free, and has minimal fluctuation in temperature and humidity.</li> <li>• Maintain constant low temperature (e.g., 20°C [68°F] ±2°) and relative humidity (e.g., 45% RH ±2%) to avoid mold, acidic decomposition, and cockling.</li> <li>• Control light intensity, proximity, and duration, avoiding unnecessary light because this causes fading and/or darkening.</li> <li>• Use the time-based monitoring system to compare the various storage spaces you might select for archival collections. (See James Reilly citation in <i>References</i>.)</li> <li>• Leave at least 18" of space between the boxes on the top shelf and any light fixtures, pipes, or sprinkler heads.</li> <li>• House items in folders, within archival boxes, on shelves of inert material, such as fused, powder-coated steel shelves or mobile heavy-gauge chrome-plated steel wire shelving.</li> <li>• Avoid oak shelving which is highly acidic.</li> <li>• Avoid damage by keeping paper away from acidic plywood or pressed wood board, wood slats, and frames.</li> <li>• Use folders and mapcases to house oversize materials, such as blueprints, architectural drawings, and maps.</li> <li>• Clean the archival storage space using bench brushes to brush off boxes; brooms and vacuums to sweep; and occasionally, non-volatile cleaners, such as soap flakes in water, to mop the floor.</li> <li>• Wait until furniture and carpeting have stopped outgassing (6 months after installation) before moving collections into new storage spaces.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't expose documents in storage or on exhibition to:             <ul style="list-style-type: none"> <li>-light levels over 100 lux (10 footcandles) for light sensitive media, such as photographs and friable material</li> <li>-temperatures over 24°C (75°F)</li> <li>-humidity in excess of 60% RH</li> </ul> </li> <li>• Don't allow temperatures and humidity to fluctuate widely.</li> <li>• Don't use new furniture made of wood and wood composites, such as chip board, plywood, particle board, and masonite, because these materials may outgas fumes and/or may contain peroxide, formaldehyde, pitch, resin, and acidic lignin.</li> <li>• Don't use wooden file cabinets or rusting metal file cabinets which can damage archival materials.</li> <li>• Don't use harsh or strong cleaning chemicals, such as ammonia, bleach, peroxide, or anything that you can smell, for cleaning archival storage space.</li> </ul>

To Properly Store Your Archival Collections You Must Do This...	Don't Do This...
<p><b><i>Protect Materials from Light Damage</i></b></p> <ul style="list-style-type: none"> <li>• Keep all materials in housing, such as folders and boxes, when not in use.</li> <li>• Use ultraviolet (UV) filters on lights and windows in archival reference, work, storage, and exhibit areas.</li> <li>• Remember that light damage is cumulative and permanent.</li> <li>• Keep light levels between 50-100 lux (5-10 footcandles) in archival storage and exhibit areas.</li> <li>• Monitor changes in appearance in materials that are frequently exhibited, photocopied, or used in reference.</li> <li>• Watch for changes in color dyes over time due to light damage or yellowing of paper.</li> <li>• Produce copies for duplication and reference of all frequently-used or vulnerable materials.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't allow frequent exhibition, xerographic copying, photographic copying, or other exposure to light levels over 100 lux (10 footcandles).</li> <li>• Don't allow materials that may experience fading or color shift to be used extensively under high light levels.</li> </ul>
<p><b><i>Protect Materials from Mechanical and Structural Damage</i></b></p> <ul style="list-style-type: none"> <li>• Establish handling and use policies. Train staff and researchers in how to properly handle and house archival paper materials. See <i>Conserve O Gram 19/16, Housing Archival Paper-Based Materials</i> and <i>Conserve O Gram 19/17, Handling Archival Documents and Manuscripts</i>.</li> <li>• Watch for signs of damage in materials that indicate a need for improved environments, such as cockling, rust stains, detached spines, and tears.</li> <li>• Store collections at least 4"-6" off the floor.</li> <li>• Avoid using attics and basements as storage spaces.</li> <li>• Keep paper in protective microenvironments (boxes and folders).</li> <li>• Provide supports, such as folders, boxes, and carts, when moving paper collections.</li> <li>• Use a support when handling wet paper because it is vulnerable to damage.</li> <li>• Store materials in frames only when you are certain that framed items have archival-quality mat and back boards.</li> <li>• Always label boxes before placing them on shelves.</li> <li>• Place collections on shelves so that boxes are not crowded and hard to remove.</li> <li>• Add the needs of the archival collection into your Emergency Operation Plan.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't allow inappropriate attachments to paper materials, such as:                         <ul style="list-style-type: none"> <li>-paperclips</li> <li>-staples</li> <li>-Post-it notes</li> <li>-linen or pressure sensitive tape</li> <li>-plastic clips</li> </ul> </li> <li>• Don't fold, roll, or trim documents.</li> <li>• Don't attempt to mend ripped or torn items with any kind of tape, including <i>archival</i> or <i>conservation</i> tape.</li> <li>• Don't place fragile, heavy, or oversize items or boxes on top or bottom shelves because they are awkward to access and move and easy to drop.</li> <li>• Don't house archival materials in fire proof file cabinets because they take up excessive space and are too costly; instead, house in boxes on shelves.</li> </ul>

