

The Care and Preservation of

Glass & Ceramics

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Glass and ceramic objects can be maintained for years of use and enjoyment provided that some basic care and attention is given to their preservation. The conservation staff at the The Henry Ford have compiled the information in this fact sheet to help individuals care for their objects and collections. The first step in the care of collections is to understand and minimize or eliminate conditions that can cause damage. The second step is to follow basic guidelines for care, handling and cleaning.

CAUSES OF DAMAGE

Glass and ceramics are among the most durable antique collectibles. Breakage is by far the most common form of damage that occurs to both. Additional damage in the form of stains and discoloration can be caused by improper use, display, cleaning or repair. In rare instances, poor manufacture or harsh environmental conditions lead to degradation.

CERAMICS

Ceramics can become permanently stained by a variety of factors including inappropriate cleaning, repairs or careless use.

Porous, unglazed or cracked ceramics can develop stains as a result of being soaked in water during cleaning. The absorption of colored materials such as foodstuffs, soil from potted plants or rust from contact with metal objects can also cause staining. In addition, the use of inappropriate or poor quality adhesives and paints during the restoration process can also result in irreversible discoloration.

Antique ceramic dishes and bowls should never be heated beyond room temperature. Elevated temperatures can cause darkening of already existing stains and sudden changes in temperature can promote the development of cracks.

In the case of archaeological ceramics, damage can be caused by the presence of salts that have been absorbed into the object from the soil in which it was buried. These salts can absorb moisture from the air when humidity levels are high. This absorption of moisture causes the expansion of the salts which can lead to cracking or delamination

of the ceramic object. The primary method for preserving archaeological ceramics is to provide a stable environment.

GLASS

In rare instances, a damaging condition called "weeping glass" occurs. "Weeping glass" manifests itself in the form of droplets of moisture that form on the surface of a glass object. These droplets of moisture can actually leach out unstable components of the glass producing an alkaline solution. If these alkaline droplets remain on the surface of the glass for a long period of time the surface will develop a fine network of cracks. This phenomena is referred to as "crizzling". Both crizzling and weeping are believed to be the result of improper formulation during glass manufacture.

Glass can also be permanently damaged by lengthy exposure to acidic or alkaline conditions such as in the case of archaeological glass. Glass that has been buried in the soil for long periods of time develops a matte, scaly and "iridescent surface". In the case of archaeological antiques, the iridescent scaly surface has become a prized aesthetic quality that is actually desirable for collectors of archaeological glass.

The primary method for stabilizing damaged glass is to provide a stable environment.

GUIDELINES FOR CARE

HANDLING

The primary cause of damage to both glass and ceramic objects is mishandling. Careless handling can result in breakage, chips and scratches that mar the beauty of glass and ceramic antiques.

The careful handling and storage of glass and ceramic objects is the surest way to provide protection. Always use two hands when lifting or moving objects, being careful to lift them from their strongest points. Never lift objects by their handles or spout. This is particularly important in the case of objects that have been repaired previously. Even the best repairs cannot completely restore the structural strength to a broken glass or ceramic item.

Whenever possible, stacked items should be cushioned using felt, soft cloth, or polyester padding to avoid abrasion of decorative surface elements. Care should also be taken to avoid rubbing gilded or iridescent glass surfaces since they can be easily worn off.

DISPLAY

The use of spring-type metal plate hangers should be avoided. These hangers place a great deal of stress on objects and can lead to the development of cracks. Metal hangers can also scratch the surface of the object. Plate stands constructed of hard plastic or painted wood that allow the object to rest at a tilted angle are preferable (these stands are available at Michael's Crafts and Pier I Imports).

CLEANING CERAMICS

Although ceramics are generally considered to be stable materials, a certain amount of caution must be used when cleaning them. Archaeological and low-fired porous ceramics should only be cleaned by a trained conservator. The majority of ceramic items however, can be successfully cleaned provided that a few basic instructions are followed.

Some antique ceramics contain fragile painted or gilded surface decoration which can be removed or damaged by harsh cleaning solutions. It is important to use only dilute cleaning solutions, applied with soft cloths during cleaning. Antique ceramics should never be soaked in any liquid. Prolonged soaking and uneven drying can lead to staining of ceramics. This is particularly probable in items that are chipped, scratched or that have cracked glazes. Lastly, automatic dishwashers should never be used to clean antique ceramics.

Recommended materials for cleaning ceramic objects include mild detergents in water. The detergents most commonly used here at the Henry Ford Museum are Triton X-100, Vulpex and Orvus. All three products are available from Conservation Resources International L.L.C. (see Suppliers list below). A mixture of ethanol (ethyl alcohol) and water 1:1 can also be used for cleaning.

Before proceeding to clean an object, it is important to inspect and test the object to make sure that no elements will be removed or damaged during cleaning. Examine the object to determine if there is any flaking gilding or paint that could be wiped away during cleaning. Once it has been determined that it is safe to proceed with cleaning, the cleaning solution should be tested in a small inconspicuous area to insure that decorative designs will not be damaged.

