Micro Materials
Excellence in Nanomechanics

Humidity Cell

Humidity Cell module with the NanoTest Vantage

The properties of many materials can vary significantly with changes to humidity. This can be especially true of polymeric or biological samples. Obtaining meaningful test results for prediction of true-life performance is better achieved by closely mimicking service conditions. The Humidity Cell can assist considerably in achieving this.

How it works

Important features of humidity cell experiments with the NanoTest Vantage

The humidity cell utilises a small external steam generator linked to a controller to provide the required humidity in the test cell. An in-line desiccant is also present to pre-dry the air prior to controlled steam addition. A full range of humidity from 10% to 90% is therefore possible, irrespective of ambient room conditions.

- **Fully programmable experimental conditions**: The humidity cell has its own controller allowing simple set point and display of relative humidity (RH).
- **Chamber design**: The humidity cell is designed to be small enough to allow rapid attainment of set point, whist also being able to accommodate the sample and indenter.
- **Test versatility**: The cell allows a full range of tests to be performed on samples under controlled humidity. These include indentation, scratch and high strain rate impact..

Figure 1: the Humidity Cell on the NanoTest

Effects of changing humidity on polymeric sample

Nanocomposite with 20% clay

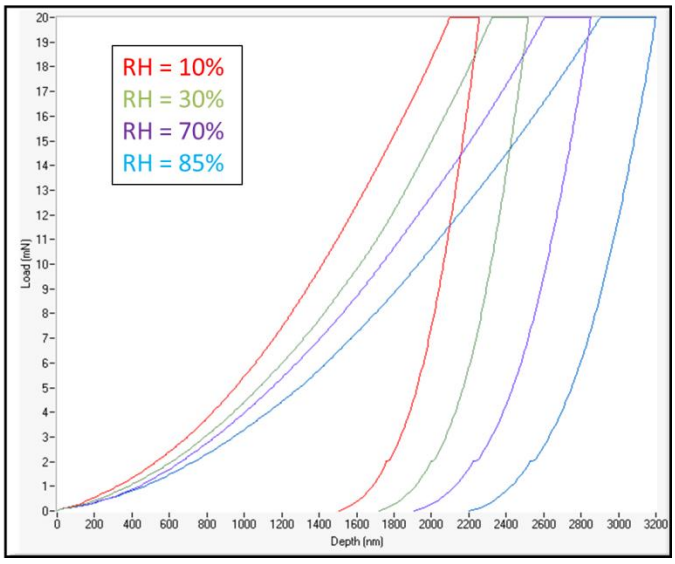

Figure 2 shows the change in mechanical properties of a nanocomposite/polymer sample tested under increasing RH.

The results shown in Figure 2 demonstrate the effect varying humidity can have on the properties of polymeric materials. Given the changes, it becomes more vital to test materials as close to their proposed service conditions as possible.

In this example, the hardness of the material is significantly lowered with increasing humidity, an effect that may be missed without thorough, relevant testing.

The Humidity Cell from Micro Materials allows data to be gathered for true assessment of properties at both high and low humidity.

Change in Relative Elastic Modulus with increasing RH

Figure 3

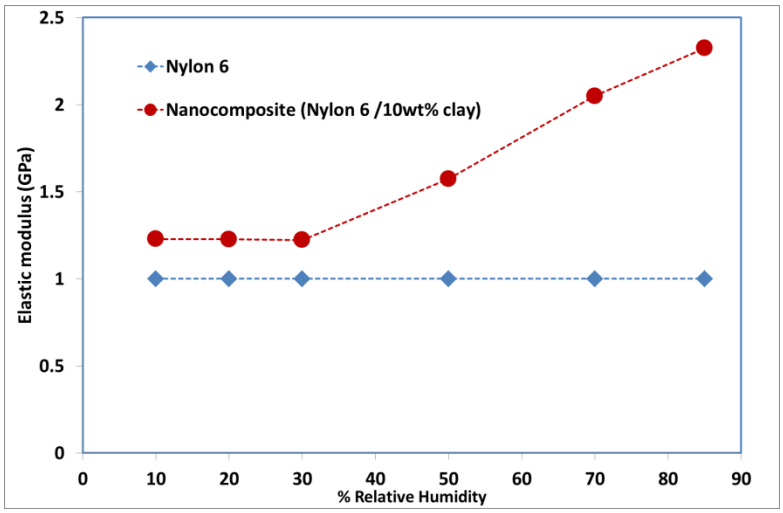

Figure 3 shows

- Simple set up for new instruments or as an upgrade
- Rapid control of humidity from 10% RH to 90% RH
- Desiccant drying and steam humidification provide consistent RH to be held irrespective of ambient conditions
- Full range of tests possible within the Humidity Cell, including indentation, scratch and impact

Local MML Representative