

Humidity Control for Record Preservation

The problem

Moisture is the most important factor in environmental control for records as excess humidity causes corrosion on metals and microbial activity on organic materials. In order to limit chemical deterioration of records. It is today widely accepted that 50% RH is the upper limit of acceptable humidity with the lower limit being 20% RH.

Temperature and pollutants are also important factors in preserving documents. In general the humidity and temperature have to be as stable as possible and pollutants should be kept at a minimum.

The Weather Factor

Throughout relatively short time cycles of 24 hours, the atmospheric air pressure at any location may remain virtually constant. However, temperature and moisture content vary and this is reflected in the way relative humidity (RH) alters throughout the day and night.

The average RH for the year is often much higher than many people would imagine, and is greatly influenced by near saturated conditions which prevail during winter and at night.

The consequences of these naturally varying humidity ranges can be disastrous if unconditioned air is allowed to come into contact with material of a sensitive and hygroscopic nature.

It is clear that the natural climate in any location can produce extreme humidity variations throughout each day.



Galleries, Libraries, Archives & Museums



Benefits

- Mould Prevention
- Condensation Prevention
- Corrosion Prevention
- Controlled Humidity
- Stability



Munters

The Humidity Expert



Galleries, Museums, Libraries and Archives

Galleries, Museums and Libraries are public places requiring ventilation air that carries a high moisture load. For these types of buildings a dehumidifier treating the load at its source, the fresh air, is most suitable. i.e before it enters the building. Archives have less public access and therefore less ventilation so treating the return air is more appropriate.

Storage Conditions

In properly temperature and humidity controlled stores, the preservation life of most records can be significantly increased. In the case of colour photographs, the preservation life can be increased from 25 years at 24°C, 50%RH to 1,000 years at 20°C, 40% RH. Similarly, poor paper life can be extended from 50 years at 20°C, 50%RH to 200 years at 16°C, 25%RH.

The following represents typical recommendations for long term preservation storage conditions.

Paper

- Files
 - Cards
 - Computer print-outs
 - Maps and plans
 - Charts
- 20°C, 50%RH

Photographic Media – Black and White

- Sheet film
- Cine film
- XRays
- Microfische
- Glass Plate Photos <18°C, 35%RH

Photographic Media – Colour

- Sheet film
 - Cine film
- <5°C, 35%RH

Magnetic Media

- Computer tapes and disks
 - Video tapes
 - Audio tapes
 - Magneto-optical disks
 - Optical Media
 - Compact and mini disks
 - Laser discs
- 18°C, 35%RH

Air conditioners are designed to cool buildings with the equipment controlled by a thermostat. Air conditioners provide temperature stability only. In a temperature only controlled building, humidity will continue to fluctuate with typical yearly ranges of 20 to 80%RH.

This is because thermostatically controlled cooling systems only work for a short period of each hour. As soon as the thermostat is satisfied, the compressor shuts off, the coil stops cooling (and dehumidifying), and moisture remaining on its surface can re-evaporate back into the air. At the

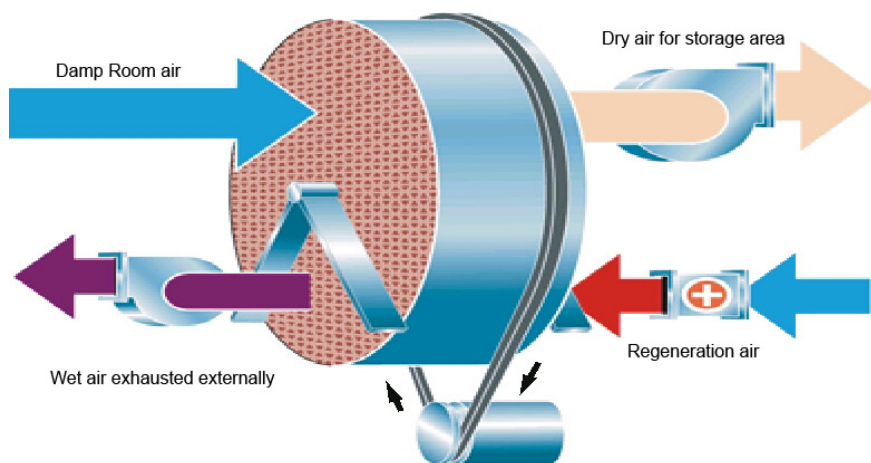
same time, humid or ventilation air flows through an inactive coil, flooding the building with excess humidity. The net result is that this type of cooling system removes very little moisture when the moisture loads remain high. The compressor does not run long enough to make condensed moisture actually drip off the coil into the drain.

Munters Dehumidification Technology

Munters equipment removes moisture from air using a desiccant wheel, which easily attracts and holds water vapour. Desiccant dehumidifiers are uniquely suited to removing moisture from air at low temperature and humidity.

The desiccant is impregnated into a wheel. Air passes easily through the flutes, contacting the desiccant. The wheel rotates slowly between two air streams. The incoming air stream gives off its moisture to the desiccant. The process air is dry as it leaves the wheel. The now humidity-laden wheel rotates slowly into a second, smaller heated air stream. This exhaust air stream, referred to as the reactivation air, warms the desiccant, allowing the desiccant to give off the captured moisture, which is carried away by the reactivation air. The newly dried desiccant material is then rotated back into the process air, where it absorbs moisture once more, recommencing the DH cycle.

To find out more why not contact your local office or visit www.munters.com



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