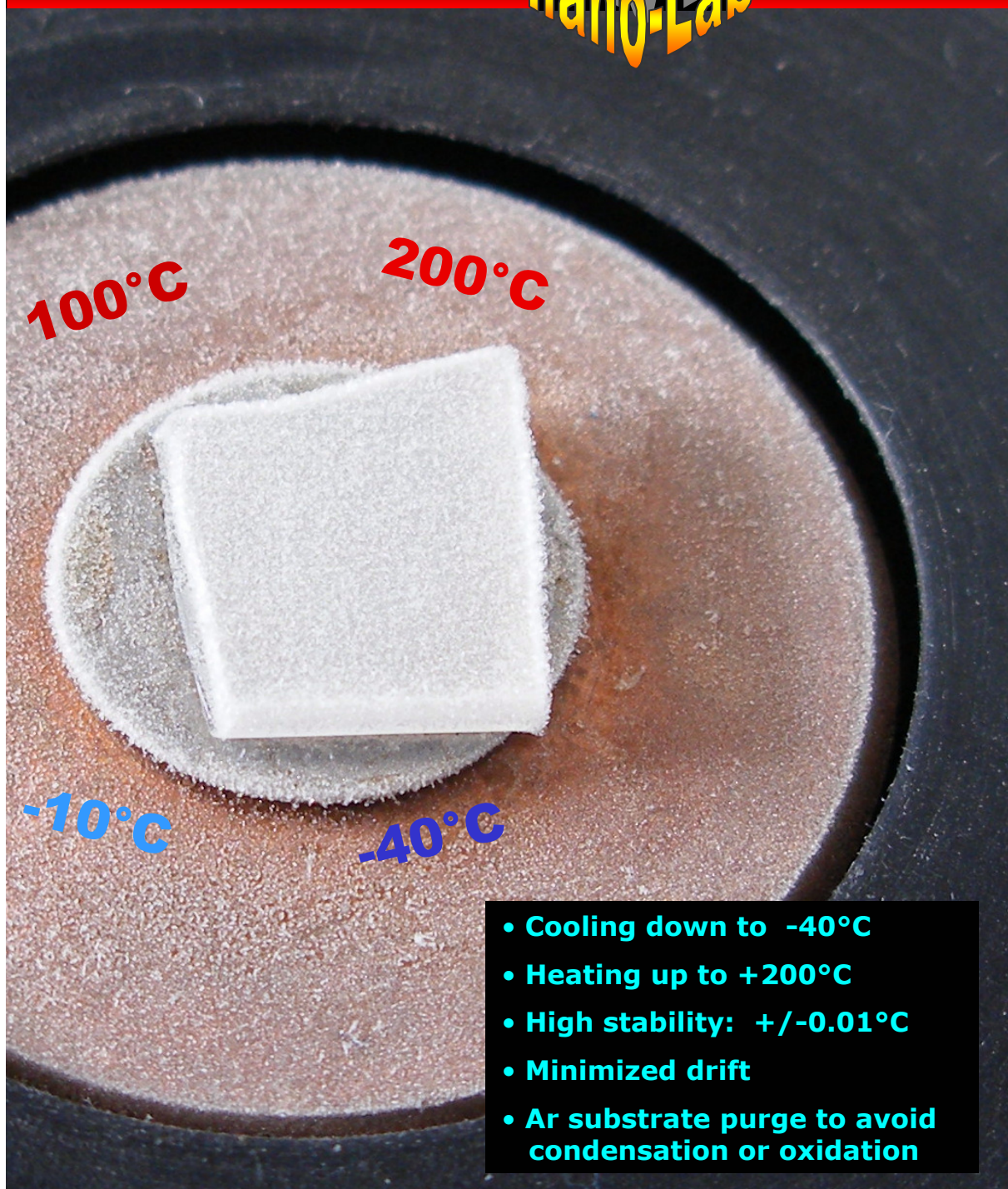


nano-Labtools
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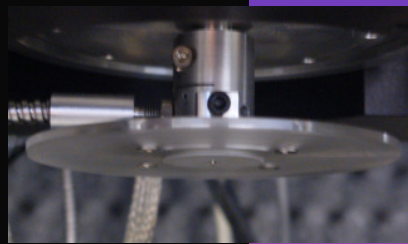
Heating / Cooling for Agilent/MTS XP/G200

Heating and Cooling for Nanoindentation

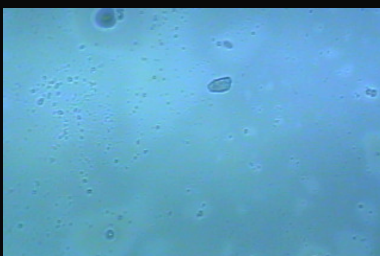
Mechanical properties frequently are very sensitive to temperature changes. This leads to the necessity to determine the mechanical properties of samples depending on the temperature. For some areas of materials science the temperature range of interest also includes temperatures below 0°C.

To facilitate nanoindentation measurements under these conditions, SURFACE has developed a flexible heating / cooling system which covers a temperature range of -40°C to +200°C.

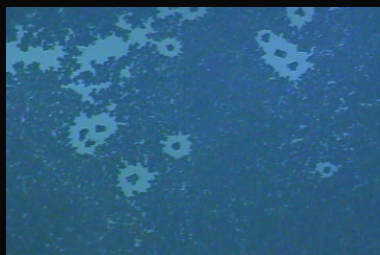
The sample holder is compatible to the standard sample tray of the MTS/Agilent XP or G200 nanoindenter. The system can be used under the XP head. The system includes a polycarbonate-based cover plate, which is mounted directly to the center tube of the XP head. The cover plate is made of two items: one big plate, covering the complete sample tray, and a smaller center plate, which will be adjusted to give the tip a secure parking position.



The Mini Enclosure



Sample at -31°C, inert gas purge



Sample at -31°C, inert gas 2 sec. off

When cooling a sample below the dewpoint of the ambient air it is essential to avoid condensation and ice formation on the substrate surface.

For this reason the SURFACE heating / cooling stage is designed to form a small but flexible environmental chamber around the substrate, which can always be purged with dry gas.

The setup is built with a flexible wall around the heating / cooling table. Together with the indenter head cover plate this allows to hold the substrate under dry inert gas to avoid condensation at low and oxidation at higher temperatures.

The effectiveness of the system is shown in the two photographs on the left.

Bio Option:

The system can be delivered as a temperature controlled liquid cell.

The temperature stability lies within $\pm 0.01^\circ\text{C}$, excellently suitable for biological and medical applications.



Specifications:

MTS XP/G200 compatible sample tray

Sample stage:	max. 25 mm diameter
Heating:	max. 200°C *)
Cooling:	max. -40°C *)
Temperature stability:	$\pm 0.01^\circ\text{C}$
Temperature sensor:	external Pt 100, built into the sample stage internal Pt 100, built into the bath
Controller:	self optimizing PID loop
Interface:	RS 232

Bath volume:	8 l
Pump:	22-26 l/min, 700/400 mbar
Tube length:	2 meter

Electrical power: 230 VAC, 2000 W
*) depending of the used heating/cooling liquid

Applications

- Polymer research
- Biological research
- Medical research
- Construction material research

SURFACE

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