

Clocks

By Mary M. Fahey, Chief Conservator, The Henry Ford

Historic clocks 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 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, maintenance and handling.

CAUSES OF DAMAGE

Included among the factors that can cause damage to clocks are careless handling, improper cleaning and repair, over-winding, and storage or display in a poor environment. Poor environments include areas where there is high and/or fluctuating humidity or temperature, excessive exposure to light, pests or pollution.

ENVIRONMENT

TEMPERATURE AND HUMIDITY

Wood Cases - Since wood is a porous material, it readily absorbs water when humidity levels are high. This absorption of moisture causes the swelling of wood. Conversely, wood shrinks in a dry environment. The shrinkage of wood in dry environments leads to the formation of structural cracks, lifting veneer and inlays, gaps in joints and the embrittlement of adhesives. Fluctuations in humidity and temperature levels result in similar damage. 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 wooden clocks are kept away from heat sources such as furnace vents, fire places, warm lights and direct sunlight.

The recommended temperature and humidity levels for the storage and display of wooden clocks are as follows:

WINTER

Temperature 70 degrees F
Relative humidity 35%-50%

SUMMER

Temperature 70-75 degrees F
Relative humidity 40-60%



Inexpensive humidity sensors can be purchased from conservation suppliers.

Metal Clock Cases - The greatest cause of damage to metal is corrosion. Corrosion is brought on by the presence of pollution or salts such as those present in the oil of human hands. Salts and pollution in combination with moisture can produce corrosion.

When dust is allowed to accumulate on the surface of a metal object it attracts moisture thus increasing the rate at which corrosion formation occurs. Keeping metal objects clean and free of dust can reduce this problem.

In general maintaining low humidity levels in areas where metal objects are stored or displayed can effectively slow down the rate of corrosion formation. The recommended temperature and humidity levels for metals are 68 o F at 30% Rh.

However, clocks that are constructed of a variety of materials such as wood, ivory or tortoiseshell should be kept under the slightly higher humidity levels recommended for wood clock cases.

Painted Metal Clock Faces - In environments where humidity levels are high, corrosion can form between the paint layer and its metal support. When corrosion develops underneath a paint layer, it can actually push the paint off the surface of the clock face. Again, the best way to prevent this damage is by providing a stable and moderate humidity level for the clock.

LIGHT LEVELS

Wood finishes, stains and some paints are susceptible to darkening and fading from exposure to high light levels. For this reason painted or varnished wood clocks should be exhibited and stored in an area where bright light is not allowed to fall on them. Excessive light can also accelerate the aging and degradation of finishes resulting in a cracked, brittle and/or "alligatored" appearance.

Heat generated from high light levels can also be a factor in causing damage to finishes. Some varnishes can become soft and sticky when temperatures are high. Soft finishes attract dirt easily and can become stuck to surfaces when left in contact for extended periods of time.

PEST DAMAGE

A variety of pests can cause damage to clocks. These include carpet beetles and powder post beetles.

Carpet beetles generally subsist on protein-based materials that are often present as adhesives. Carpet beetles are generally found at joinery and inside clock cases. The presence of tiny black beetles (2mm in size), small worms or furry carcasses are an indication of infestation.

Powder post beetles characteristically bore small holes (approx. 2 mm in diameter) into wooden materials. These holes are generally the first visible evidence of infestation. Wooden objects should be routinely moved and examined for infestation. The underside of legs and drawers should be inspected since insects generally hide in inconspicuous, dark places.

If evidence of infestation is found, the object should be placed in a plastic bag and isolated until it can be examined by a professional conservator.

A concise reference and descriptions of wood pests are included in "The Guide to Museum Pest Control" by Zycherman and Schrock.

