



Recommendations for Maximizing Long-Term Sustainability In Selection of Time Capsule Contents

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Passed by the 114th Congress in 2016, the Act to Establish the Semiquincentennial Commission describes a time capsule to be installed at Independence Hall in Philadelphia, on July 4, 2026, which will contain “a representative portion of all books, manuscripts, miscellaneous printed matter, memorabilia, relics, and other materials relating to the United States Semiquincentennial.” In support of this effort, the Library of Congress was asked to offer technical guidance for the long-term sustainability of items to be included in the capsule. In addition to recommendations for materials to be used, this document will also identify materials to be avoided owing to higher risks of degradation and their detrimental effects on other items sealed inside the capsule.

Suggestions for media and formats

Different media formats have their own unique preservation concerns. Two materials that pose particularly low risk for degradation are **engraved metal** and **permanent, or archival, paper**.

- The most long-lived material is engraved, nonreactive metal, such as stainless steel or titanium.
- The composition of paper can vary widely. All documents would be recommended to be printed on permanent (often called archival) paper. Archival paper is an especially permanent, durable acid-free paper. Archival paper is recommended for publications of high legal, historical, or significant value. It is well suited to the long-term preservation of contents in a time capsule.
- Standards for permanent paper may be found here:
 - [ANSI/NISO Z39.48-1992](#) (Permanence of Paper) is a standard for paper that meets the criteria for permanence.
 - [ISO 9706](#) (Information and documentation – Paper for documents – Requirements for permanence) is a similar standard for permanent paper.

- Two approaches to limiting the contents of the time capsule to permanent, or archival, paper may be used:
 - Ask all contributing institutions to submit high-resolution files to a central location to be printed on known permanent, or archival, paper; or
 - Provide archival paper to all of those institutions providing materials to be contained within the time capsule.

Not recommended

Mixed media contents, such as paper and plastic together, need to be carefully considered and *are not recommended* as appropriate materials for long-term sustainability of items to be enclosed in the time capsule. In a sealed environment, the long-term atmosphere can be affected by some objects over time, as less stable materials can release compounds harmful to long-term preservation. These compounds, sealed within the capsule with no escape, could accelerate the degradation of other collected items.

To be avoided

To be particularly avoided are organic materials as well as inorganic materials such as plastics and reactive metals that can degrade. Past time capsules have contained plant and other organic materials, which can release compounds as well as break down and cause damage to other items in the capsule. Any inorganics such as reactive metals with potential to rust also can cause damage, particularly when in contact or proximity to other materials, e.g., no staples in paper documents.

Time Capsule design by engineers from the National Institute of Standards and Technology with support from the Library of Congress.

Time Capsule Vessel (measurements approximate)

