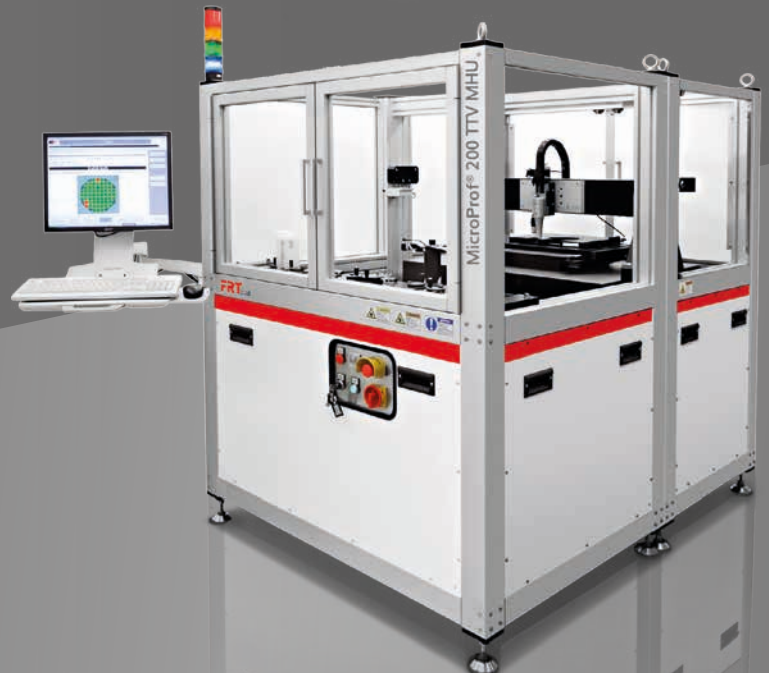
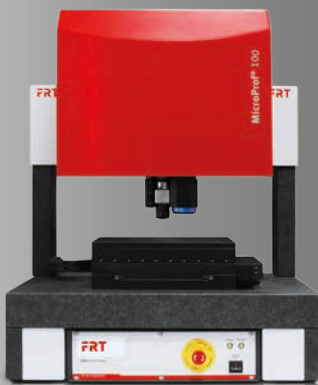


3D SURFACE METROLOGY
SYSTEMS FOR RESEARCH
AND PRODUCTION

FRT
THE ART OF
METROLOGY™

The MicroProf® - Series

Non-contact and non-destructive measurement of
roughness, profiles, topography and film thickness





<p>POINT SENSORS</p> <ul style="list-style-type: none"> > extremely flexible > any scan range > fast on large areas 		<p>FIELD OF VIEW SENSORS</p> <ul style="list-style-type: none"> > highest resolution > large areas via stitching > fast on small areas
<p>ATOMIC FORCE MICROSCOPY</p> <ul style="list-style-type: none"> > nm resolution > large scan area > easy handling 		<p>FILM THICKNESS SENSORS</p> <ul style="list-style-type: none"> > highest resolution > large measurement range > measurement of multi layers

THE MICROPROF® – ONE SURFACE METROLOGY TOOL FOR ALL MEASURING TASKS

MAXIMUM FLEXIBILITY THANKS TO MULTI-SENSOR TECHNOLOGY

The **MicroProf®** from FRT makes it easy to perform diverse measurement tasks quickly, efficiently and intuitively. As an established standard measuring system in modern 3D surface metrology, the **MicroProf®** has been impressing our customers in the semiconductor, medical and automotive industries for many years. Whether you want to measure the topography, thickness or film thickness of your samples contactfree, the versatile **MicroProf®** can be used universally thanks to proven optical FRT multi-sensor technology. Different optical measurement methods which are only available elsewhere as individual solutions have been combined into an universal, space-saving device.

Depending on your requirements, the **MicroProf®** enables you to perform quick overview measurements of the entire sample as well as high-resolution detailed measurements. This is made possible thanks to the various combinations of the measuring sensors. In addition, FRT's proprietary software can be configured individually and your measurement tasks implemented either manually or automatically.

Retain flexibility for your future sample measurements and upgrade sensors easily and quickly as required, saving space, time and (not least) expense.

