

Control of temperature and humidity is critical in the preservation archival collections. Heat accelerates the rate of most chemical reactions, including deterioration. High relative humidity provides the moisture necessary to promote harmful chemical reactions in materials and, in combination with high temperature, encourages mold growth and insect activity. Fluctuations in temperature and relative humidity are also damaging. Archival materials are hygroscopic, readily absorbing and releasing moisture. They respond to changes in temperature and relative humidity by expanding and contracting. Dimensional changes accelerate deterioration and lead to such visible damage as cockling paper, flaking ink, and warped covers on books.

Installation of adequate climate controls will retard the deterioration of materials considerably. Recommendations are a stable temperature no higher than 70°F and a stable relative humidity between a minimum of 30% and a maximum of 50%. Relative humidities at the lower end of this range are preferable since deterioration then progresses at a slower rate. In general, the lower the temperature the better. If temperature and humidity consistently persists outside the acceptable parameters, you can have outbreaks of mold, which is a public health concern as well as a preservation concern.

If you are able to replace or improve your HVAC system, maintaining stable conditions will be crucial. You should choose a temperature and relative humidity within the recommended ranges that can be maintained twenty-four hours a day, 365 days a year. The climate-control system should never be turned off, and settings should not be lowered at night, on weekends, or at other times when the archives room is closed. After making any changes to your system, temperature and relative humidity should continue to be systematically measured and recorded because this will indicate whether climate-control equipment is operating properly and producing the desired conditions. Remember that changing one factor may alter others. The importance of continued monitoring after the institution of a change cannot be stressed too much.

**Failure to control heat and humidity levels results in irreparable damage.**

**Example: Mold can appear within 48 hours**



**Planar distortion - include cockling, buckling, waves, curling, folds, wrinkles, and creases due to fluctuations in temperature and humidity. The constant absorption and removal of moisture from a document will cause the paper to wrinkle and buckle.**

