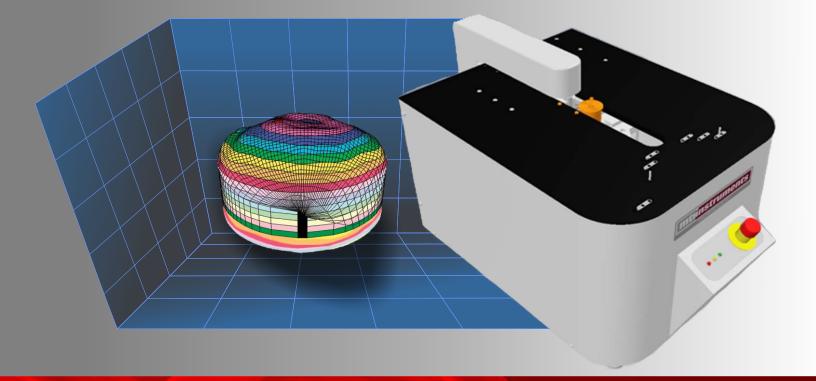


A worldwide leader in precision measurement solutions

# ► PROFORMA<sup>™</sup> 300iSA SEMI-AUTOMATED WAFER INSPECTION AND METROLOGY SYSTEM



Wafer Measurement Systems for Semiconducting and Semi-insulating Wafers

#### Proforma<sup>™</sup> 300iSA - Semi Automated Measurement Tool

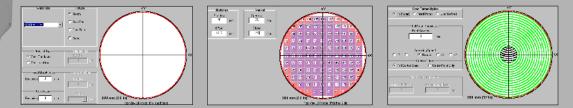
#### THICKNESS SITE WARP GLOBAL SITE BOW TTYELATNESS

Push/Pull Probes •— Vacuum Chuck •— Teflon Coating •— Wafer Alignment Pins •—

The Proforma 300iSA is a desktop, semi-automated wafer measurement system for semi-conducting and semi-insulating materials. The Proforma 300iSA delivers full wafer surface scanning for thickness, thickness variation, bow, warp, site and global flatness. User-defined and ASTM/SEMI compliant scan patterns are used to generate full 3-dimensional wafer images.

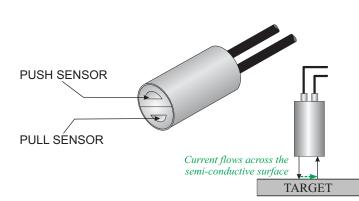


The Proforma 300iSA Controller contains all the electronics and control hardware necessary to control the Measurement Stage. It is also the interface to the external computer.



#### Unique Push/Pull Technology: -

Two Probes built into one body



To address the needs of the semiconductor industry, MTII developed its unique "push-pull™" probe technology. In this design each probe consists of two capacitance sensors, built into one probe body. Each sensor is driven at the same voltage, however, there is a 180 degree phase shift between signals. This shift allows the current path to travel across the target surface rather than through the target to ground, eliminating any inaccuracies created by poorly grounded targets.

Additionally, highly non-conductive targets can be measured with this technology, thus allowing capacitance sensors to be used on semi-insulating and semi-conducting targets.

## Proforma<sup>™</sup> 300iSA Features

- Non-contact full wafer scanning
- 3-D mapping of thickness and shape
- Measures semiconducting and semi-insulating wafers
- Standard Windows<sup>®</sup> based user interface

- Powerful software and graphics package
- Customized data reporting
- Upgradeable to fully automated system
- Up to 1000 μm measurement range
- Remote data analysis and recipe creation

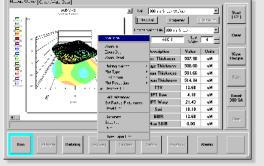
#### Proforma<sup>™</sup> 300iSA - Semi Automated Measurement Tool-

Customized data reporting, multi-format data export and full network capability allows easy access to your process information from anywhere on your network. The quick and easy to use Windows<sup>®</sup> - based control system performs complex data analysis and provides output in tabular and 3-D graphical formats which can be exported to spreadsheet and word processing programs.

