

TTV Sensor Configuration

**Measuring Principle**

The FRT MicroProf® TTV tool is a metrology system for measuring the absolute thickness variation of wafers or similar products. Parts to max. 300 mm diameter can be measured with a resolution of 10 nm for the thickness measurement. Roughness and structures can be measured on both sides simultaneously.

The system has a frame configuration raster stage. Part fixturing supports the wafer only on the outer area. The sensors are vertically opposed, one above, the other below the sample. The lower sensor once adjusted, is stationary and in combination with the part fixturing, is set at the right measuring distance. The upper sensor, as in the standard metrology systems, is approached and retracted.

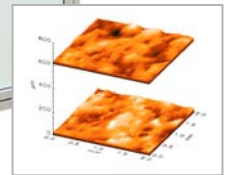
**Features**

- Non-destructive, optical TTV measurement
- Automatable measurements via recipe
- Pattern recognition routine
- Multisensor capability (e.g. AFM, film thickness...)
- Outstanding repeatability and reproducibility

**Scope of Delivery**

- Full housing
- Two chromatic sensors
- High-res, telecentric and illuminated CCD camera
- Precision x,y stage with open frame
- Rugged and stable granite mount
- Software, Industrial PC, TFT-Monitor, electronics, manuals

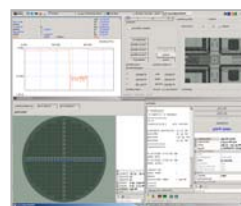
**High Resolution, Fast, Non-Contact Measurement of TTV, Roughness, Topography and Film Thickness**



Simultaneous measurement of the top and back of the wafer.

**Typical Applications**

- Total thickness variation (TTV)
- Roughness
- Step heights
- Pitch
- Trenches
- Bumps
- Bow
- Warpage
- Film thickness
- Measurement through tape possible!



Automation Software



Editor for measurement positions

**Hardware**

- Stage sizes: 420 x 310 / 250 x 200 mm<sup>2</sup> \*<sup>1</sup>
- Max resolution x,y: 1-2 µm
- Max. height range: 300 oder 600 µm \*<sup>2</sup>
- Max. part thickness: 45 mm \*<sup>1</sup>
- Max. TTV resolution: < 10 nm
- Max. resolution z: 3 nm
- Max. stage speed: 100mm/s

\*<sup>1</sup> Additional sizes/thicknesses upon request.

\*<sup>2</sup> Depending on sensor type. Optional AFM and film thickness sensors are available.



## Reference Customers

ASE Inc.  
Audi AG  
Ball Packaging Europe GmbH  
Bayer AG  
Beiersdorf AG  
BMW AG  
Boehringer Ingelheim microParts GmbH  
Carl Zeiss SMT AG  
DAIMLERCHRYSLER  
Dow Benelux N.V.  
EKO Stahl GmbH  
Fraunhofer-Institute  
Freescale  
Fuji Magnetics GmbH  
General Electric Plastics B.V.  
Gillette  
HILTI AG  
Hoechst Trespaphan GmbH  
Human Optics AG  
IBM  
Infineon Technologies AG  
Lexmark International, Inc.  
MAN Roland Druckmaschinen AG  
Matsushita Electric Works  
Nortel Networks Optical Components (Switzerland) AG  
Océ-Technologies B.V.  
Optische Werke G. Rodenstock GmbH  
Philips Electronics Nederland B.V.  
Robert Bosch GmbH  
Schott Glas  
SGL Carbon AG  
SIEMENS AG  
Sulzer Innotec AG  
Texas Instruments  
Universities  
Voestalpine Stahl GmbH  
Volkswagen AG  
Western Digital Fremont, Inc.

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