

## Conservation at the V&A Glossary for Environmental Care

**absolute humidity** The amount of water vapour (in grams) in 1 cubic metre of air. Unlike relative humidity, absolute humidity does not vary with temperature changes.

**activated charcoal** Material used as a filter when necessary to remove gaseous pollution and odours. Odorous and polluted air passes through a filter medium of high retentive granular carbon, the pollutant being removed by retention in its cellular structure.

**air-conditioning** A system of providing and maintaining an internal atmospheric condition within predetermined limits, irrespective of external conditions.

**air handling unit (AHU)** A broad term covering factory-assembled equipment capable of carrying out several or all the following functions of adjusting the properties of air: filtration, cooling, heating, humidification, dehumidification, and circulation.

**annual maximum light exposure value** Exposure (in lux hours) is a measure produced by multiplying illuminance (in lux) by time (in hours). Sometimes termed cumulative light exposure or integrated light exposure.

**buffer material** A material that responds to changes in ambient relative humidity by taking up and releasing moisture.

**building management system (BMS)** A computerised control system that can be programmed to provide monitoring of the internal environment, control of lighting, heating, ventilation and air-conditioning systems, and plant and energy management. Its use can be extended to include leak detection and response.

**calibration** An appropriate method of checking the accuracy (but not precision) of a measuring instrument against a recognised standard.

**colour appearance** The apparent colour of light that a lamp emits (e.g. warm, cool). Colour appearance can be expressed as colour temperature, which can range from a warm colour (having a low colour temperature) to a cool colour (having a high colour temperature). Colour appearance gives no indication of **colour rendering**.

**colour rendition index (CRI)** The appearance of surface colour when illuminated by light from a given source. It encompasses the effect of light emission from a source, light absorption and reflectance of surfaces, and human perception. It indicates how a lamp renders coloured objects compared to a reference source of approximately the same colour temperature. As the colour rendering approaches the reference source, the CRI approaches 100.

**condensation** When a given volume of air is at **saturation** point, and the temperature remains unchanged while more moisture is added to the air, this extra moisture will not vaporise. It will condense on cold surfaces as droplets. If instead no moisture is added to a volume of air at saturation point but the temperature drops, condensation will also form as the excess moisture in the air condenses on to cold surfaces. For localised condensation saturation and a surface colder than the surrounding air are necessary.

**control set-point** The value to which an automatic control of a mechanical system must be pre-set in order that a given desired value is achieved.

**cosine correction** A good light meter will have a photocell which is cosine corrected. This means that it is designed with an angular correction factor to compensate for light falling on the photocell at different angles.

**dehumidification** The process of extracting moisture from the air in a controlled manner.

**electromagnetic spectrum** The complete range of electromagnetic radiation from radio waves – those with the longest wavelength – through microwaves, the **infra-red**, visible light, **ultraviolet** radiation and x-rays to gamma rays – those with the shortest wavelength, the more energetic radiation.

**fibre optic lighting** Glass or plastic internally reflecting fibres are grouped into bundles of tails which are assembled into fibre optic harness attached to an auxiliary light source. Light from the source is reflected along the fibres and is emitted from the tip of each tail. Fibre optic lighting is low in ultraviolet radiation and heat.

**fluorescent lamp** An electrically efficient way of producing light radiation - much of it is ultraviolet (UV) radiation that is converted to visible light by coating the inside of the fluorescent tube with fluorescent paint(s), which absorbs the UV and re-emits its energy as visible light.

**humidification** The process by which moisture is added to the air in a controlled manner. The three main practical methods are by atomising water droplets into the air, evaporation or steam injection.

**hygrometer** An instrument capable of a direct reading of **relative humidity**. Its operation relies upon an element possessing hygroscopic characteristics of linear variation relative to the moisture content of the air and which is mechanically transmitted to a pointer moving across a suitably calibrated scale.

**illuminance** The amount of luminous flux reaching a surface. The unit of measurement is the lux, a System Internationale unit equal to 1 lumen per square metre; 1 candle at a distance of 1 foot will illuminate a surface of 1 square metre to approximately 10 lux (10 lux = 1 foot candle).

**infrared radiation** This band of radiation lies between radio waves and visible light. It has a longer wavelength than **ultraviolet** (UV) radiation, which means that it is less damaging. In air, infrared radiation is converted mainly to heat. It can be measured using a thermometer.

**inorganic materials** Materials that have a mineral origin, such as ceramics, glass, stone and metals.

**interventive conservation** The processes by which objects which have suffered damage or decay are treated and made stable in a laboratory, studio or workshop.