HANDLING

When moving clocks, care should be taken, by the individual, to remove accessories or articles of clothing such as belt buckles and jewelry that can scratch the surface of the clock. An antique clock should always be grasped at its most sturdy area. The clock should never be grasped by its handle as the attachments may have weakened with age and use. Tall case clocks should be disassembled and lifted by two people while being moved. Never drag antique clocks. Dragging can place stress on the legs and feet of the clock.

Spring-driven clocks can be moved without much disassembly. The pendulum should always be secured to prevent damage. Some clocks are equipped with an internal latch that is intended to secure the pendulum during movement. An alternative method is to place foam or padding behind the pendulum to secure it into place. The clock should then be tilted onto its back during movement. (See diagrams and further instructions for pendulum removal in The National Trust Manual of Housekeeping.)

When moving weight-driven clocks, it is advisable to wait until the clock has wound down before it is relocated. Once it has stopped running, carefully remove the weights and pendulum.

Touching metal surfaces with bare hands should be avoided since the oils and salts from hands can lead to corrosion. It is advisable to wear cotton or rubber gloves when handling the metal portions of the clock.

WINDING AND SETTING

Be sure to avoid over-winding clocks. It is helpful to wind clocks at the same time each week (or day for 30 hour clocks) in order to prevent over-winding.

When winding, hold the clock with one hand so that it does not slip or move. Clock hands should always be adjusted by moving them in a clockwise direction.

CLEANING AND MAINTENANCE

There are many commercial cleaners and polishes available for the care of antiques. While some of these products may be genuinely safe to use on antiques, it is difficult to assess the long-term effect of these products. Manufacturers generally guard their "ever-changing" formulas; thus it is difficult to recommend any specific commercial product.

Many popular wood cleaning formulations contain tung, walnut, linseed or silicone oils which have been proven to age poorly. Products of this type should be avoided since they can actually darken or become opaque with age, resulting in a dark, dull and often irreparable finish.

CLOCK MOVEMENT

Clocks mechanisms should be inspected, cleaned and oiled by a professional once every five years. A routine inspection should include checking for worn or broken parts, fatigued springs and accumulations of dirt or oil.

Only high quality oils such as La Perle Clock Oil should be used when lubricating clock movements. Poor-quality oil can become sticky leading to mechanical problems.

METAL HARDWARE

Since metal polishes can abrade and damage the surface of painted and varnished wood, all metal hardware such as knobs, hinges and handles should be removed from the clock for cleaning.

Hardware that still maintains its original lacquer coating should not be polished. If unlaquered hardware is slightly tarnished and dirty, it should be cleaned using mineral spirits applied with cotton swabs. The hardware should then be coated with Renaissance Wax. The wax should be applied with a soft brush and allowed to dry. Once the wax is dry, the surface can be lightly buffed using a soft rag.

If you are uncertain if hardware is lacquered or not, it is advisable to test a small area of the surface. If a gummy surface develops after a small drop of acetone is placed on the surface, then a lacquer is present.

Hardware that is severely corroded may require polishing. The safest method is to use a paste consisting of gilders whiting (chalk) or fine rottenstone that has been mixed with ethanol (ethyl alcohol) and water 1:1. The paste should have the consistency of toothpaste. The paste can be gently rubbed on the surface of the metal using a soft cloth rag or cotton ball. Residual paste should be removed by wiping with a mixture of alcohol and water. This method may seem slow and time consuming, but it is the safest way to polish metals.

After the completion of polishing, the hardware should be handled only when wearing gloves to avoid depositing oils and salts from your hands. The hardware should then be degreased with acetone and a coat of Renaissance Wax should be applied.

The preferable and most durable coating for metal is lacquer. The most commonly used lacquer at The Henry Ford is Incralac. It can be obtained from Conservator's Emporium. The best way to achieve a durable and even coating is by spraying the lacquer onto the surface of the metal. However, spray lacquering in an unventilated area can present health hazards thus necessary safety measures must be followed. A detailed reference for the application of lacquer to bronze can be found on the Historic Preservation Technical Procedures web site at <http://w3.gsa.gov/web/p/hptp.nsf>. Incralac Spray lacquer is available from Custom Aerosol Packaging.

