Sci4Arts (NWO) Project

Summary of the Clim4Wood project

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Many materials, such as textiles, wood and paper are found in museum collections and react to humidity in the air. When they adsorb and release moisture the objects become larger or smaller on the microscale. If this movement is restricted, stresses build up, which can lead to damage, such as cracking, deformation and flaking of material.

Museums are responsible for the preservation of their collections. One of the main risks is damage caused by shrinkage or warping of objects. This notion led to museum climate specifications that became narrower in every decade; starting with a relative humidity that should be kept between 50% and 65% (1958) and ending with 51% ± 1,5% in 2003. The sustainability of a museum needs a proper balance between cost and the preservation of the collection.

The project aim is to identify the relative humidity fluctuations that decorated wooden panels can safely sustain (the „allowable" fluctuations) and (2) in consequence to develop rational guidelines for the climate specifications in museums. Therefore it is important to understand the response of the decorated wooden panels and the damage failure criteria. The outcome will enable the **development of a decision-making model that will help museums to identify the maximum allowable fluctuations for decorated panels.**

Figure 1: Left the Van Mekeren cabinet, Rijksmuseum; two details of a Van Mekeren cabinet in Amerongen Castle showing the condition in 1977 (middle) and in 2011 (right).

Well known examples of susceptible objects found in museum collections are: panel paintings, picture frames, cabinet doors (see figure 1), paintings on canvas and globes. In this project, called **Climate effects on decorated wooden panels**, abbreviated as „Climate4Wood", four research groups work together to link damage found in museum collections (Rijksmuseum Amsterdam) to material properties (Cultural Heritage Agency), so that based on mock up studies and object behavior (Technical University Delft) a numerical model can be developed to allow risk predictions (Technical University Eindhoven). Since one of the most susceptible materials found in museum collections is wood, and since the risk of damage is closely related to constructions, it was decided to focus the research specifically on flat decorated panels. These include: highly decorated panels, such as veneered doors painted panels.