

## The Care and Preservation of

# OIL PAINTINGS

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### Introduction

Oil paintings 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, handling, and cleaning.

The use of oil paint dates back centuries but oil painting on canvas only became popular in 15<sup>th</sup> century Europe. Artists ground pigments with a binder (e.g., linseed or nut oils) to form a fluid medium that was then applied to a sized or primed support. Solvents were added to thin down the paint mixture and lead or natural resins were added to thicken. Due to their extended drying rates compared to acrylic or fresco, oil paints allow artists to manipulate their works over longer periods of time. Oil paint typically takes several weeks or months to dry due to polymerization of the oil instead of evaporation. A layer of varnish (natural or synthetic) is sometimes found on the surface of oil paintings as a protective layer or was selectively applied to enhance the saturation of colors during composition.

Identifying an oil painting compared to an acrylic painting is difficult even though their properties differ immensely. Oil paint tends to dry more matte compared to acrylics but additives to both can change their visual results. The most obvious difference is their respective reactions to solvents. Acrylics are very sensitive compared to oil paints. More information on caring for acrylic paintings is in a separate fact sheet.

Most fabric paintings are secured to a wooden frame that is commonly referred to as a stretcher or strainer. Stretchers are equipped with expandable corner joints that can be adjusted to ensure that the painting remains taught. The joints can be expanded by driving small wooden wedges into the interior corners of the stretcher at the back of the painting. This procedure is commonly referred to as "keying out" a painting. Paintings are also composed on other two- and three-dimensional surfaces such as wood panels, stone, paperboards, metal sheets, porcelain, and other fabrics.

### Types of Damage

The primary cause of damage to oil paintings is the storage or display of paintings in inappropriate environments. This includes display or storage in areas where there is excessive exposure to light, high and/or fluctuating temperature and humidity levels, dirt, or insects. Damage can also be caused by careless handling and the improper cleaning of paintings.

The most common cause of damage to paintings is due to careless handling. Physical force from dropping, bumping, puncturing, or vibrations can cause damage to the paint layers and support. It is important to avoid bumping canvas paintings as even the slightest bump can initiate cracking of the paint surface. The cracking can increase and spread over time as the canvas moves due to fluctuations in humidity. Cracks are also common to see in paintings when the fat over lean technique was not performed during composition. If the underlying paint (lean) is not allowed to dry before the application of subsequent layers (fat), drying cracks may form. As inappropriate levels of relative humidity occur, delamination and cupping of the paint may result.

Excessively high light levels can cause the fading and/or darkening of pigments. Some paintings darken so severely that the painting and its details are no longer visible. UV radiation from sunlight and some light sources also causes pigment fading and yellowing varnish. High light levels also

can cause damage due to excessive heat build-up.

Extremes and fluctuations in temperature and humidity can cause damage to paintings due to the expansion and contraction of the wood and fabric components of the painting. Wood and fabric absorb moisture which causes them to swell on humid days and conversely shrink on dry days. Wood panels can warp and even crack. Paint, however, is not as resilient and can crack and flake off as a result of expansion and contraction of the underlying wood and fabric structure. These dimensional changes can cause the canvas to become slack and sag during the winter months. Aside from the unsightly appearance of dirt on a painting, dirt also serves as a host for mold growth and the absorption of pollutants and moisture onto the surface, obscuring the image. Dirt can embed into the varnish and paint layers, abrade these layers and cause losses. Close proximity to smoking areas, cooking areas, and fireplaces can deposit nicotine, grease, and soot on the paint surface, darkening and/or yellowing the painting.

Insects that can cause damage to oil paintings include carpet beetles and powder post beetles. Carpet beetles generally subsist on protein-based materials that may be included as a sizing material on canvas paintings. Insects are most often found on the back of the painting between the canvas and stretcher. Holes/losses in the canvas, or the presence of worm-like insects or furry carcasses are an indication of carpet beetle problems. Powder post beetles characteristically bore small holes (approx. 2mm in diameter) into wooden materials. These holes are the first visible evidence of powder post beetle infestation. Frass, a substance that looks like saw dust, is also a good indication of an active infestation.

## **Storage**

The proper display and storage of paintings can be achieved by monitoring the environment in various rooms to identify the best area for the objects. To avoid damage caused by light, paintings should be displayed in dim or reduced exposure timed areas where no direct sunlight is allowed to fall on them. LED lamps are preferred due to their adjustability in color temperature. The suggested light level for paintings is 150 lux. The use of lights that are positioned close to the paintings such as the commercially available lights (e.g., halogen lights) that are mounted to the frame or directly above it should be avoided. Diffused spotlights should be mounted at least 10 feet from the painting to avoid potentially damaging heat buildup.