PAINTED AND FINISHED WOODEN CLOCK CASES

Extensive cleaning of severely damaged, or darkened finishes, should be carried out by a professional conservator. The care of porous or unfinished wood should also be left to a professional.

Owners of antique clocks should consider maintaining the original finishes on their antiques whenever possible. Original finishes often contribute to the historical value of an antique. Thus they are preferred over stripped, refinished, or heavily restored coatings on antiques.

The following suggestions are provided to assist in increasing the longevity of your wooden antiques. The procedures are recommended only for objects on which finishes

are in good condition and for items that do not have lifting or damaged veneer, inlays or gilding.

The first step in cleaning should always be dust removal. Dust should be removed using a soft brush or a vacuum cleaner nozzle with a soft brush attachment. This is recommended particularly on objects that have a rough or unfinished surfaces that could be snagged by dusting with a cloth. Unfinished wood should never be wet cleaned.

If wet cleaning is necessary and the finish is in good condition, the safest method of cleaning is the use of a dilute detergent. The detergents currently used most often here at The Henry Ford are Orvus and Triton X-100. Both products are available from Conservator's Emporium (see attached list of suppliers).

The detergents should be diluted to a concentration of approximately 1% in water. Using cotton balls or soft cloth diapers, the solution should be gently applied to the surface. Q-tips could be used to clean into small ornate carved areas and crevices.

After cleaning, residual detergent should be removed by rinsing with distilled water. The rinse water should also be applied using cotton balls or a cloth diaper. In both instances the cloth or cotton should be damp not wet. Water should not be allowed to sit on the surface as it could damage the finish. An absorbent sponge could be used to blot excess water from the surface.

After the surface is completely dry, a high quality wax such as Renaissance Wax could be applied with a rag or brush to finished wooden surfaces. This is not recommended for painted or gilded surfaces.

Upon drying (approx. 15 min.) the waxed surface should be lightly buffed with a diaper or a clean, soft shoe-polishing brush. Wax should only be applied occasionally, once a year or so, to avoid heavy wax build-up. If the finish becomes dull between applications of wax, it should be buffed with a rag or shoe brush to restore the luster of the finish.

CLOCK DIALS

The majority of clock dials can be cleaned in much the same manner as wooden clock cases. However, extra care should be taken to test any cleaning solution prior to proceeding. The numbers on clocks are sometimes soluble in water and can be removed by cleaning solution.

Metal Clock Dials - Brass or silver clock faces can be lightly polished using a paste polish. Always proceed with caution when polishing. Some objects are thinly coated with gold or silver, which can be accidentally polished away during cleaning.

A mild, inexpensive paste can be made by mixing gilders whiting (chalk) with a solution of ethyl alcohol (ethanol) and distilled water 1:1. The paste should be gently rubbed on the metal surface using cotton balls or soft cloth diapers. The remaining chalk can be brushed away or rinsed by applying ethanol on a soft diaper.

Again, care should be taken to test the polish if there is a painted design on the clock face. Many recessed numbers on metal clocks are colored with black wax that could be damaged by cleaning solutions.

REVERSE GLASS PAINTINGS

Reverse glass paintings are extremely fragile and difficult to maintain. We recommend that only by a trained conservator repair them. An inexpensive alternative to professional conservation is to replace the original painting with a reproduction. However, the original painting should always be saved. The original should be stored face down (with the paint side up) so that no pressure is placed on the fragile paint surface. A sturdy box will help to avoid damage until it can be properly conserved. Save all fragments of paint as they can be reattached by a conservator.

STRUCTURAL REPAIRS

METAL MOVEMENTS - Generally, structural repairs should be carried out by a professional.

