



MINNESOTA HISTORICAL SOCIETY

BUILDING A TIME CAPSULE GUIDELINES FOR PRESERVING MATERIALS

Time capsules and preservation are large and complex subjects. This page is meant to provide only an introduction to the subject.

Time Capsules May Not Be The Best Idea

An alternative to time capsules is archival storage of items in the home. With care, items can be preserved in home living areas and closets. Attics and basements may subject items to harmful extremes in temperature and humidity. Some experts think burial is a risky way to try to preserve items. Nevertheless, the process of choosing items to save in a time capsule can bring people together in positive ways, provide a valuable learning experience and demonstrate ways that items have meaning.

Many of the suggestions for time capsules below apply to other long-term storage as well.

Burial Can Be Risky

- 1) If you are going to place the capsule in the ground or in a building cornerstone, you must take added precautions for materials to last more than a generation.
 - Use an aluminum or stainless steel capsule housing. Various manufacturers and distributors make and sell these, including Future Archaeology (<http://www.futurearchaeology.com>) in New York City, University Products Inc. (<http://www.universityproducts.com>) in Holyoke, Mass.
 - Seal the lid and end caps. This is done best with a high quality two-part epoxy, which can be removed by cold methods such as mechanical reduction and solvents. (Do not weld or solder, because heat can damage the capsule and its contents during opening and closing.)
 - Seal the capsule inside a 6-mil (0.006 inch) polyethylene bag or wrapping to further protect against water infiltration. If buried, the capsule should be at least three feet below the surface to protect against wide fluctuations in temperature.

Not All Plastics Are Alike

- 2) Be certain that any plastic capsules or housing is made of pure polyethylene or polypropylene plastic. Do not use polyvinylchloride piping, because this material is chemically unstable and will damage most items placed in it in a relatively short time.

Preservation Tips

- 3) Don't let items that are not in individual bags or containers touch each other. This precaution prevents such problems as color transfer and the migration of acids from one item to another.
 - Place all organic (e.g. paper-based items) materials in 100-percent polyethylene bags (see archival supply distributor catalogs) or Mylar-D (pure polyester) film enclosures.
 - Place special buffered acid-free, lignin-free interleaving tissue between posters, maps and other flat items in the same enclosure.
 - Although buffered papers are better for most items, use unbuffered, acid-free, lignin-free papers and boards to separate black-and-white photographs and protein-based materials, such as leather. (Buffered papers are better for most long-term storage because acids can build up over time, even in acid-free paper. Buffers are added to paper to keep it acid free over time. These alkaline buffers, however, may harm some photographic images.)
 - Wrap textiles in Mylar-D and tie with neutral-colored cotton tape.
 - Avoid wool, silk and nylon fabrics, because they could break down, giving off sulphur or other harmful gasses.
 - Place crumpled pieces of unbuffered acid-free, lignin-free paper in the folds of folded clothing items to reduce sharp creasing and broken threads.
 - Place coins and other metal objects in a tarnish-reducing enclosure, such as bags made of Corrosion Intercept. Tarnish-inhibiting papers and cloths should be avoided because the inhibitors are volatile chemicals that may dissolve plastics and harm other materials in the capsule.
 - Photographs should be archivally processed black-and white prints on fiber-based papers. Use archival quality envelopes, such as MicroChamber or ArtCare. Place the photo image away from the envelope seam.

- Avoid placing newsprint in the capsule. Photocopy newspaper clippings onto archival quality (acid-free, lignin-free and buffered) paper and enclose them in Mylar-D envelopes. Do not laminate or dry-mount photographs.
- Place computer equipment and electronic data media in enclosures such as Corrosion Intercept or Static Intercept. Oxygen absorbers such as Ageless or RP may be used to further prevent oxidation of sensitive surfaces, available along with other supplies from Keepsafe Systems (<http://www.keepsafe.ca/>).
- Avoid storing food, even canned foodstuffs. Cans may explode from trapped gases emitted during microbial breakdown of the food and stain surrounding objects permanently. Freeze-dried foods sealed completely in impermeable packaging, such as MarvelSeal, are acceptable.
- Do not place loaded ammunition or other explosive materials or chemicals in the capsule. Unloaded weapons are acceptable, but be careful that lubricants do not seep out and stain other items.

Use Common Sense

- 4) Do not use pressure-sensitive tapes or adhesives of any kind for wrapping items or to seal envelopes.
- 5) Place the heaviest items on the bottom of the capsule housing.
- 6) Use only a soft pencil to label items. Ink will stain and change over time. Do not use colored inks or felt-tip markers. Do not use stick-on labels or place items with adhesives in the capsule.
- 7) Fill any empty spaces around the items with crumpled acid-free, lignin-free tissue paper to prevent shifting. Do not use polyurethane, Styrofoam, or other synthetic foam packing materials. Polyethylene foam such as Dow Ethafoam 220 or the equivalent is acceptable. Avoid the starch-based packing "peanuts" because they dissolve with moisture and are not manufactured for long-term use.
- 8) Condition the interior of the capsule to 20 percent to 25 percent relative humidity. Additional protection for especially moisture-sensitive objects, such as metal and electronic components, can be provided by desiccant silica gel in individual enclosures. Paper and other organic materials require a minimal level of moisture to avoid deteriorating and getting too brittle. Silica gel crystals in canisters or sheet form (ArtSorb panels) should be conditioned to 20 percent to 25 percent and sealed until ready for use, then placed inside the capsule housing immediately before sealing. In general, one ounce of gel should be used for every cubic foot of air inside the capsule, although the exact amount depends on the grade of silica gel.

You can get further information about time capsules at the web addresses listed below:

http://www.museumonmainstreet.org/exhibs_yesterdays/yesterdays_resources.htm

http://www.oglethorpe.edu/about_us/crypt_of_civilization/international_time_capsul_society.asp

http://www.cci-icc.gc.ca/document-manager/view-document_e.cfm?Document_ID=141&ref=c

<http://www.futurepkg.com>

The Minnesota Historical Society's Conservation Department Outreach office can also be contacted for further information at 651-259-3388.

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This information is provided as general guidelines for time-capsule construction. Neither the author nor the Minnesota Historical Society endorses any of these products nor accepts responsibility or liability for any of the listed products or advice and their application by the reader. Each application must be evaluated individually, and materials and techniques selected that best suit the condition of objects and how they are to be preserved.