**Kelvin temperature scale (K)** Devised by Lord Kelvin in order to provide a temperature scale having no dependency upon the physical characteristics of any substance. Zero Kelvin is equivalent to  $-273.15^{\circ}\text{C}$ .

**lux** See **illuminance**.

**moisture equilibrium** If the quantity of humidity present in air is in balance with the quantity of moisture present in a **hygroscopic** material such as paper or wood, the material is said to be in equilibrium with the surrounding air.

**NO<sub>x</sub>** A mixture of gaseous nitrogen oxides. The predominate species being nitrogen dioxide (NO<sub>2</sub>) and dinitrogen tetroxide (N<sub>2</sub>O<sub>4</sub>).

**O & M manual** An operation and maintenance manual which explains clearly and in detail, the working and servicing requirements of equipment. It should be updated periodically to reflect work that has been done. It should include names and addresses of suppliers and drawings and diagrams where necessary.

**organic materials** Materials that have an animal or vegetable origin, such as leather, textile and wood.

**ozone** A highly reactive form of oxygen with a chemical symbol of O<sub>3</sub>.

**passive monitor** A device which requires no energy input to check on any one of a number of conditions, such as pollution.

**pollution** May be defined as the presence of substances in the atmosphere, resulting from man-made activities or from natural processes, causing adverse effects to man and the environment.

**preventive conservation** A term used to describe the broad function of care of a museum collection. It requires both technical and management skills, and an understanding of how its preservation may be affected by the way it is used by people within and outside the museum.

**preventive maintenance** This is carried out at predetermined intervals, and is intended to reduce the probability of failure.

**psychrometric chart** A set of graphs combined on a single chart to plot the relationships between temperature, air pressure and moisture content to specify relative humidity.

**radiotelemetry** A system by which radiowaves of an appropriate frequency are used to transmit information between sites in different locations.

**relative humidity (RH)** The relationship between the quantity of moisture present in a volume of air (**absolute humidity**) and the maximum quantity of moisture that could exist in the same volume of air (i.e. at saturation, q.v.), expressed as a percentage.

relative humidity (%) = absolute humidity/ saturation X100

**saturation** The point at which liquid water stops evaporating into the air as water vapour and the volume of air in question has absorbed the maximum amount of moisture it can hold. Saturation occurs at different temperatures for a given volume of air - the higher the temperature, the more moisture can be absorbed.

**silica gel** A granular material that is produced in various particle sizes. It is known mainly for its drying properties, but it behaves like organic materials in so far as it can take up water from moist air and release it when the air is dry. It can do this quickly and has a large moisture reservoir.

**specific moisture reservoir** The moisture (in grams) absorbed by 1 kilogram of buffer material with an increase of 1 per cent RH.

**spectral power distribution** The relative power of light from a light source in different parts of the spectrum. Different light sources have different spectral power distribution curves.

**spot reading** The use of meters in environmental monitoring to carry out random checks or various parameters such as light, relative humidity, temperature, and pollution.

**SO<sub>x</sub>** A mixture of gaseous sulphur oxides. Usually the predominant species is sulphur dioxide.

**thermohygrograph** An instrument which records on a graph ambient temperature and relative humidity. The former is done by use of a bimetallic strip and the latter by use of a hair element. Information is mechanically transmitted to independent pointers which register the readings as a graph on a rotating drum.

**tungsten filament lamp** The ordinary, domestic (General Service Lamp) is the most common lamp of this type. It operates by heating a tungsten filament to incandescence in a glass envelope filled with inert gas. It produces more heat than visible light.

**tungsten halogen** This is similar to a tungsten filament lamp except that halogens are used as the gases within a small glass envelope. It produces more ultraviolet radiation than heat, so a glass shield is needed to suppress it.

**ultraviolet (UV) radiation** The band of the electro-magnetic spectrum most damaging to museum materials, lying between visible light and X-rays. It can be measured using UV monitor and can be controlled using filters.

**VOCs (Volatile Organic Compounds)** Substances containing carbon and different proportions of other elements such as hydrogen, oxygen, fluorine, chlorine, bromine, sulphur, or nitrogen; these substances easily become vapours or gases. A significant number of the VOCs are commonly used as solvents (paint thinners, lacquer thinner, degreasers, and dry cleaning fluids).

### **Glossary based on:**

Environmental Management, Guidelines for museums and galleries, May Cassar, Routledge, London 1995. Pages 145 – 148. ISBN 0 415 10559 5.

With additions and amendments by Graham Martin, April 2003.