The systems come preset for SEMI standard wafer diameters, with the ability to add custom wafer parameters if required. Each measurement and system parameter is selected from the user-friendly software interface.

Parameters can be modified and data recalculated without the need to rescan the wafer, allowing "what-if" engineering analysis. In addition to the powerful measurement capabilities of the standard system, an optional software package can be added for determination of wafer stress.

Able to measure as-cut, lapped, etched, polished or patterned wafers, the Proforma<sup>™</sup> 300iSA provide fast, accurate information about your process.



| perator: Administrator<br>leasurement Date: 04/10/2001<br>leasurement Time: 12/20/08 |  |                                     | Let Number: 150 mm Test Let<br>Recipe: Standard 150 mm AS-CUT wafers |                                     |                                     |                               |                                 |                               | 9<br>0<br>100.0 %             |
|--|--|-------------------------------------|--|-------------------------------------|-------------------------------------|-------------------------------|---------------------------------|-------------------------------|-------------------------------|
| Wafer<br>Number  | Wafer ID                                 | Center<br>Thickness<br>(jum)        | Average<br>Thickness<br>(jum)  | Minimum<br>Tháckness<br>(µm)        | Maximum<br>Thickness<br>(jum)       | TTV<br>(jum)                  | Bow<br>(um)                     | Warp<br>(um)                  | Sori<br>(jim)                 |
|  | Low Limit<br>High Limit                  |                                     |  |                                     |                                     |                               |                                 |                               |                               |
| 1  | Wafer #1                                 | 710.31                              | 709.72   | 708.35                              | 711.17                              | 2.82                          | -1.02                           | 2.39                          | 1.71                          |
| 2  | Wafer #2                                 | 710.10                              | 709.73   | 708.41                              | 711.13                              | 2.72                          | -0.11                           | 2.17                          | 1.67                          |
| 3  | Wafer #3                                 | 709.89                              | 709.79   | 708.36                              | 711.18                              | 2.82                          | -0.45                           | 2.24                          | 1.52                          |
| 4  | Wafer #4                                 | 709.69                              | 709.78   | 708.30                              | 711.19                              | 2.89                          | -0.20                           | 1.94                          | 1.48                          |
| 5  | Wafer #5                                 | 709.48                              | 709.93   | 708.30                              | 711.17                              | 2.87                          | -0.60                           | 2.14                          | 1.83                          |
| 6  | Wafer #11                                | 709.27                              | 709.65   | 708.29                              | 711.20                              | 2.91                          | 0.31                            | 2.17                          | 1.48                          |
| 7  | Wafer #12                                | 709.06                              | 709.92   | 708.32                              | 711.18                              | 2.86                          | 0.64                            | 1.85                          | 1.91                          |
| 8  | Wafer #13                                | 708.85                              | 709.85   | 708.31                              | 711.21                              | 2.90                          | 0.18                            | 2.50                          | 1.77                          |
| 9  | Wafer #14                                | 708.75                              | 709.61   | 708.30                              | 711.17                              | 2.87                          | 0.77                            | 2.09                          | 1.72                          |
|  | Minimum<br>Maximum<br>Average<br>Std.Dev | 108.15<br>110.31<br>109.49<br>0.520 | 709.61<br>709.93<br>709.77<br>0.106                                  | 708.29<br>708.41<br>708.33<br>0.018 | 711.13<br>711.21<br>711.18<br>0.021 | 2.72<br>2.91<br>2.85<br>0.056 | -1.02<br>0.17<br>-0.05<br>0.554 | 1.85<br>2.50<br>2.17<br>0.189 | 1.48<br>1.91<br>1.68<br>0.148 |

