

Microclimate frames to protect panel painting effectively

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Microclimate frames presently are used for storage paintings exhibited in less-than-ideal environments. Simple and economical construction of microclimate frames was developed and tested.

Construction of MC-frame:

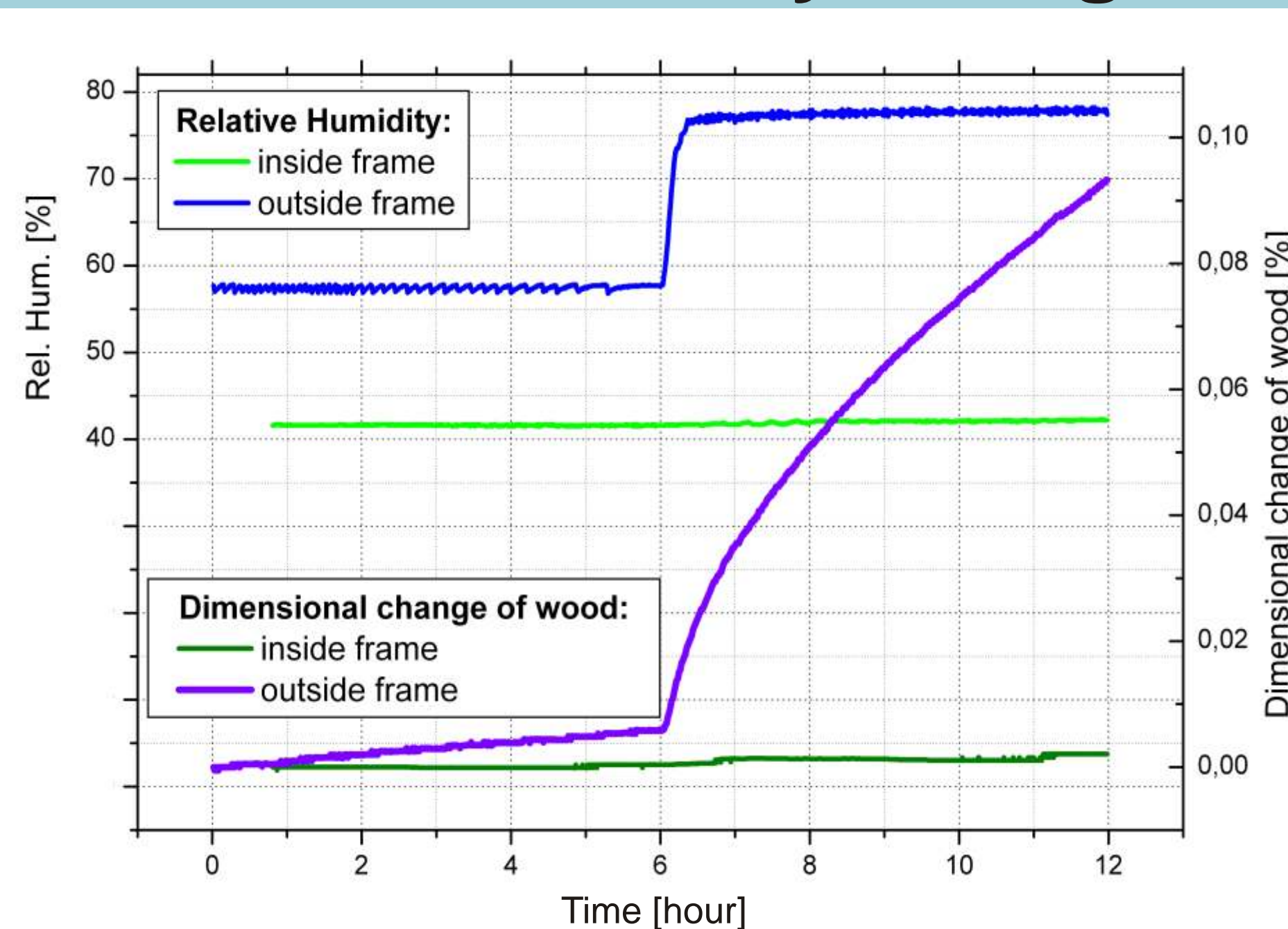
- wooden frame
- non reflex glass
- aluminium foil isolate
- polycarbon backplate

The test frame with a wood panel has been examined in extreme temperature and relative humidity conditions in a climate chamber in the laboratory.