To Properly Store Your Archival Collections You Must Do This...	Don't Do This...
<p><b>Prevent Biological or Chemical Damage</b></p> <ul style="list-style-type: none"> <li>• Set up an Integrated Pest Management Program.</li> <li>• Watch for asbestos insulation or tiles, foxing, mold growth, insect or vermin accretions, and signs of humidity or microenvironment problems in storage spaces.</li> <li>• Monitor the environment 24 hours a day, 365 days a year to ensure that high temperatures (over 24°C [75°F]), high humidities (over 60% RH), poor air circulation, insects, vermin, mold, food preparation, and/or poor cleanliness are detected and corrected.</li> <li>• Install water alarms in spaces that are at risk of flooding; install fire alarms and sprinkler systems where there is a risk of fire.</li> <li>• Ensure that materials contaminated by mold, vermin, or insect damage, or that have other biological or chemical problems are stored apart from non-contaminated collections.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't use attics, basements, sheds, closets, garages, and environmentally uncontrolled spaces for archival storage.</li> <li>• Don't allow food, plants, pests, dust, and beverages in archival reference, storage, work, and exhibit spaces.</li> <li>• Don't store archival materials directly below water and sewage pipes or above active drains in case they leak.</li> </ul>
<p><b>Recover Materials from Biological or Chemical Damage</b></p> <ul style="list-style-type: none"> <li>• Work with a conservator to stabilize and preserve collections suffering from asbestos, mold, insect, or vermin contamination, either through cleaning, fumigation and/or freezing if necessary.</li> <li>• Wear appropriately-rated breathing apparatus, protective clothing, and latex gloves when working with contaminated materials.</li> <li>• Copy the materials after stabilization for use.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't work with contaminated materials without using appropriate protective devices and clothing.</li> </ul>
<p><b>Secure and Protect Collections</b></p> <ul style="list-style-type: none"> <li>• Establish guidelines for reference, handling, and reproduction of archival collections.</li> <li>• Enforce policies uniformly with all requestors, whether visitors or staff.</li> <li>• Ensure that staff and visitors use collections only with supervision.</li> <li>• Follow museum loan procedures for lending archival collections.</li> <li>• Ensure that archival collection storage spaces are protected by appropriate intrusion detection and fire detection and suppression systems. See NPS <i>Museum Handbook</i>, Part I, Chapter 9, Museum Collections Security and Fire Protection.</li> <li>• Ensure that spaces where archival collections are housed, processed, exhibited, or researched have fire and water alarms, sprinklers, and regular monitoring for leaks.</li> <li>• Ensure that the Emergency Operation Plan includes a list of collection salvage priorities.</li> <li>• Follow policies described in NPS <i>Museum Handbook</i>, Part II, Appendix D, Museum Archives and Manuscript Collections, Section U, for access and use restrictions.</li> </ul>	<ul style="list-style-type: none"> <li>• Don't allow researchers to work in archival storage spaces.</li> <li>• Don't allow staff or visitors to make xerographic or other copies of archival materials unless they are working with labeled copies, not originals.</li> <li>• Don't allow staff or visitors to bring coats, containers, packages, extensive files, or equipment into the reference room.</li> <li>• Don't allow archival collections to be borrowed or circulated like library materials.</li> <li>• Don't store archival collections on structurally-insecure shelving.</li> <li>• Don't use mobile shelving for magnetic media or glass plates, negatives, and transparencies.</li> </ul>

## References

Reilly, James. *New Tools for Preservation: Assessing Long-Term Environmental Effects on Library and Archives Collections*. Washington, DC: Commission on Preservation and Access, 1995. (Available from Commission on Preservation and Access, 1400 16th Street, NW, Suite 740, Washington, DC 20036-2217.)

Ogden, Sherelyn, "Storage Methods and Handling Practices," Northeast Document Conservation Center Technical Leaflet. Andover, MA: NEDCC, June 1994.

Ogden, Sherelyn, "Storage Furniture: A Brief Review of Current Options." Northeast Document Conservation Center Technical Leaflet. Andover, MA: NEDCC, June 1994.

Van der Reyden, Dianne. "Paper Documents," *Storage of Natural History Collections: A Preventive Conservation Approach*. Pittsburgh, PA: Society for the Preservation of Natural History Collections, 1995.

## Sources

See *NPS Tools of the Trade* (available only to NPS staff) for housing and interleaving materials and a list of vendors. Archival-quality materials can be purchased from suppliers, such as the following:

Conservation Resources International, 8000-H Forbes Place, Springfield, VA 22151; (800) 634-6932 or (703) 321-7730; Fax (703) 321-0629.

Gaylord Bros., Box 4901, Syracuse, NY 13221-4901; (800) 448-6160 or (315) 457-5070; Fax (800) 272-3412.

Light Impressions Corporation, 439 Monroe Avenue, P.O. Box 940, Rochester, NY 14603-0940; (800) 828-6216 or (716) 271-8960; Fax (716) 442-7318.

Metal Edge West, Inc., 2721 East 45th Street, Los Angeles, CA 90058; (800) 862-2228 or (213) 588-2228; Fax (213) 588-2150.

University Products, 517 Main Street, P.O. Box 101, Holyoke, MA 01041-0101; (800) 628-1912 or (413) 532-9431; Fax (800) 532-9281.

Diane Vogt-O'Connor  
Senior Archivist  
National Park Service  
Museum Management Program  
Washington, DC 20013-7127

Dianne van der Reyden  
Senior Paper Conservator  
Smithsonian Institution  
Conservation Analytical Laboratory  
Washington, DC 20560

---

The *Conserve O Gram* series is published as a reference on collections management and curatorial issues. Mention of a product, a manufacturer, or a supplier by name in this publication does not constitute an endorsement of that product or supplier by the National Park Service. Sources named are not all inclusive. It is suggested that readers also seek alternative product and vendor information in order to assess the full range of available supplies and equipment.

---

The series is distributed to all NPS units and is available to non-NPS institutions and interested individuals by subscription through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; FAX 202/512-2250. For further information and guidance concerning any of the topics or procedures addressed in the series, contact the NPS Museum Management Program, P.O. Box 37127, Washington, DC 20013-7127; 202/343-8142.