



SAVING YOUR Treasures

A Website about what you can do to protect and preserve the things of importance in your life



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CARING FOR COPPER ALLOYS

In the course of caring for copper alloy objects on display, it sometimes becomes necessary to do more than simply provide preventive care measures. Objects that have been damaged, mishandled, or have become tarnished often do not accurately reflect the appearance originally intended by the artist or maker. Procedures discussed in this handout are for historic and decorative arts objects only. They are not appropriate for ethnographic or archeological materials.

While the procedures listed below are sometimes necessary, they should not be undertaken lightly, because permanent damage to an object could result from their misapplication. Consult a conservator in order to assess all the issues relating to the care of the specific object in question.

Examine the Object:

The structural integrity of the object is of paramount importance due to the amount of handling required by these procedures. Examine the structure carefully, looking for cracks, weak areas, old repairs, and loose or missing parts. Once you have thoroughly examined the structural condition, consider the surface of the object.

When examining the surface it is important to determine if there is an original organic surface coating. In some cases, this is simple. Paint, for example is a readily apparent decorative and protective coating material. Other coatings, however, may not be so easily seen. Transparent organic coatings like shellac were sometimes applied to copper alloy surfaces as part of the manufacturing process. These coatings were employed both to prevent surface oxidation and to provide a golden appearance. Inadvertent removal of such a coating would permanently diminish the object. These transparent coatings are often visible under long wave ultra-violet light illumination. If they are failing and lifting from the surface, they may be visible with a stereomicroscope or a strong hand lens.

Another important type of decorative and protective surface often applied to copper alloy objects is patina. A patina is a thin chemically induced layer of relatively stable corrosion on the surface of an object. While patinas can form naturally over time, they are often intentionally created as a part of the finishing process. Patinas can be created in a number of colors, but shades of brown, gray, black, or blue/green are predominant. Patinated surfaces are sometimes enhanced and further protected with a thin coat of clear or pigmented wax.

Sometimes, copper alloy objects are disfigured with spotty, uneven, or blotchy blue/green corrosion products. These corrosion products cannot be easily reduced or removed in a museum, historic house, or home setting. If your object has this problem, or if you are uncertain about its appearance or features, consult a Conservator for guidance on proper care.

If the artifact is determined to be structurally sound, it has no evidence of original organic or inorganic surface coatings, and has only minor superficial soil and/or tarnish, proceed with caution. Materials and techniques used should be extremely gentle to avoid causing unnecessary deterioration. Avoid the use of commercial polishes, as many contain corrosive chemicals such as ammonia or harsh abrasives that can permanently damage delicate surfaces. They often also contain corrosion inhibitors that, while useful on household items that are currently in use, can cause unusual or tenacious re-corrosion in a display setting. The materials and techniques listed below have been tested by conservators and found to be safe and effective when used in a careful and sensitive manner.

Preparation:

Provide a clean, well-ventilated work area for the cleaning process, including a large padded worktable, adequate light, and sufficient ventilation to remove solvent vapors. Place a clean piece of cotton flannel, soft muslin or other soft cotton on the table as a work surface. Wear protective latex or nitrile gloves to avoid contaminating both the object and your hands. Wear a clean cotton smock or apron to protect your clothing. To the extent possible, disassemble the artifact. Take digital images and notes to be certain that parts can be reassembled correctly. Use thin sheets of clear polyethylene to mask out any nonmetallic elements such as wooden or ivory handles to protect them during cleaning.

Materials to Have on Hand:

- Clean cotton padding placed over a stable work surface
- Cotton swabs or pads, as needed
- Gloves: latex or nitrile
- Mineral spirits
- Precipitated calcium carbonate
- Mild detergent solution composed of a few drops of clear dishwashing liquid in distilled water
- Soft clean natural bristle brushes, such as haké, watch, or paint brushes
- Apron or smock to protect clothing
- Clear microcrystalline paste wax, such as Renaissance® wax, or a clear hard paste wax available in hardware stores such as Butcher's® wax or Behlens® paste wax.
- Clean natural bristle stippling or stencil brushes, or shoe buffing brushes, for waxing and buffing

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Clean the Surface:

Remove any loose dirt or dust by dusting lightly with a soft brush. Haké brushes are good choices for dusting because they are made entirely of wood or bamboo. If a soft artist's brush is used, cover the metal ferrule with tape to avoid scratching the artifact. Do not use dusting cloths as they will not reach into small crevices, and can scratch objects if trapped grit is rubbed over surfaces. Stiffer brushes may be needed on badly corroded items. Be very careful not to scratch the surface of your object.

Old polish residues trapped in recessed areas are a common problem found when cleaning historic copper alloy objects. Many commercial polishes contain waxy components that cause the abrasives to stick to the surface. These can usually be removed by applying a few drops of dilute detergent solution (a few drops of clear, unscented dishwashing liquid in distilled water) with a soft brush or cotton swabs. A small amount of waiting time may help facilitate removal. Gently agitate with a soft sable paintbrush to help loosen embedded material, and then rinse thoroughly with clean cotton swabs dampened in distilled water. Remove any waxy or oily accretions by moistening a cotton pad or a wad of loose cotton with mineral spirits and wiping the surface. If wax is trapped in candle cups or depressions, saturate a small wad of cotton with mineral spirits and place it on the wax for a short period to soften. Once the wax is soft, push it off with the blunt end of a bamboo skewer and remove any residue with cotton dampened with clean mineral spirits. Avoid scratching the surface with old polish and accumulated grime by using the lightest functional working pressure. Change swabs often to reduce risk and use a rolling rather than rubbing motion. Work in a well-ventilated area when using solvents.

Small copper alloy objects sometimes have iron wires rolled into the rims or edges to increase their structural rigidity. Do not wet these areas with water under any circumstance. Do not allow liquids to penetrate hollow handles or other hollow parts that are difficult to rinse or dry. Never immerse the object in a bath of water.

In many cases, the cleaning actions listed above will be enough to remove light tarnish and fingerprints from the surface. Because many copper alloy objects are not meant to be bright and shiny, it is best to avoid polishing them. Wipe the object gently with pieces of clean flannel or loose cotton, changing them frequently to prevent surface abrasion. Allow the object to dry completely in a warm, dust free environment.

Apply a Protective Coating:

To protect the object from water and air born pollutants, apply a small amount of microcrystalline paste wax to a soft clean dry cloth or very soft brush and rub it over the entire surface of the object, being careful to get complete coverage. Do not apply too much wax; only a small amount is needed. Wait a moment and buff the wax out with clean pieces of old silk, clean old nylon stockings, or soft brushes. Wax has a flat plate-like structure and buffing helps align and compress the plates for a more complete and protective coating. If you accidentally leave unbuffed wax on the surface too long, apply a small amount of fresh wax to soften the dried wax and buff immediately.

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To maintain the wax coating, periodically dust the object with a soft natural bristle brush and check for evidence of discoloration. The wax should provide good protection for at least a year, depending on the environmental conditions. If the item must be handled, wear clean latex, cotton, or nitrile gloves. For objects on permanent display, consider having a conservator professionally clean the object and apply a stable organic resin coating. This durable and protective coating can provide up to twenty years of protection and minimizes the wear and tear associated with repeated handling.

WARNING: When working with solvents, always follow all recommended safety precautions noted on the containers. Mineral spirits are strong, reactive chemicals, and their fumes are harmful to your health if not used as instructed. **Always be aware of the location of the nearest fire extinguisher when working with flammable solvents and waxes.**

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