SUITABLE FOR ANY SAMPLE SIZE

The **MicroProf®** universal surface metrology tool is available in different versions. Depending on the size of the samples to be measured, you can choose the system which provides the appropriate sample holder and travel distance. In addition to the **MicroProf® 100** tabletop unit, there are two larger models, **MicroProf® 200** and **MicroProf® 300** which are standalone systems. For these two variants, the Material Handling Unit (MHU) is also available. From manual measurement and evaluation through to fully automated execution of sample handling, measurement and evaluation, you can determine the degree of automation yourself. Select the appropriate software and hardware components.



	MicroProf® 100	MicroProf® 200	MicroProf® 300
xy-Travel	150 mm x 100 mm	250 mm x 200 mm	415 mm x 305 mm
Multi-Sensor	X	X	X
TTV-Option	X	X	X
Tabletop Unit	X		
Standalone		X	X
Automation (optional)	X	X	X
Sample handling (optional)		X	X
Thermo Unit (optional)	X	X	X

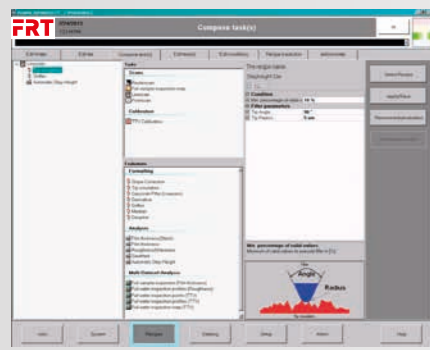
MEASURING TASKS

Topography	Roughness	Film Thickness / Layer Stacks	3D Map	Profiles
Thickness	TTV	Bumps	Co-planarity	Vias / TSV
Trenches	Bow	Warp	Waviness	Flatness
Geometry	Slope	Radius of Curvature	Angle	Parallelism
Thermal Load	Membrane Bow	Stress	Overlay	Critical Dimension
Saw Marks	Roll-off Amount	Defect Size	Grain Size	Nanotopography
...				

BOTH SIDES CONSIDERED

Both the tabletop unit and the standalone systems in the **MicroProf®** series include the option for two-sided sample inspection (TTV option). This enables you to measure the top and bottom of your sample simultaneously and determine the sample thickness during the same measurement process. The thickness variation (TTV – total thickness variation) of the sample can be determined along with surface parameters, e.g. the roughness, waviness and flatness of both surfaces or the parallelism of the two sides. The TTV option can be easily retrofitted at your site.

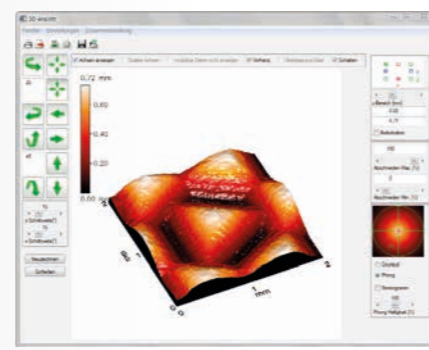




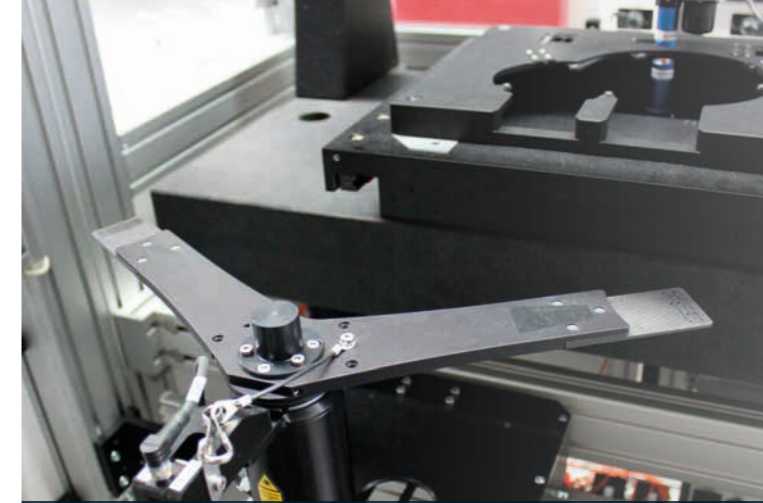
Recipe creation – process definition:
FRT Acquire Automation XT



