

A preliminary survey on the environmental conditions of conservation of the Giorgione's panel painting of Castelfranco Veneto

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The Giorgione's panel painting showed problems of conservation depending on many factors. It is located in a Chapel of the Dome hanged at a wall which is neighbouring with the central heating of the church.

The deterioration of the panel painting is depending on the intrinsic factors such as the constituent and the restoration materials, as well as on the external factors such as the microclimate parameters of the environment in which the panel painting is located.

As the painting presented diffuse lifting of paint along the grain of the wood as well as warping of the painted surface it was decided to carry out an environmental survey. To characterize the environmental conditions of the Chapel a continuous monitoring system measuring the temperature and the relative humidity of the air and the surface temperature of the panel painting was realized.

From the results obtained it can be observed that during the period considered the relative humidity values are in the range between 35 and 60 %, with a 5% of fluctuaction during the switch off of the heating system, while when the heating system was working relative humidity fluctuactions were much higher. In particular during Christmas time, relative humidity **range** increased up to 30% in a very short period of time, about two hours. During the same period temperature **variability** was between 3 and 5-6 °C.

When the ambient relative humidity falls, the equilibrium moisture content of wood drops and the wood shrinks with important resulting deformations. Vice-versa the wood will swell with increasing relative humidity. For practical purposes, the relationship between deformation and equilibrium moisture content may be assumed to vary linear. It is of critical importance to recognize that free-swelling dimensional changes are stress-free strains. It is only when under restraint that hygroscopic materials subjected to relative humidity changes develop stress-associated strains.

Two types of wood are present in the Giorgione's panel painting: wooden panels are poplar-based while reinforcement of the reverse panel are mahogany-based. The temperature and relative humidity fluctuactions in a panel painting under restraint cause differential mechanical strains according to the different wood materials as well as the painted layer materials.

During the year the slow changes of temperature and relative humidity has a negligible influence on the inside environment and consequently very modest strains and deformations on the panel painting occurred.

On the contrary, in winter, the strong and sudden changes **in** relative humidity and temperature due to the switch on of the heating system during week-end caused differential strains on the two different woods, poplar and mahogany, as well as on the painted layer of the Giorgione's panel painting.