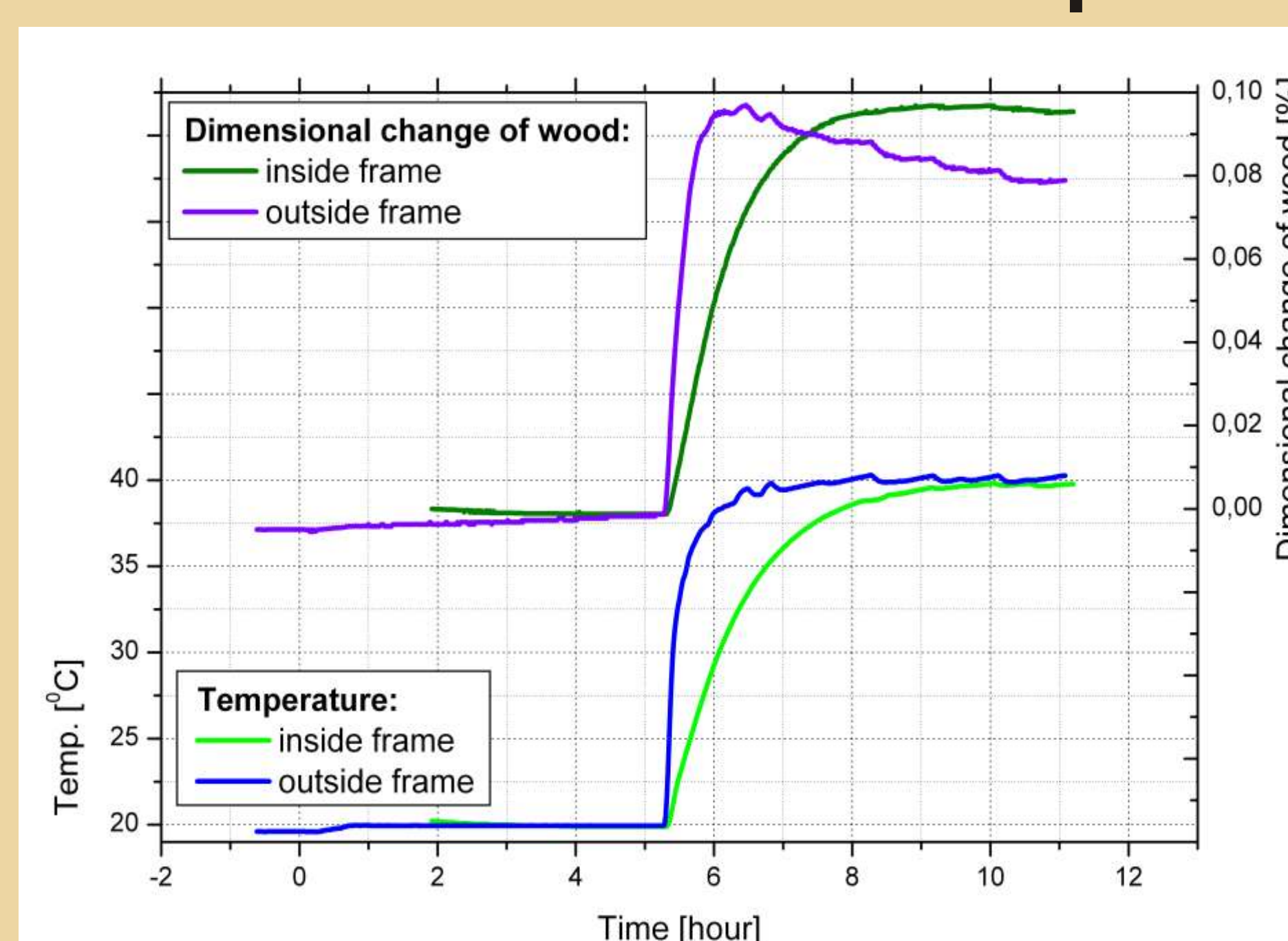
Differences in the behaviour of panel paintings inside and outside microclimate frames