Paintings should not be keyed out during the winter months when the humidity is low. The increased tension caused by keying out may cause the painting to tear as the wooden stretcher expands during the humid spring and summer months. Acceptable temperature and humidity levels for paintings are as follows, keeping in mind that fluctuations should be kept to a minimum. A relative humidity (RH) of 45-55% is recommended but can be difficult to maintain without a humidifier to help with seasonal fluctuations. A constant temperature of 65-68 degrees F (18-20 degrees C) is recommended, but ideally never above 75 degrees F (25 degrees C). Temperature and humidity sensors are available through the conservation suppliers listed below. 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 ensuring that paintings are kept away from heat sources such as furnace vents, fireplaces, warm lights, and direct sunlight. Extreme fluctuations in temperature of attics should be avoided. Excessive humidity, as can be found in most basements, should also be avoided since it can cause mold growth that can stain the surface of the painting.

Framed paintings should always be stored vertically on sliding racks or slot storage. Unframed paintings can lay flat temporarily but check for sagging of the canvas. When leaning paintings against a wall, place padding and/or blocks beneath to prevent skidding and protect against damage. When stacking a group of paintings, stack by comparable size and orient face-to-face, back-to-back. Place a piece of cardboard that is larger than the paintings between both artifacts.

Remove protruding hardware and wiring before storing with other paintings so as not to cause tears and scratches.

When packing paintings for a move, ensure the painting is stable to travel. Wrap the painting with polyethylene (PE) or polypropylene (PP) bags or sheeting and secure with Mylar tape. Framed paintings should be wrapped in clear sheeting and sandwiched between two pieces of cardboard secured with tape. Ensure the corners are protected with extra cardboard sleeves. Some paintings may require a padded crate for safe handling across long distances.

### **Handling**

Prior to moving a painting, be sure to remove all jewelry, belt buckles, etc. so that the painting is not accidentally torn or scratched while being moved. When moving a painting, always be sure to grasp the painting from both vertical sides. Ensure knuckles and fingernails are not pushing into the canvas reverse. Do not wear cotton gloves when handling as getting a proper grip is difficult. Clean hands or nitrile gloves are preferred. Do not hold a painting at the top of the frame or by its hanging wire. If the painting is too large or heavy for one person to move, be sure to have extra hands and a guide to assist. Be aware of surroundings and plan ahead when moving to ensure no furniture with sharp corners could bump or puncture the painting and doors are opened. Never drag the painting. Also be careful to ensure that the picture wire does not puncture the back of the painting during the move. The painting should be securely bracketed into its frame and have sufficiently strong wiring for the weight and size.

### **Cleaning and Care**

In general, the cleaning of paintings should be left in the hands of a trained conservator. However, there are some simple procedures that can be followed to increase the longevity of a painting. Soft brushes can be used to remove surface dirt from paintings and frames. When dusting an oil painting care should be taken not to flex the canvas or to dislodge paint chips by bumping the painting. Paintings that have loose flaking paint should not be dusted as fragments of paint could be dislodged and swept away. The back of the painting should be kept clean by brushing or vacuuming. To clean the back, the painting should be removed from its picture frame and placed face down on a clean surface. Excessive dirt should be vacuumed using a small low suction nozzle with a brush attachment.

Proper framing with a backing board of corrugated sheeting (Coroplast) attached to the verso of the stretcher/strainer will prevent dirt from accumulating behind the painting. Holiday decorating in a manner that will cause damage to paintings should also be avoided. Live greens and berries can stain and damage frames and paintings. They also introduce pests into the environment. If surface dirt cannot be removed by dusting, cotton swabs that have been dampened with distilled water can be lightly rolled on the surface to remove dirt. Again, if there is flaking paint no attempt at cleaning should be made.

Paintings should be routinely taken down and examined for pests. 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.

### **Disaster Response**

In the event of a disaster, due to the many components of a painted artifact, its placement on the salvage priority list may reflect both its stability and its value. It is important that salvage priorities are considered before an emergency occurs. In the event of a fire, at minimum, intense heat can cause blistering of the varnish, paint, and ground layers. Soot and smoke deposits should be removed as soon as possible by a conservator to prevent permanent damage. Water used as a fire suppressant can cause further damage.

Water can soften, swell, and alter the physical properties of the painting materials. The moisture build up can cause mold contamination. Be sure to wear the proper personal protective equipment when handling moldy paintings before isolating them in a cool, air circulating area to dry out until a conservator can address the damage. Further discussion on salvage and disaster response can be found in The Henry Ford's conservation information sheet on that topic, and in various online resources.

## SUPPLIERS

### *Framing Materials, Brushes*

- Light Impressions, Inc.

<https://www.lightimpressionsdirect.com>

### *Visible Light Meter, UV Light Meter, Humidity Indicators*

- University Products

<https://www.universityproducts.com>

- Talas

<https://www.talasonline.com>

### *Packing & Storage Supplies: PP and PE Bags, Mylar Tape, Coroplast (White Corrugated Sheets)*

- Uline

<https://www.uline.com>

- Grainger

<https://www.grainger.com>

### *HEPA Filter Vacuum*

- Nilfisk

<https://www.nilfiskcfm.com>

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**To Find a Conservator:**

The American Institute for Conservation

<https://www.culturalheritage.org/about-conservation/find-a-conservator>