#### Proforma<sup>™</sup> 300iSA - Si, GaAs, Ge, SiC, InP wafers-

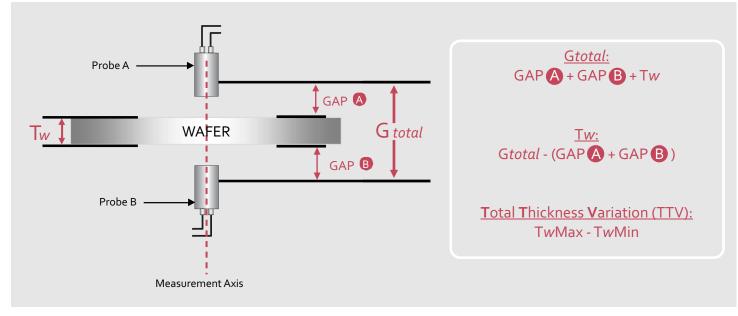
|                 | Measurement Features                   | Standard Range | Extended Range |  |  |
|-----------------|--|----------------|----------------|--|--|
| 12" (200 mm)    | Thickness (ASTM F533)                  |                |                |  |  |
| 12" (300 mm)    | Accuracy                               | ± 0.25 μm      | ± 0.50 μm      |  |  |
| 8" (200 mm)     | Repeatability                          | o.o50 µm       | o.o75 µm       |  |  |
| 6" (150 mm)     | TTV (ASTM F533)                        |                |                |  |  |
|                 | Accuracy                               | ± 0.25 μm      | ± 0.50 μm      |  |  |
| 3" (75 mm)      | Repeatability                          | o.o50 µm       | o.o75 µm       |  |  |
|                 | BOW (ASTM F534)                        |                |                |  |  |
| 1000µm          | Range                                  | ± 500 μm       | ± 800 μm       |  |  |
| thickness range | Accuracy                               | ± 2.0 μm       | ± 5.0 μm       |  |  |
|                 | Repeatability                          | o.750 µm       | o.750 µm       |  |  |
|                 | Warp (ASTM F1390)                      |                |                |  |  |
|                 | Range                                  | ± 500 μm       | ± 1500 μm      |  |  |
|                 | Accuracy                               | ± 2.0 μm       | ± 5.0 μm       |  |  |
|                 | Repeatability                          | o.750 µm       | o.750 µm       |  |  |
|                 | Flatness - Global and Site (ASTM F1530 | )              |                |  |  |
|                 | Accuracy                               | ± 0.05 μm      | ± 0.15 μm      |  |  |
|                 | Repeatability                          | o.o3 µm        | o.o5 µm        |  |  |
|                 |  |                |                |  |  |

### Proforma<sup>™</sup> 300iSA Features

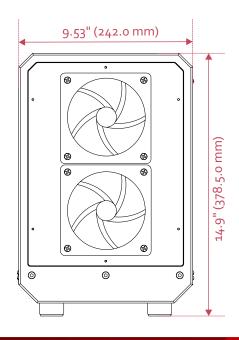
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- Measures semiconducting and semi-insulating wafers
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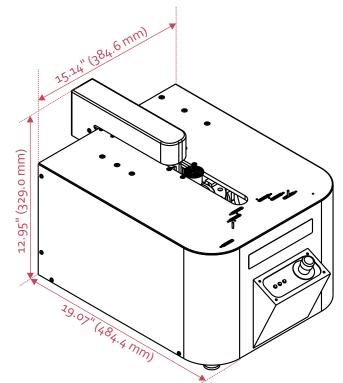
- Powerful software and graphics package
- Customized data reporting
- Upgradeable to fully automated system
- Up to 1000 μm measurement range
- Remote data analysis and recipe creation

#### Proforma<sup>™</sup> 300iSA - Measurement Principles-



| Product # | Model  |
|-----------|--|
| 8000-6485 | Proforma 300iSA (includes controller)        |
|           | Options                                      |
| 2000-2000 | Silicon (Si) calibration standard            |
| 2000-2001 | Gallium Arsenide (GaAs) calibration standard |





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