Relative Humidity changes



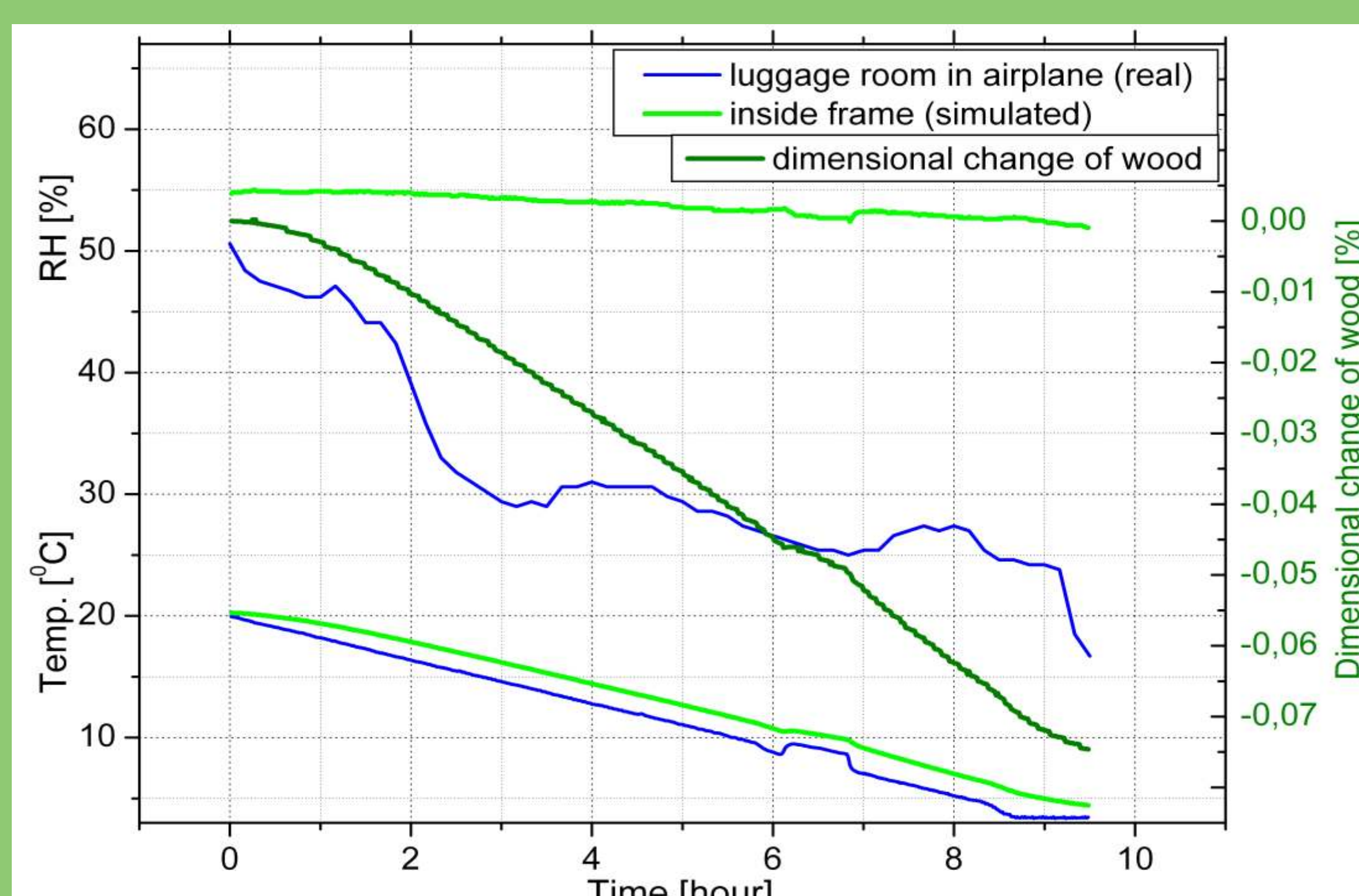
Even during dramatic RH changes (20%) the RH and the wood panel (lime wood) inside the frame have been almost stable. The same wood panel without protect of MC-frame responded dramatically.