Dilute detergents (approximately 1% in water) should be applied using a soft cloth or cotton balls. The residual detergent should be removed by rinsing with distilled water applied also with a cloth or cotton balls. In both instances, the cloth should be damp not wet. The object should then be allowed to air dry.

Additional cleaning involving the removal of tenacious stains and dirt should be left to a professional conservator.

CLEANING GLASS

Glass can be cleaned in much the same manner as ceramics...with the addition of dilute ammonia as a cleaner. "Weeping" glass and archaeological glass should only be cleaned by a professional conservator.

CERAMIC REPAIR

Choosing an adhesive for a ceramic object is not always a simple task since it depends on the porosity and overall condition of the object. A poor choice can result in irreparable staining. As such, it is recommended that a conservator be consulted.

GLASS REPAIR

Archaeological glass, painted glass and glass photographs can be easily damaged by inappropriate repairs and, therefore, should be repaired only by professional conservator.

The majority of other types of glass objects can be safely repaired in the following manner:

The most commonly used adhesive for the repair of glass objects is epoxy. The adhesive used most often at the Henry Ford Museum is Hxtal (available from Conservation Resources International L.L.C. - see Supplier list below). Hxtal is a strong clear adhesive that is relatively light stable. The major disadvantage to using epoxies is that they discolor with time and exposure to light. Hxtal is one of the most stable epoxies that is currently available. Many commercially available epoxies discolor within a short period of time resulting in unsightly repairs.

When repairing a broken glass object, care should be taken to avoid abrading broken edges while trying to align them. Abraded edges will prevent proper alignment during repair. Once the adhesive has been applied to all broken edges the pieces should be aligned and secured until the adhesive sets. Clear adhesive tape or strapping tape works well to hold fragments together as the adhesive cures. Residual adhesive should be removed prior to curing using acetone that is applied with a soft rag or cotton swabs.

The adhesive should be allowed to set for at least 72 hours prior to removal of the adhesive tape.

Once a glass object has been repaired using epoxy, it should be kept out of direct sunlight. Sunlight will accelerate the yellowing of the adhesive. Although epoxy is a strong adhesive it may not withstand prolonged soaking. The object should not be soaked in liquids as they may loosen the mended area.

ENVIRONMENT

It is preferable to store damaged and unstable antiques such as archaeological objects and "weeping glass" in areas where temperature and humidity levels can be controlled and monitored. The recommended temperature and humidity levels are as follows:

Weeping Glass	Temperature Relative Humidity	65-70 F 40%
Crizzling Glass	Temperature Relative Humidity	65-70 F 55%
Archaeological Ceramics	Temperature Relative Humidity	65-70 F 45%

* It is critical to avoid fluctuations

While precise control of temperature and humidity is desirable, it is not always practical in homes. Therefore, damage should be minimized by avoiding extremes in temperature and humidity. This can be done by insuring that objects are kept away from heat sources such as furnace vents, fire places, warm lights, direct sunlight, and internally lit display cases. Inexpensive temperature and humidity indicators can be purchased from conservation suppliers.

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Penguin Books Ltd.
536 Kings Rd
London SW100UH

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Susan Buys, Victoria Oakley
Butterworth-Heinemann
London

ICC CCI Notes
Canadian Conservation Institute Notes
The Care of Ceramics and Glass 5/1
1030 Innes
Ottawa, Canada
K1A 0C8
613-998-3721

Brill, R. "Crizzling-A Problem in Glass Conservation," Conservation in archaeology and the applied arts. International Institute for Conservation (1975) 121-134

Lins, P. Andrew. "Ceramic and Glass Conservation: Preventive Measures", Museum News. 55, No. 3 (1977): 5-9

Rottenberg, Barbara Long. Care and Display of Glass Collections. American Association for State and Local History, Technical Leaflet 127, 1980

SUPPLIERS

Conservation Resources International L.L.C.

8000-H Forbes Place
Springfield, VA 22151
1-800-634-6932
Fax: 703-321-0629
Vulpex and Orvus Detergents, Hxtal Epoxy

University Products

517 Main Street
PO Box 101
Holyoke, MA
1-800-762-1165
Humidity indicators

Hardware stores

Acetone and Ethanol (ethyl alcohol)

Michael's Crafts and Pier I Imports

Plate stands



REFERENCES

For a listing of conservators in your area, please contact:

The American Institute for Conservation of Historic & Artistic Works
1717 K Street NW
Suite 301
Washington, DC 20006
202-452-9545
<http://aic.stanford.edu/guide/form.html>

Note: The in-house conservation staff at The Henry Ford has developed these Preservation Fact Sheets to assist in caring for your historical materials. These fact sheets provide basic information on the care, cleaning, and handling of a particular type of artifact, referral information to other conservation organizations, and a bibliography of authoritative works. Individuals may also arrange for a private consultation with a conservator. For more information, please contact the Benson Ford Research Center at research.center@thehenryford.com.

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