Old objects

New guidelines

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Colloquium 'Advanced Tools for Preventive Conservation'
Brussel, 29 april 2016
The problem
Diagnostics
The Museum Environment

Thomson
The solution
The current situation
What is the relation between Condition & Risk?
Condition ↔ Exposure in the past
Archival research

1722
Inventory
mevrouws camer
1 cabinet
Condition in 1977
Condition in 2010
$t_{1/2} = 4$ days  
$t_{1/2} = 11$ days
Predicted indoor climate conditions; unheated room

Z. Huijbregts et al, *Journal of Cultural Heritage*, 16(4), 419-427
Oak wood substrate, board

Veneer layer, marquetry with multiple wood grain directions

Cleat
<table>
<thead>
<tr>
<th>Core construction</th>
<th>Doors of Dutch furniture n = 138</th>
<th>Early Dutch panel paintings n = 254</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Restained</td>
<td>Non-restrained</td>
</tr>
<tr>
<td></td>
<td>54%</td>
<td>46%</td>
</tr>
<tr>
<td>Glue joint failure</td>
<td>90%</td>
<td>1%</td>
</tr>
<tr>
<td>Crack in wood</td>
<td>8%</td>
<td>4%</td>
</tr>
<tr>
<td>Out-of-plane deformation</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td>Shrinkage without cracks *</td>
<td>6%</td>
<td>65%</td>
</tr>
</tbody>
</table>
Cultural values

Climate risks to moveable collections

Mitigation
A new publication
“Managing Indoor Climate Risks”
Effects of the control strategy on the cultural values of the collection, building and interior(s) are analysed.
What matters to you?
<table>
<thead>
<tr>
<th>Objectives</th>
<th>Possible attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimize the rate of deterioration</td>
<td>Length of cracks (cm)</td>
</tr>
<tr>
<td></td>
<td>Number of cracks (#)</td>
</tr>
<tr>
<td></td>
<td>Surface area of mould (cm²)</td>
</tr>
<tr>
<td></td>
<td>Number of mould out breaks (#)</td>
</tr>
<tr>
<td></td>
<td>Degree of polymerisation (cellulose based materials) (#)</td>
</tr>
<tr>
<td></td>
<td>Folding number (#)</td>
</tr>
<tr>
<td></td>
<td>Tear and tensile strength (kN/m)</td>
</tr>
<tr>
<td></td>
<td>Corroded area (cm²)</td>
</tr>
<tr>
<td></td>
<td>Colour change: ΔE (-)</td>
</tr>
<tr>
<td>Maximize access to (the cultural values of) the collection</td>
<td>Number of visitors (#)</td>
</tr>
<tr>
<td></td>
<td>Number of visitors to the study collection, eg reading room (#)</td>
</tr>
<tr>
<td></td>
<td>Number of objects on (inter)national loan (#)</td>
</tr>
<tr>
<td></td>
<td>Number of loan requests (#)</td>
</tr>
<tr>
<td></td>
<td>Number of exhibitions (#)</td>
</tr>
<tr>
<td>Maximize income</td>
<td>€, $</td>
</tr>
<tr>
<td>Minimize costs</td>
<td>€, $</td>
</tr>
</tbody>
</table>
What is the relation between the building and the collection?

The collection is not historically linked to the building

The values of the collection are unequal to the values of the building

Collection > Building

The primary function of the building is to provide optimum protection to the collection, not from the outside. The building values are significantly lower than the collection values.

Examples:
- Storage facilities
- Newly built museums

Climate control options
- Use of room
- Use of collection
- Changing infiltration
- Changing ventilation
- Changing insulation
- Use of HVAC
- Use of mobile equipment
- Use of microclimate boxes

The collection is historically linked to the building

The values of the collection are equal to the values of the building

Collection = Building

The collection is housed in a historic building with cultural significance. The building values are very similar or equal to the collection values.

Examples:
- Cathedral / Church
- Most art museums
- The J.P. Getty Museum
- Metropolitan Museum of Art

Climate control options
- Use of room
- Use of collection
- Changing infiltration
- Changing ventilation
- Changing insulation
- Use of HVAC
- Use of mobile equipment
- Use of microclimate boxes

The collection is inextricably linked to the monument (museum) building and together they form an ensemble or 'gesamtkunstwerk'. The building values are equal to the interests of the collection.

Examples:
- Rijksmuseum, Amsterdam
- Louvre, Paris
- British Museum London

Climate control options
- Use of room
- Use of collection
- Changing infiltration
- Changing ventilation
- Changing insulation
- Use of HVAC
- Use of mobile equipment
- Use of microclimate boxes

c = conceivable option / p = problematic, strategy requires careful consideration and possibly research
What will this newspaper look like in 50 years?
Wooden floor
Driving rain
Leakage
Ground water
Relative Humidity
Tide marks
Salt crystalization
Freeze-thaw damage
Rot / Fungi
Rot / Fungi
Wooden floor
Ground water
An incorrect indoor climate
- Based on collection needs
- Based on human comfort
- Based on building needs

Use and design of the building
- Director
- Curator
- (Restoration) architect

Climate specifications

Options to control in the indoor climate
- Doing nothing
- Changing RH and/or T setpoints
- Relocating objects
- Changing use of collection/building
- Creating micro climates
- Adapt zoning
- Optimising building physics
- Local T and/or RH control
- HVAC
- ...

Building engineering physicist (passive control)
Climate consultant engineer (active control)
Where does the energy come from?
<table>
<thead>
<tr>
<th>Option 1</th>
<th>Total costs</th>
<th>Building</th>
<th>Collection</th>
<th>Experience value</th>
<th>Architectural value</th>
<th>Etc.</th>
<th>Robustness</th>
<th>Lifetime</th>
<th>Volume / size</th>
<th>Access</th>
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</thead>
<tbody>
<tr>
<td>Generation</td>
<td>250,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>0</td>
<td>-</td>
<td>--</td>
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<td>-</td>
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<tr>
<td>Distribution</td>
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<td>0</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Delivery</td>
<td>15,000</td>
<td>+</td>
<td>+++</td>
<td>-</td>
<td>-</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>++</td>
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<tr>
<td>Measuring</td>
<td>5,000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<td>+</td>
<td>++</td>
<td>++</td>
<td>++</td>
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<tr>
<td>Total system</td>
<td>320,000</td>
<td>+</td>
<td>+++</td>
<td>--</td>
<td>---</td>
<td>+++</td>
<td>++</td>
<td>+++</td>
<td>+++</td>
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</table>

<table>
<thead>
<tr>
<th>Option 2</th>
<th>Total system</th>
<th>50,000</th>
<th>++</th>
<th>++</th>
<th>---</th>
<th>--</th>
<th>++</th>
<th>+</th>
<th>-</th>
<th>++</th>
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</table>

<table>
<thead>
<tr>
<th>Option 3</th>
<th>Total system</th>
<th>75,000</th>
<th>+++</th>
<th>+++</th>
<th>+</th>
<th>--</th>
<th>+</th>
<th>-</th>
<th>+</th>
<th>+</th>
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</table>
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