nano-Labtools
nano-Lab

50mm

200mm

30mm

SURFACE
## always one step ahead

Nanoindentation over a large area

Nanoindentation as a quality tool for real wafers demand, that the frame stiffness of the instrument across a large area is as constant as possible. Only a proper design and a well tuned system allows to fulfill this demand. The graphs on the right are showing such measurements across an area of approx. 100x100 mm.

It is important to know, that the vacuum generating holes below the wafer do not effect the local stiffness.

If smaller samples than full 200mm wafers are to be tested on the Vacuum Chuck, it is necessary to cover the remaining holes around the substrate in the top plate. Otherwise the vacuum level below the substrate is too low to fix it. A flexible foil is a good solution for such cover. Very important is the bottom flatness of each substrate to achieve the best vacuum. Because each substrate is only supported from a flat aluminum surface, this chuck is not usable for standard small substrates which could be measured with the standard sample tray.
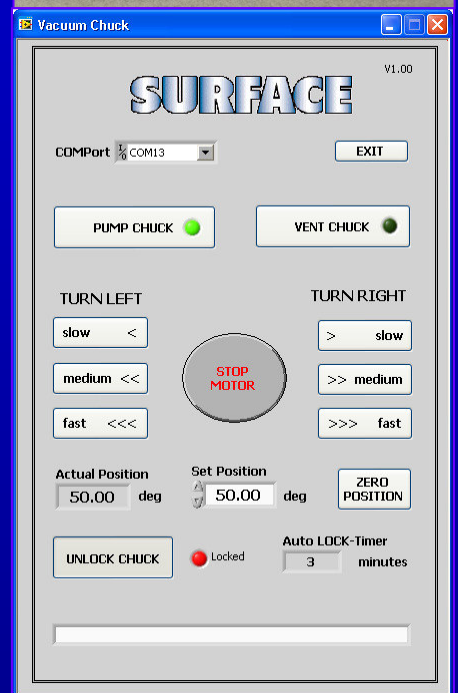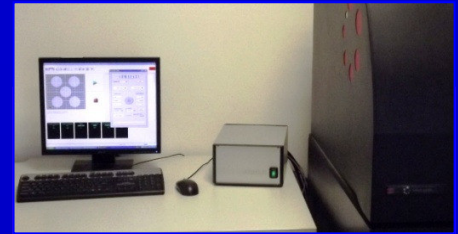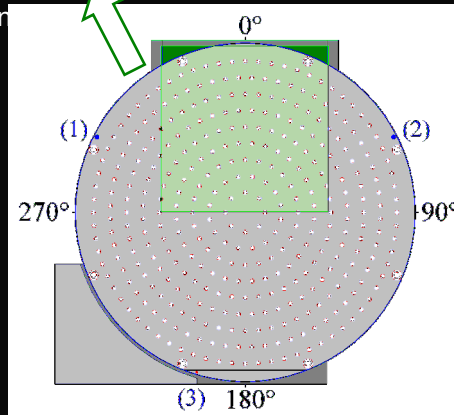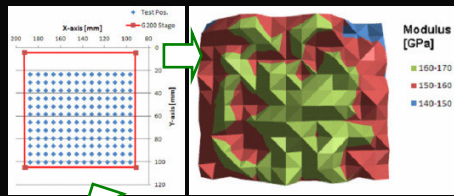
The components of the vacuum chuck system

The upper pictures of the side bar show the placement of the chuck controller either as desktop or integrated into the G200 rack. The vacuum pump and the necessary cabels and pipes to run the vacuum chuck are pictured at the bottom of the side bar. The vacuum chuck is fixed onto the dovetail rails of the standard sample tray on the G200 x/y stage. A stepper motor drives via a tooth belt the wafer plate +/-180° with a resolution of better than 0,2°. The detail of the wafer will be choosen under the microscope in the same way as any sample.

The chuck control software

The small software frame shown at the side bar is the only necessary interface to run and control the chuck. The chuck controller is connected via USB to the G200 contol PC and the software frame can be handled interactive together with the nanoSuite from the indenter.
The motor can be driven with different speeds in both directions or directly to a dedicated angular position always relative to a zero position.
All vacuum related actions with the wafer - pump or vent - are also controlled from this screen. For loading/unloading of samples the stage drives to the front position. The loading can be done through the loading door of the G200.

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Specifications:

Compatibel with the G200 sample tray

Stage:	full 8" wafer size or smaller sizes with cover foil 360° rotation
Software:	USB interface Labview user interface
Controller:	table top case with interface to all components
Vacuum pump:	diaphragm pump 1 m³/h
Electrical power:	230 VAC