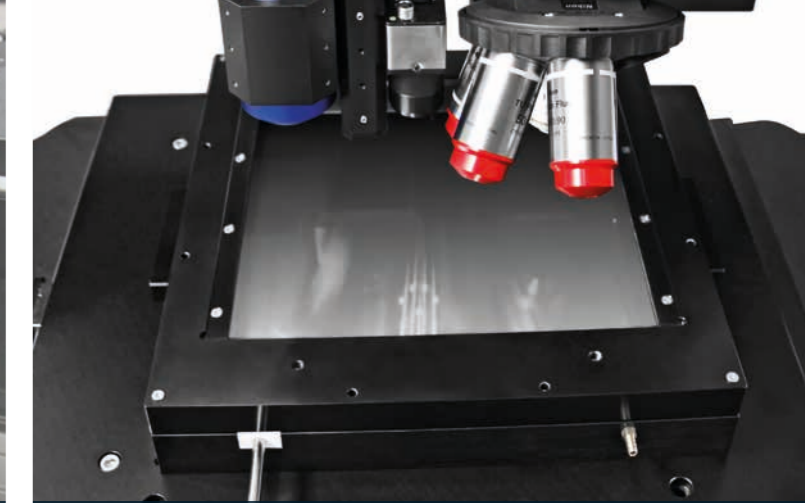
Automated measurement process
sequence: FRT Acquire Automation XT



3D view of a measurement FRT Mark III



MHU – MATERIAL HANDLING UNIT



THERMO UNIT

SOFTWARE MADE BY FRT

INTUITIVE MEASUREMENT – FRT ACQUIRE

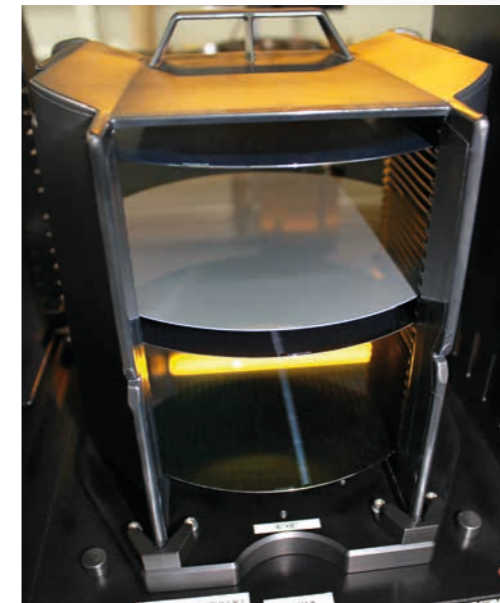
In simple steps, the FRT **Acquire** software walks you through manual measurements, from switching the device on to execution of the measurement process. FRT Acquire's structured user guidance enables you to easily perform manual measurements of all kinds. All sensors in use on your **MicroProf®** can be controlled via the software's user interface. Whether point, profile or 3D measurements are needed, simply set the optimum measurement parameters for your application, monitor them via the intuitive live display and easily save your measured data subsequently.

COMPREHENSIVE EVALUATION – FRT MARK III

The FRT **Mark III** analysis software provides a comprehensive package for the processing, evaluation and presentation of your 2D or 3D measurements. The latest standards are implemented, including roughness and waviness calculation, as well as many processing and filter functions. Choose the appropriate analysis functions for your application from the wide range of options, including roughness, flatness, step height, film thickness and many more. Present your results in 3D, as a profile view or top view, and design your own measurement protocols. This user-friendly software also contains diverse import and export capabilities and can automatically execute multiple processing and evaluation steps in your measurement series.

