**Wafer Thickness**

**MPT1000 Non-Contact Thickness Measurement System**

The Complete Solution for Advanced Wafer Metrology

The Chapman MPT1000 utilizes a sophisticated dual non-contact measurement technology to measure such wafer geometry parameters as thickness, shape and flatness. The system is available in a fully automated, semi-automated and manual configuration. When equipped with the optional edge chip and crack module and the surface roughness module the MPT1000 is the most complete solution for advanced wafer metrology.

**Measurements**

- Wafer Thickness
- Total Thickness Variation (TTV)
- Bow
- Warp
- Tape Thickness
- Surface Roughness (Optional)
- Edge Chip and Edge Crack (Optional)

**Features**

- 3D mapping of thickness and shape
- Surface roughness module optional
- Edge inspection module optional
- Measures Si, Ge, InP, GaAs, Glass
- Bare, patterned and bumped wafers
- Wafers in Film Frame
- Available manual or automated

**Advantages**

- Non-contact full wafer scanning
- Measures independent of material
- Small laser spot size
- “All in one” system measurements
- Measures all tape configurations (clear or opaque)
- Superior accuracy and repeatability
- High Throughput
- Ability to measure different wafer thicknesses including wafers less than 100 um
Chapman Instruments non contact measurement system utilizes two focused laser beams, on the top and the bottom of the sample. The focus position of each beam is measured independently by using a confocal optical principle and an accurate positional response system. Both wafer surface and tape, or other material structures can be measured from the focused beam position at each surface interface.

The dual optical measurement system provides accurate wafer thickness measurements independent of material properties, especially useful for patterned wafers, bumped wafers, GaAs and other wafer types, after back grinding and dicing.

The patented dual laser configuration allows the system to measure any wafer configuration - bare, patterned or bumped - or wafer on tape (film frame) configuration - clear or opaque tape.

**Thickness Measurement Report 100 um Wafer**

The diagram on the left demonstrates the measurement system principal. The figure displays two beams, one focused on the top and the other on the bottom of the sample. The top beam is shown at two positions, one on the top of the tape and the other at the top of the wafer surface. The measurement is made by moving the focus position from the top of the tape to top of the wafer.

**Sample Wafer Configurations for Wafer Thickness Measurements**
With the available edge chip and crack module and the surface roughness module the MPT1000 becomes the complete solution for advanced wafer metrology.

The diagram on the left graphs the laser focused on a glass surface and the wafer surface. The difference in the “in-focus” locations equals the thickness of the glass.

With the available edge chip and crack module and the surface roughness module the MPT1000 becomes the complete solution for advanced wafer metrology.
### Measurement Specifications

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Accuracy²</th>
<th>0.15µm</th>
</tr>
</thead>
<tbody>
<tr>
<td>(ASTM F533)</td>
<td>Repeatability¹,³</td>
<td>0.10µm</td>
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<tr>
<td>Range</td>
<td>30µm-10mm</td>
<td></td>
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</tbody>
</table>

### System Specifications

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Manual, Semi or Auto</th>
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</thead>
<tbody>
<tr>
<td>Sensor</td>
<td>Dual Confocal</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1µm</td>
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<tr>
<td>Spatial Resolution</td>
<td>1.0µm</td>
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<tr>
<td>Safety</td>
<td>SEMI S2/S8</td>
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<tr>
<td>Laser System</td>
<td>CDRH Class 1</td>
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</tbody>
</table>

### Wafer Specifications

| Wafer Size | 50mm to 300mm |
| Wafer Mounting | Bare Wafer or Film Frame |
| Materials | Silicon, Sapphire, Gallium Arsenide, Glass |
| Surfaces | As cut, Lapped, Polished, Patterned, Bumped |
| Flat/Notch Conductivity | All Semi Standard P or N Type |

1 – Bare wafer 100 um 2 – Utilizing a NIST traceable device 3 – 1 sigma for 10 wafer runs

All technical specifications are subject to change without notification. In the event of a conflict, specification contained in the Chapman Instruments Technical Specification document will supersede those contained herein.

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![Map](image-url)