

Preservation of Wooden Objects

Light

Light damage is cumulative, so the more light an object is exposed to over its lifetime, the more damage will occur. Light damage is irreversible. Light levels should be set for the most vulnerable aspect of the object.

- 50 lux or less (5 foot candles or less) for very sensitive pieces, such as highly colored (pink ivory wood, purple heart, etc.), dyed woods
- 50-150 lux (5-15 foot candles) for less sensitive woods, paints, adhesives
- UV from your light source should be less than 75 microwatts/lumen

Relative Humidity (RH)

Keeping a constant RH is the most important factor in preserving wooden objects! As the RH increases, wood expands. As the RH decreases, wood shrinks. The same is true for varnishes and paints. Damage from fluctuating relative humidity includes distortions, cracks, and splits. This type of damage is usually irreversible.

Damage as an effect of too much RH fluctuation:

Fluctuation	Risk to Wooden Object
± 5%	No risk of Damage
± 10%	Tiny risk of damage
± 20%	Small risk of Damage
± 40%	Moderate to Severe Depending on Structure of Object

Museum set points for RH are typically 50% ± 5% as this is safe for the majority of objects. However, the appropriate RH set point for a particular object is dependant on its own unique history. A wooden piece that has been in a desert environment for its entire existence may require a lower RH set point than one that has been in a tropical climate.

Temperature

Temperature fluctuations can cause similar problems to those resulting from RH swings. Temperature settings for human comfort (around 70° F) are typically safe for wooden objects. However, varnishes and waxes may be more affected by extremes in temperature than relative humidity. Very high temperatures may cause coatings to soften, while very low temperatures may cause embrittlement resulting in cracking and flaking.

Damage as an effect of too much temperature fluctuation:

Fluctuation	Risk to Wooden Object	Risk to Varnishes and Waxes
± 10°	Tiny risk of damage	Small risk of damage
± 20°	Small risk of damage	Moderate risk of damage
± 40°	Moderate to Severe depending on structure of object	Moderate to Severe depending on previous exposure of the material

QUICK REFERENCE FOR DETERIORATION OF MATERIALS						
	Light	RH	Temperature	Handling	Pests/Mold	Contaminants
Wood	2-3	2-3	1	1-2	2	1
Varnishes and Coatings	2-3	1-2	2	1-2	1	2
Adhesives	2	1-2	2	1	0-1	1
Paints	2	2	2	3	1	2
Dyes and Stains	3	0	0	0	0	1
Metals and Metal Leaf	0	2	1	2	0	2
Bone, Ivory, Shell, Horn	3	2-3	1-2	1	2	1

Risk of Damage Rated 0 - 3
0= No Risk of Damage
1= Small Risk
2= Moderate Risk
3= High Risk of Damage

What YOU Can Do:

Light

- Keep your wood work out of direct sunlight.
- Use shades, blinds, and/or UV film on windows in rooms where your wood art is displayed.
- Use incandescent or LED lights, which put out less UV than fluorescent bulbs and tubes. Cover fluorescent light sources with UV-filtering films.
- Turn lights off or cover your wood work when no one is viewing it.
- Have a rotation of wood art on display so that every piece in your collection is not receiving light exposure all year round.
- Light/illuminance meters can be purchased to monitor your display spaces.

Relative Humidity (RH)

- Avoid keeping wood art above fireplaces, near heating/air conditioning vents, or in attics, basements, bathrooms, or kitchens, as these areas tend to have large RH swings and can also become very humid.
- Identify rooms or storage areas with the most stable environment and store/display wood objects there when possible.
- Monitor the environment with indicator cards or hygrometers, available at hardware stores and use humidifiers/dehumidifiers to mitigate extremes.
- With money and effort, microclimate cases can be created for very vulnerable works of art.

Temperature

- Avoid keeping wood art above fireplaces, near heating/air conditioning vents, or in attics, basements, bathrooms, or kitchens as these areas tend to have large temperature swings in short periods of time.
- Monitor the temperature in areas where you keep your wood works.

Pests and Mold

- Damp and dark environments, like basements, promote mold growth. Keeping RH levels below 70% and using fans to promote air circulation can be helpful.
- Watch for insect holes, casings, and piles of shavings accumulating.
- When creating wood work, start with wood that you are sure is not infested.
- If your wood art develops pests, consult a conservator or exterminator experienced with conservation issues. Pesticides are not recommended. Freezing or anoxic treatments may be necessary, but very specific freezing procedures are necessary to destroy insect eggs and freezing may damage wood art.
- Information on insect eradication from the National Park Service:
 - Freezing: <http://www.nps.gov/history/museum/publications/conservoogram/03-06.pdf>
 - Anoxic Environments: <http://www.nps.gov/history/museum/publications/conservoogram/03-09.pdf>

Use and Handling

- Don't move or handle wood art unnecessarily.
- Always know where you are going to put an object before you pick it up to move it and have a clear path to get there.
- Don't pick up objects by fragile or detachable parts- sometimes handles are not actually the best places to grab wood art.
- Use clean hands- metals are particularly damaged by oils in hands.
- Items that are prone to tipping can be stabilized by applying a **small** amount of wax (often called Museum Wax) to the underside or by having a mount made.

Care and Maintenance

- Preventing deterioration is always best!
- Dry dust your wood art with a soft bristle brush or soft cloth to prevent dust accumulation.
 - If you use a brush, cover the metal ferule with tape to avoid scratching your art.
- Dusting with the aid of a vacuum can be helpful for very dirty materials.
 - Use the hose attachment on LOW suction.
 - Cover the end of the hose with screen or cheesecloth to prevent loss of loose parts.
 - Use the brush to sweep dust toward the vacuum hose.
- Compressed air can also be useful for surfaces that catch on brushes or cloths.
- Wiping wooden objects with a lightly dampened cloth is usually safe- Avoid getting wood very wet.

Storage and Packing Materials

- Cover your wood art when in storage to prevent accumulation of dust and unnecessary light exposure.
- Use archival materials for packing and storage that will not chemically degrade and harm your wood works. Some of these materials are:
 - Acid free/lignin free tissues, papers and boards
 - Polyethylene and polypropylene bags, sheeting and foams
 - Soft Tyvek® (machine wash and dry before use, no fabric softener)
 - Unbleached plain cotton muslin (machine wash and dry before use, no fabric softener)
- Some suppliers of archival materials are:
 - Conservation Resources International- <http://www.conservationresources.com/>
 - Museum Services Corporation- <http://www.museumservicescorporation.com/>
 - Talas- <http://talasonline.com/>
- AVOID:
 - Flexible PVC products, including some cling wraps
 - Polyurethane foams
 - Poorly fitted containers
 - Storage on the floor, especially in basements
 - Storage in unstable environmental conditions (ex. attics and basements without climate control)

Resources for Care of Art

- American Institute for Conservation of Historic and Artistic Works- <http://www.conservation-us.org/index.cfm?fuseaction=Page.viewPage&pageId=497&parentID=472>
- *Saving Stuff: How to Care for and Preserve Your Collectibles, Heirlooms, and Other Prize Possessions*, Don Williams and Louisa Jaggar, Fireside Original/A Division of Simon & Schuster, 2005.
- *The Winterthur Guide to Caring for Your Collection*, Greg Landrey et al., The Henry Francis du Pont Winterthur Museum, 2000.