AUTOMATED MEASUREMENT AND EVALUATION – FRT ACQUIRE AUTOMATION XT

Fully automated execution and evaluation of measurements is possible with the recipe-based software FRT **Acquire Automation XT**. This software provides comprehensive capabilities, from manual measurement on the device to fully automated measurement with one-button operation and integration into production control systems, e.g. via a SECS/GEM interface. Choose the suitable measurement and evaluation routine for your measuring task from a variety of packages. For recurring structures, a layout wizard with a graphical user interface (GUI) can support you in learning the measuring positions. In addition, fine sample alignment via pattern recognition is available as an option. You can easily configure various measurement tasks using different sensors to run consecutively as a measurement sequence. This includes the execution of measurements, processing and analysis using intelligent algorithms, output and visualization of results in the form of reports and the export of results in various data formats. The current DIN-EN-ISO and industry-specific standards such as SEMI are complied with as a matter of course. With its SEMI-compliant user interface, the FRT **Acquire Automation XT** satisfies all requirements for use both in production and the laboratory. And naturally, the software contains user administration functions including assignment of individual user rights.

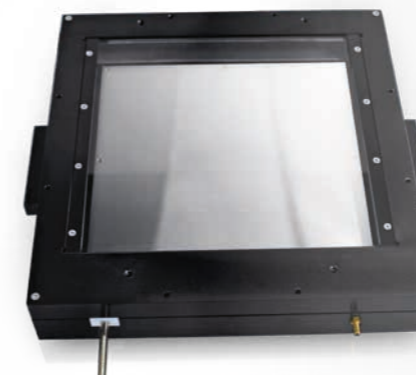


SAMPLE HANDLING

In many industries, it is necessary to connect high sample throughput rates to automated measurement processes. For this purpose, automatic handling of samples is required.

The MHU option for the semiconductor, MEMS and LED industries enables fully automatic measurements of different samples (wafers) to be easily achieved. From up to 4 cassettes, the **MicroProf®** analyzes (e.g.) wafers with a diameter of 2 to 12 inches with full integration in the production workflow and full automation. Optionally, the MHU fitted to the **MicroProf®** can be equipped for sample sorting according to desired criteria.

Other systems for sample handling, e.g. SCARA robots, can also be integrated.

