Preventive Conservation for Cultural Properties in Historic Buildings: Practical Environmental Control and Lighting at the Shelburne Museum

Richard L. Kerschner
Class 1: Open Structures

Covered Bridge

Locomotive 220
Horseshoe Barn
Class 3: Framed Wood or Uninsulated Masonry Structures

Prentis House
Class 4: Tight Wooden or Heavy Masonry Structures

Dorset House
Class 5: New-built Insulated Structures, Vapor Barriers

Pleissner Gallery
Class 6: Double-wall Construction, Storage Vaults

Museum Library
Conservation Ventilation
(humidistatically controlled)
Conservation Heating
(humidistatically controlled)
Prentis House
Modified Use of Conventional HVAC Systems

Hat and Fragrance Unit
Conventional HVAC System with Low-Level Humidification

Stagecoach Inn
$OT > 32^0F = 45\%RH$

$32^0F > OT > 20^0F = 40\%RH$

$OT < 10^0F = 35\%RH$
Vaisala RH Sensor
Practical Environmental Control for Newer Buildings

Collections Preservation Building
Conservation Heating with DX Cooling

Decorative Arts Storage
Decorative Arts Storage  T and RH  2005

Temperature

Relative Humidity

Temp Performance Target:  65 F +/- 20F

RH Performance Target:  50% RH +/- 15%

Actual Temp vs Target

Actual RH vs Target
Circus Building
Carousel Goat with Mold on Leather
Mr. Slim® Split-ductless Systems
Redefining Comfort

R410A INVERTER

M-Series Indoor Unit

Wireless
M-Series Remote

M-Series Outdoor Unit

In the images, we see a living room area with a ceiling fan and a wall unit. The wall unit has multiple shelves and some decorative items, such as a painting and a potted plant. The living room appears to be well-furnished and conducive to comfort.
RIA Dimmed 11/06 to 12/06 (31 Days) Period: 10 mins

- Lux x 10
- UV μW/Lm x 10
- °F
- %RH

Nov 2006
No Filter on Window

Bronze Tinted Plexiglas on Window
95% of Natural Light Blocked
Bright LEDs - Inconsistent Color
LIA Alternating Nichia E2 and F2 LEDs
Lessons Learned developing LED case lights

- High quality LEDs are now available for in-case lighting
- Work with a reputable, interested, and willing manufacturer
- New technology is riskier than tested systems
- Be prepared to make adaptations and changes
- Definitive answers are not always available
- Warrantees are essential
- Lighting mock-ups using artifacts are essential
- Purchase bright LEDs and use dimmers to reduce light and heat
- Minimize natural light entering exhibit spaces
- Involve everyone with a stake in the outcome
Miniature Millinery Shop

Old Tungsten Lighting

New LED Lighting