

Conservation facts – Sculptures

Why do sculptures deteriorate?

It is vital that artworks are cared for if they are to last. Many factors influence the permanence of artworks. Sometimes there are inherent problems due to the quality of the materials and manufacturing processes. A combination of incompatible materials in a work of art may promote instability, or the material itself may be unstable. More often, careless handling and inappropriate methods of display and storage cause the most damage.

It is important to consider the environment in which you keep your artworks. Our everyday climate has levels of light, heat, moisture and pollutants which can produce destructive chemical reactions and physical changes within works of art.

Although it is impossible to prevent deterioration completely, modifying the environment helps slow down the process of decay. This is good conservation. Taking a few simple steps can significantly aid the preservation of your artworks. Remember, not all damage is reversible – prevention is always better than cure.

Caring for your sculptures

Here are some of the ways artwork can be damaged, and advice on how to prevent this.

Light

All light causes irreversible damage to artworks. The extent of the deterioration depends on the type of light source, its intensity and the length of exposure.

Natural light is an extremely intense source of energy and contains ultra-violet (UV) radiation. Sculptures which contain or are made from organic materials, such as plastics, textiles and wood, are especially vulnerable to UV wavelengths, which cause embrittlement, discolouration or chemical deterioration. Even coatings on inorganic materials, such as stone or metal, are affected.

The effect of artificial light is less acute, although fluorescent tubes do emit substantial amounts of UV. Incandescent light sources, such as everyday light bulbs, are the least harmful, but the heat they generate can still, like sunlight, impair an artwork.

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- Damaged caused:**
- Textiles and plant materials fade or yellow, and they can split or become brittle.
 - Wood can become patchy, cracked and faded, and coatings or paint on the surface may discolour and become uneven in tone. Heat from a light source can cause damage.
 - Light also damages plastics and rubber, causing discolouration, crazing, brittleness, and changes in transparency and/or gloss over a very short time.
 - Metal, stone and ceramic are least affected by light but their coatings – a paint, lacquer or wax, for example – can discolour or soften.

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- What to do:**
- Restrict the amount of light and the length of exposure time for any artwork.
 - Keep all artworks away from direct or strongly reflected light. When sunlight is falling on the object, move it, if possible.
 - Reduce the light levels by closing the curtains. Coat windows with a clear UV film.
 - Use low-wattage incandescent bulbs in preference to fluorescent tubes.
 - Never spot-light an object with a bright light source.
 - Consider placing your outdoor sculpture in a shaded area.

Relative humidity and temperature

Most organic materials used to make sculptures will absorb or release moisture in response to changes in the environment.

Relative humidity is a measurement of the amount of moisture in the air. Changes in temperature affect the amount of moisture that air holds. Extremes and fluctuations of temperature and humidity are the most damaging to artworks because they set up a cycle of rapid expansion and contraction, which places the artwork under stress. Both humidity and temperature need to be controlled.

- Damaged caused:**
- Sculptures made from a number of different materials have increased stresses as the individual materials respond at different rates, causing parts to become loose, separate, or split and crack.
 - Wood can shrink and crack in hot dry conditions and swell and warp in wet cold conditions. Ivory, especially, cracks and splits with fluctuating humidity.
 - Mould growth flourishes in high temperatures and humidity. It disfigures, sometimes causing permanent stains, and attacks the surface of the work. Mould and wood-rotting fungi can cause considerable damage, and thrive in damp and unventilated conditions.
 - Corrosion and rust can occur on your metal artworks. These threaten the work structurally. Corrosion expands and can put pressure on surrounding materials, causing splitting of wood, lifting of paint and staining.
 - The molecular structure of plastics mean they react with moisture easily. If the air is too dry, plastics can become desiccated and brittle. Under high temperatures, they can distort or melt.
 - Insects and rodents flourish in a warm, damp climate and may chew their way through your valued textiles, carvings and objects.
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- What to do:**
- Avoid placing sculptures in damp rooms, against outside walls, or near water sources, such as bathrooms and kitchens.
 - Never display works above or near electrical equipment, heaters, radiators, fires and gas heaters.
 - Do not leave artworks in unventilated areas such as cupboards.
 - Check artworks regularly for any sign of mould growth, insect activity or changes in surface patinas.
 - Use dehumidifiers to stabilise/lower humidity levels.
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Dust, dirt and insects

New Zealand's mild, wet climate provides the perfect breeding ground for insects and mould.

Insects will attack artworks in a variety of ways, resulting in a range of damage. This may be visible as small holes in wood and textiles, spot stains on the surface of an artwork, extensive loss of internal structure or disfigurement of the surface decoration.

Dust is always present in the air. In direct contact with the surface of artworks, it is not only disfiguring, but also abrasive.

- Damaged caused:**
- Borer destroys wood internally. As a result, the damage is not often recognised until too late.
 - Carpet beetle and clothes moth eat all sorts of textiles, leaving holes and grazed surfaces. Silverfish will attack fabric as well as paper. Other beetles, for example drugstore and cigarette beetles, eat a wide variety of plant- and animal-based materials.
 - Cockroaches also eat a range of materials and cause further damage by gluing egg cases onto objects.
 - Dust attracts moisture. A build-up of dust on the surface and in the recesses of a sculpture provides a perfect site for corrosion and mould to occur.
 - Dust and fine particulate dirt can scratch and disfigure the smooth surface of plastics, resins and fibreglass.
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Outdoor sculpture

As well as extremes of climate which can cause deterioration to outdoor sculpture, factors such as wind, plants, people, animals and birds, also cause damage.

Outdoor sculpture is exposed to atmospheric pollutants which can interfere with the protective patina of metal sculptures, and damage concrete and stone works.

The positioning of outdoor sculpture is important. Overhanging trees may drop leaves and branches onto the work, and there may be an increase in bird droppings. Water should be able to drain away from the base of the work to prevent pooling of moisture, and plantings should be clear of works so that small animals and insects are not encouraged to make the sculpture their home.

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- Damaged caused:**
- Sunlight, UV radiation, high temperatures, high humidity and extreme seasonal fluctuations cause discolouration, fading, brittleness and cracking of the work, lifting and peeling paint, blanching and disruptions to other types of coatings.
 - Pooled or trapped water will cause corrosion and rot. Even small amounts of moisture beneath accumulated dirt and debris can be damaging.
 - Water-soluble salts, which are present in natural stone and man-made brick and concrete materials, can cause the growth of crystals on the surface and the lifting off of surface material.
 - Freezing water trapped in cracks and fissures expands and can cause further splitting and cracking.
 - Wind-borne dirt can abrade surfaces, wear down parts and inhibit moving elements.
 - Large objects, such as tree branches, can cause breakages by falling on or against sculpture. People and animals can also cause breakages and surface damage by climbing on, rubbing or leaning against artworks.
 - Sometimes small plants can grow on works, getting a foothold in fissures and causing splitting and cracking. Lichen can stain marble, concrete and stone and weaken wood. Stains can be difficult to remove from porous artworks.
 - Bird droppings turn acidic and damage the surface of sculptures or initiate corrosion.

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- What to do:**
- Regular maintenance is important.
 - Wash surfaces to prevent the build-up of dirt.
 - Remove bird droppings.
 - Ensure there is good drainage around the work and keep grass or surrounding plants at a low height.
 - Be aware of flying sticks and stones from lawn mowers.
 - Look for areas where moisture can become trapped.
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