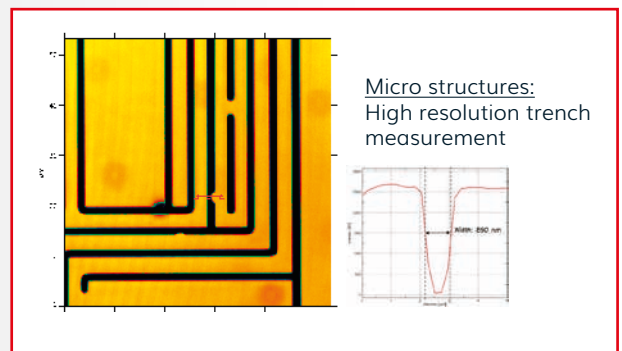
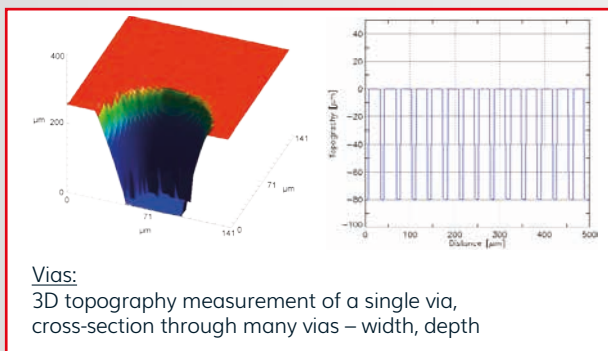
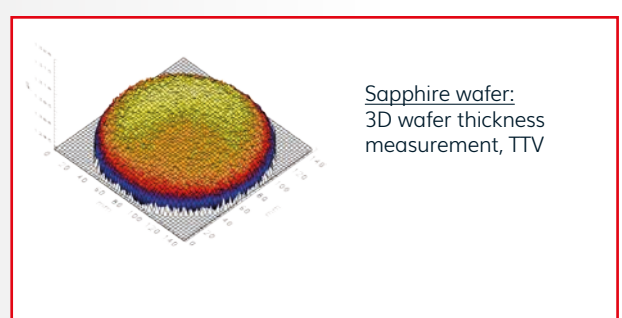
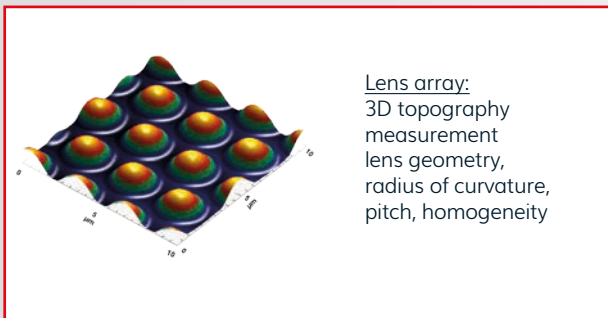
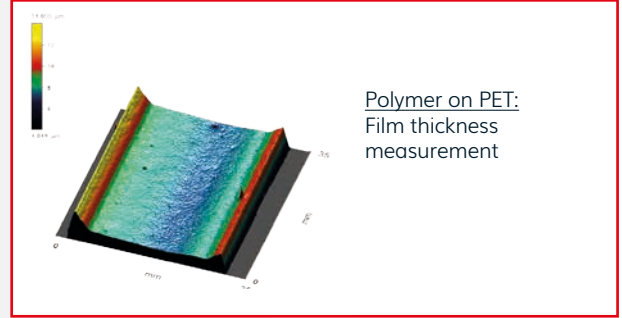
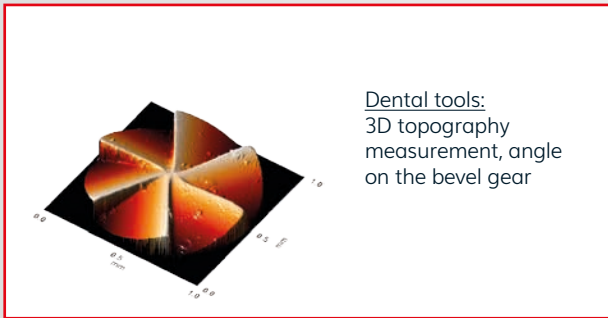
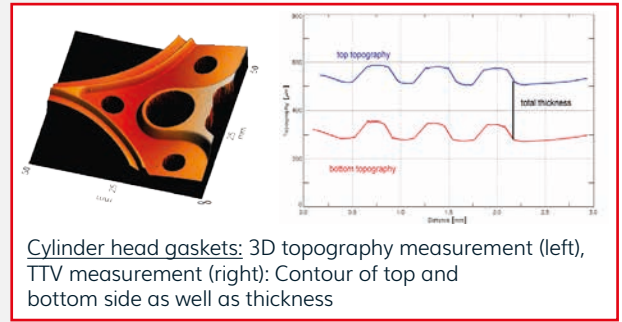
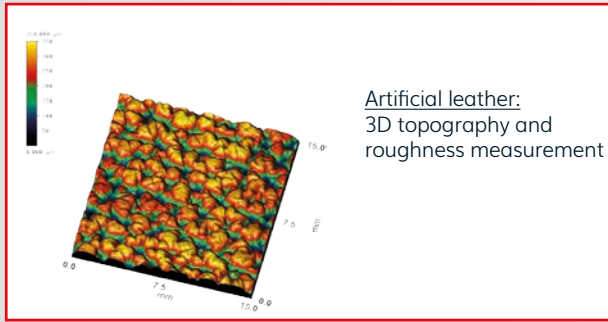


SURFACE MEASUREMENTS UNDER TEMPERATURE INFLUENCE

Changes to components due to thermal stress can lead to functional impairments or even failures. The topographical assessment of samples under thermal load is critical, e.g. in the areas of electronic components and material technology.

By adding the thermo unit to the **MicroProf®**, you can perform measurements of the surface topography of components under controlled thermal stress. To do this, the samples to be measured are placed on a heating and cooling plate within a closed chamber (glass cover) and heated. The sample temperature can be precisely adjusted and varied using individually configurable temperature profiles. Both fully automatic measurements of surface topography at different temperatures and dwell times at constant temperatures are fully adjustable. The thermo unit is available as an extension for all FRT measuring devices and is mounted as a separate module just like an ordinary sample holder.

MEASURING EXAMPLES:



Questions? Talk to an expert!

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FRT partners: