

## NANOINDENTATION TESTING CONDITIONS – CONTROLLING TEMPERATURE AND HUMIDITY?

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Nanoindentation testing is mostly used under room temperature ambient conditions. The usable range of testing has been increased to high and very high temperatures to study metals and ceramics under these conditions. On the other hand there are many materials, which change properties already around room temperature. This is particularly relevant for low T<sub>g</sub> polymers or soft materials in life-science.

In order to regulate the temperature of the sample during testing, a carefully designed heating and cooling equipment is required to maintain a low noise level.

We present concepts and results of our Heating-Cooling stage, which can be tempered in the range from -40°C to +180°.

To control the humidity above and around the sample may also be crucial for sensitive materials.

We recently developed a humidity controller, which can used together with a sample temperature controller.

A small enclosed volume around the sample is purged with humidified gas/air of the selected relative humidity.

The level of relative humidity can be controlled from 0% to 95% RH using a precise humidity sensor in the proximity of the sample.

Results from different applications are presented in order to discuss technical and scientific aspects with the community.