WOODEN CASES - Repairs to wooden cases should be as unobtrusive as possible. Hot or liquid hide glue is preferred in most cases over modern commercial products for adhering loose fragments and veneer. The addition of mechanical metal attachments such as screws and mending plates should be avoided since they can constrict the movement of wood and can lead to cracking.

BIBLIOGRAPHY

Balcomb, Philip E. *The Clock Repair Primer – The Beginner’s Handbook*. Tempus Press, 1989. ISBN #0962045608.

De Carle, Donald. *Practical Clock Repairing*. London : N.A.G. Press Ltd., 1971. ASIN #0719800005.

Harris, H.G. Handbook of Clock and Watch Repairs. Enslow Publishers Inc., 1972. ASIN #0875231411

Penman, Laurie. The Clock Repairer's Handbook. David & Charles, 1984. ASIN #0668065338.

Plewes, John. Repairing and Restoring Pendulum Clocks. Sterling Publishing Co. Inc., 1984. ASIN #0806955147.

Sandwith, Hermione and Shelia Stainton. The National Trust Manual of Housekeeping. Penguin Books USA , 1986. AISN #0140076387

Smith, Eric P. Repairing Antique Clocks. David & Charles, 2002. ISBN #0715313185.

WOODEN CLOCK CASES

"Gilding and Surface Decoration". Preprints of UKIC Conference in Restoration. United Kingdom Institute for Conservation of Historic and Artistic Works. England.

"Journal of Wood Conservation". Spring 1985, Volume 1, Number 1. American Institute of Conservation, Washington, DC.

"The Conservation of Wooden Objects" 1970 New York Conference on the Conservation of Stone and Wooden Objects, Second Edition, Volume 2. International Institute for Conservation, England. ASIN #0950052515.

"Wooden Artifacts Group Publications". 1985-1994. American Institute of Conservation, Washington, DC.

Kuhn, Herman. The Conservation of Works of Art and Antiquities. Butterworths, London, 1987. ASIN #0408108517

McGiffin, Robert. Furniture Care and Conservation. The American Association for State and Local History, 1995. ISBN #0942063228.

SUPPLIERS

Woodcraft
210 Wood County Industrial Park



PO Box 1686
Parkersburg , WV 26102-1686
800-225-1153
<http://www.woodcraft.com>
(General tools and supplies)

Talas
213 West 35th Street
New York, NY 10001-1996
<http://www.talasonline.com>
(Renaissance Wax)

University Products
517 Main Street
PO Box 101
Holyoke , MA
800-762-1165
<http://www.universityproducts.com>
(Suppliers of humidity indicators)

Sepp Leaf Products 381 Park Avenue
New York , NY 10016
212-683-2840
(Suppliers of adhesives, whiting)
Timesavers
Box 12700
Scottsdale , AZ 85267
800-552-1520
<http://www.timesavers.com>
(Suppliers of high-quality clock oil)

Custom Aerosol Packaging PO Box 1411
Pique , OH 45356
800-237-6765
(Suppliers of aerosol Incralac)

Incralac Spray
12 oz. can (10 sq. feet)



No credit cards
Check or COD

REFERENCES

National Association of Watch & Clock Collectors
Great Lakes Chapter 6
6663 Sturbridge
Canton , MI 48187

FOR OTHER REFERRALS:

The American Institute for Conservation of Historic & Artistic Works
1717 K Street NW
Suite 200
Washington , DC 20006
202/452-9545
<http://aic.stanford.edu/>

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.

The Henry Ford and its staff strive to insure the accuracy and completeness of all information and assistance provided to patrons of the Conservation Information Service but accepts no responsibility or liability for the patron's subsequent use or misuse of any information or assistance provided. **These documents are for personal use and must not be reproduced for profit or any other commercial use without written authorization.**

Copyright © 2016 The Henry Ford
www.thehenryford.org
20900 Oakwood Boulevard, Dearborn, MI 48124-5029
Call Center: 313-982-6001 or 800-835-5237

