MEASURING EXAMPLES

SURFACE MEASUREMENTS UNDER TEMPERATURE INFLUENCE

Under thermal load, components change or deform, resulting in malfunctions or even breakdowns. Therefore the topographical evaluation of the samples is indispensable in electronic engineering and materials technology. With the MicroProf® TL, you can measure the surface topography of different components under controlled thermal load. For this purpose, the samples are placed on a heating and cooling plate in a closed chamber (glass cover) and heated or cooled. The sample temperature can be precisely adjusted and varied with individually configurable temperature profiles. Both fully automatic measurements of the surface topography at different temperatures and dwell times at constant temperatures are adjustable. The thermo unit is available as an extension for all FRT tools and is mounted as a separate module.
ONE TOOL FOR ALL MEASURING TASKS

MULTI-SENSOR TECHNOLOGY CREATES MAXIMUM FLEXIBILITY

In modern 3D surface metrology, the MicroProf® by FRT is established as the standard measuring tool. Depending on the requirements, the MicroProf® enables a fast overview measurement of the entire sample as well as high-resolution detail measurements. This is made possible by the combination of point, line, surface and thickness sensors, as well as scanning force microscopy. The measuring ranges can vary from meters to sub-nanometers.

The MicroProf® is a high-precision measuring tool that can be flexibly retrofitted and is also space-saving. With the multi-sensor technology developed by FRT, different optical measuring methods can be combined in one tool.

**Suitable for any sample size—whether small or large**

The measuring system can be provided in different versions. Depending on the sample size, the sample holder and the travel range are configured.

The smallest version is the MicroProf® 100, a table-top tool. Two larger stand-alone systems, the MicroProf® 200 and MicroProf® 300, offer, after the mainly in the travel range size. The Material Handling Unit (MHU) is also available for these two systems. From manual measurement and evaluation to fully automatic execution with sample handling, you can determine the degree of automation yourself.

An overview of the corresponding software and hardware components follows.

**Consideration of both sides of the sample from above and below**

With the TTV option, double-sided sample testing is possible. The upper and lower sides of the sample can be measured during the same measuring procedure. All output of the total thickness variation (TTV) and other sample parameters such as roughness, waviness, flatness of both surfaces or the parallelism of both sides is possible. The TTV option can be easily retrofitted.

**Intuitive User Guidance — Acquire Automation XT**

In simple steps, the FRT software Acquire guides you through manual measurements, from switching on the tool to executing the measuring process. With the structured user guidance, you can easily perform all kinds of manual measurements. All sensors used can be controlled via the software user interface. Whether point, profile or 3D measurements. Set the optimal measurement parameters, monitor them with the intuitive live display and save your measurement data afterwards.

**Software Made by FRT**

The fully automatic execution and evaluation of the measurements is possible with the recipe-based FRT software Acquire Automation XT. This software offers comprehensive possibilities, from manual to fully automatic measurement in one-button operation and the integration into production control systems, e.g. via a SECS/GEM interface.

Select from a variety of packages the suitable measuring and evaluation routine for your measuring task. For recurring structures, a layout assistant can support you in learning the measuring positions with a graphical user interface GUI. Optionally, an exact sample alignment via pattern recognition is also possible. You can configure different measurement series with different sensors to run them one after the other as a measurement sequence. This includes performing measurements, processing and analyzing with intelligent algorithms, outputting and visualizing results in the form of reports, and exporting results in different data formats. Of course, the current DIN-EN-ISO and industry-specific standards such as ETV are adhered to. With its XEMA compatible user interface, Acquire Automation XT meets all requirements for use in production and laboratories. And, of course, the software includes user administration functions including the assignment of individual user rights.

**Comprehensive Analysis — Mark III**

The Mark III analysis software developed by FRT offers a comprehensive package for processing, evaluating and presenting your 2D or 3D measurements. The latest standards, including the calculation of roughness and waviness, as well as many filtering and processing functions are implemented. Choose the right analysis functions for your application from a wide range of options, e.g. flatness, step height, layer thickness and many more. Present your results in 3D, profile view or top view and design your own measurement reports. This user-friendly software also includes various import and export functions and can automatically perform several processing and evaluation steps in one measurement series.

**Automatic Measurement and Evaluation — Acquire Automation XT**

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MULTI-SENSOR TECHNOLOGY CREATES MAXIMUM FLEXIBILITY

In modern 3D surface metrology, the MicroProf® by FRT is established as the standard measuring tool. It can be used to perform a wide range of measurement tasks quickly, efficiently and intuitively.

The MicroProf® has been used for many years in the semiconductor, microelectronics, medical and automotive industries. Topography, step height, roughness, layer thickness and other parameters can be measured contactlessly and non-destructively.

With the multi-sensor technology developed by FRT, different optical measuring methods can be combined in one tool. Depending on the requirements, the MicroProf® enables a fast overview measurement of the entire sample as well as a high-resolution detail measurements - this is made possible by the combination of point, line, surface and layer thickness sensor, as well as scanning force microscopy. The measuring ranges can vary from meters to sub-nanometers.

Depending on the sample size, the sample holder and the travel range are configured. The smallest version is the MicroProf® 100, a tabletop tool. Two larger stand-alone systems, the MicroProf® 200 and MicroProf® 300, offer mainly in the travel range size. The Material Handling Unit (MHU) is also available for these two systems. From manual measurement and evaluation to fully automatic execution with sample handling, you can determine the degree of automation yourself. An overview of the corresponding software and hardware components follows.

CONSIDERATION OF BOTH SIDES OF THE SAMPLE FROM ABOVE AND BELOW

With the TVI option, double-sided sample testing is possible. The upper and lower sides of the sample can be measured during the same measurement procedure and the sample thickness can be determined, too. The output of the total thickness variation (TVI) and other surface parameters such as roughness, waviness, flatness of both surfaces or the parallelism of both sides is possible. The TVI option can be easily retrofitted.

Suitable for any sample size - whether small or large

The measuring system can be provided in different versions. Depending on the sample size, the sample holder and the travel range are configured. The smallest version is the MicroProf® 100, a tabletop tool. Two larger stand-alone systems, the MicroProf® 200 and MicroProf® 300, offer mainly in the travel range size. The Material Handling Unit (MHU) is also available for these two systems. From manual measurement and evaluation to fully automatic execution with sample handling, you can determine the degree of automation yourself. An overview of the corresponding software and hardware components follows.

SOFTWARE MADE BY FRT

INTUITIVE USER GUIDANCE – ACQUIRE AUTOMATION XT

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COMPREHENSIVE ANALYSIS – MARK III

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AUTOMATIC MEASUREMENT AND EVALUATION – ACQUIRE AUTOMATION XT

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With the TTV option, double-sided sample testing is possible. The upper and lower sides of the sample can be measured during the same measuring procedure and the sample thickness can be determined locally. The output of the total thickness variation (TTV) and other surface parameters such as roughness, waviness, flatness of both surfaces or the parallelism of both sides is possible. The TTV option can be easily retrofitted.

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SOFTWARE MADE BY FRT

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MEASURING TASKS

- Topography
- Roughness
- Film Thickness / Layer Stacks
- 3D Map
- Profiles
- Thickness
- TTV
- Bumps
- Capillarity
- Vias / TSV
- Trenches
- Bow
- Wornness
- Flatness
- Geometry
- Slope
- Root of Curvature
- Angle
- Porosity
- Thermal Load
- Membrane Bow
- Stress
- Overlap
- C-Radiation
- Size Marks
- Roll-off Amount
- Defect Size
- Grain Size
- Nanotopography

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**SAMPLE HANDLING**

The automatic sample handling enables high throughput rates even in automated measuring processes. Fully automated measurements are particularly in demand in the semiconductor, MEMS and LED industries. With the MicroProf® MHU, even fully automated measurements with different samples or wafers can be performed. From up to four cassettes, the MicroProf® MHU fully automatically analyzes wafers with a diameter of two to 12 inches with full integration into the production process. Optionally, the measuring system can be equipped for sample sorting according to desired criteria. Other systems for sample handling, e.g. SCARA robots can also be integrated.

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MATERIAL HANDLING UNIT (MHU)

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FRT reserves the right to change technical specifications. 03/2019

MEASURING EXAMPLES

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