Temperature changes



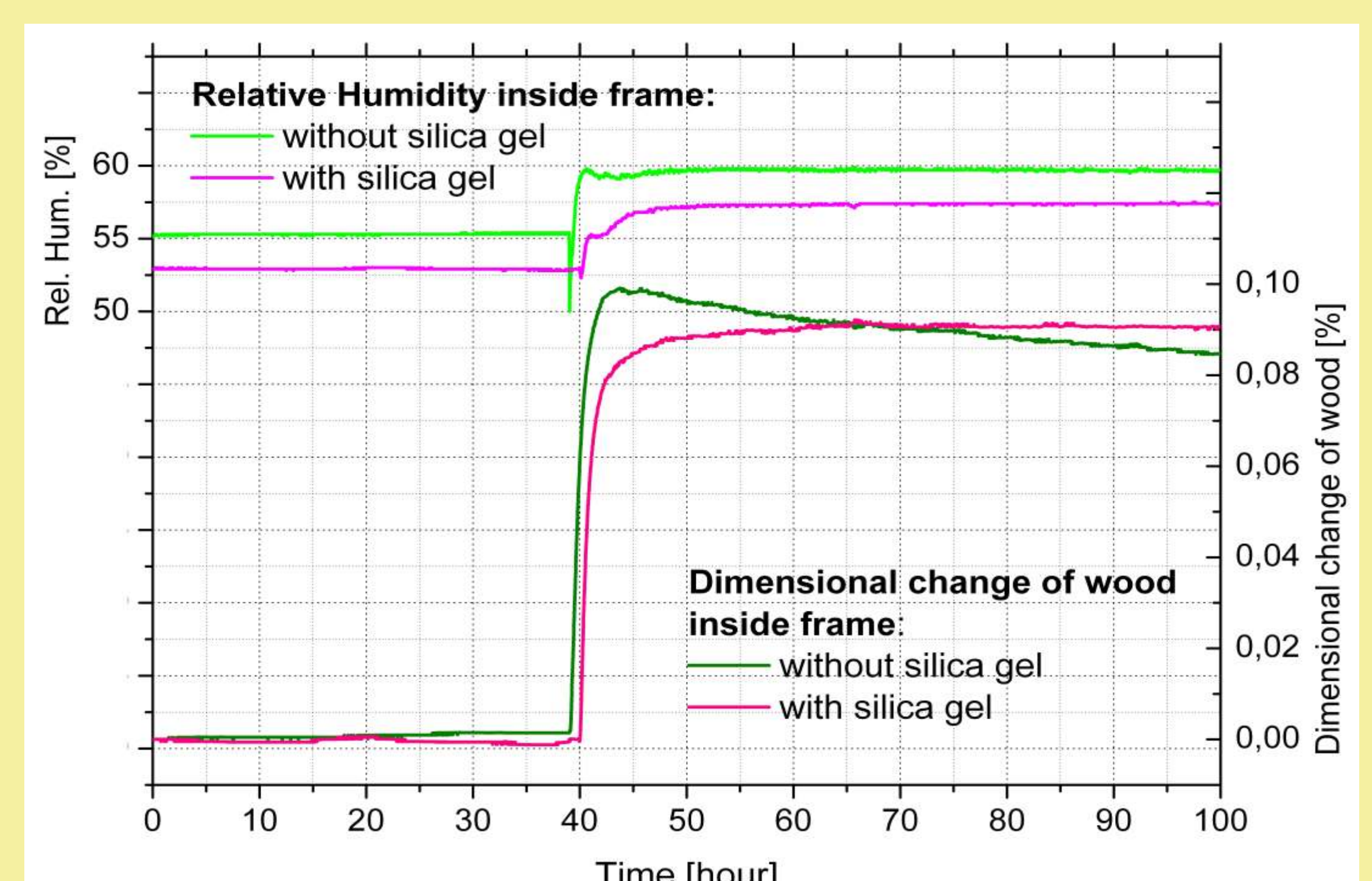
Sudden temperature changes (of 20° C), which do not happen frequently in real life situations, have little influence on the inside conditions and on the object. The protect of even sudden short-term temperature changes by MC-frame was observed. Mechanism of temperature expansion was dominated over desorption of water from wood during increase temperature.

Behaviour of panel paintings inside MC-frame during airplane transport



Changes of microclimate parameters during transport by aircraft were modeled in climate chamber. Similar a satisfying stabilizing effect of the MC-frame was observed.

Evaluation of application silica gel inside MC-frame



Influence of silica gel on microclimate conditions and wood panel in MC-frames was investigated. No significant differences between cases with and without silica gel was observed.