

# FLX 3300-R

AUTOMATED STRESS  
**Measurement**

Toho FLX-3300-R Thin Film Stress Measurement Systems offer industry standard capabilities for mass production and research facilities that demand accurate stress measurements on various films and substrates up to 300mm in diameter. Incorporating KLA-Tencor's patented "Dual Wave-length" technology, Toho FLX Series tools determine and analyze surface stress caused by deposited thin films. The Toho FLX systems offer out-standing value in a variety of comprehensive Stress Measurement Solutions.



## Standard Features

### Comprehensive Data Analysis

Intuitive Windows 7 based analysis software displays any combination of stress, time, surface deflection, or reflected light intensity measurements.

- Calculation of biaxial modulus of elasticity, linear expansion coefficient, stress uniformity, and file subtraction
- Trend plotting for Statistical Process Control (SPC)
- Calculation of water diffusion coefficient in dielectric films
- Automatic recalculation of stress when film or substrate thickness is corrected
- 2-D and 3-D views of wafer topography
- Plotting of the measured stress-temperature curve

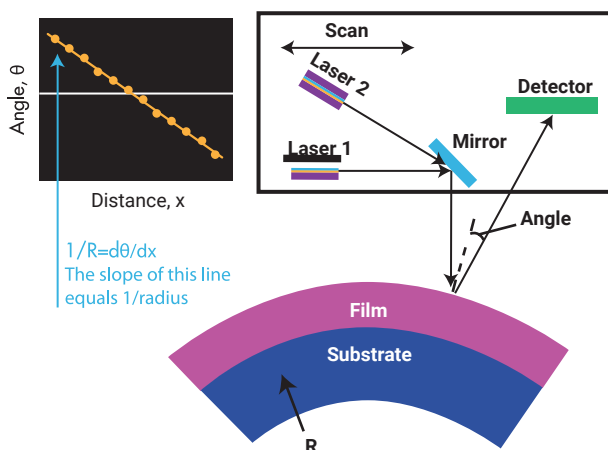
### Advanced Laser Technology

The FLX series feature KLA-Tencor's patented dual wavelength technology, which enables the system to select the wavelength most suitable for challenging films such as silicon nitride. In addition only one moving element in the optical component ensures low vibration and high accuracy.

## Applications

In general, stress is induced when materials of dissimilar coefficients of thermal expansion are bonded together. Films may behave similarly at high temperatures but as films are cooled, materials may contract / expand differently, thus causing stress in the film. With a stressed film, defects such as dislocations, voids, and cracking may occur. The FLX stress measurement system helps troubleshoot applications listed below:

- Aluminum stress-induced voids
- Passivation cracking (nitride/oxide)
- Stress-induced dislocations in Si
- Tungsten Silicide cracking
- Stress increase in oxides during temperature cycling
- Matching metallization expansion on GaAs
- Si cracking due to high film stress



FLX stress measurement systems use the laser lever technique to measure changes in pre and post deposition surface radii and then correlates these measurements into a stress value.

### Toho Technology Inc.

4809 N. Ravenswood Ave. Suite 113  
Chicago, Illinois 60640  
773.583.7183  
[www.tohototechnology.com](http://www.tohototechnology.com)

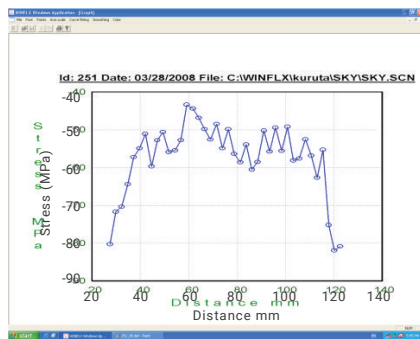


# FLX 3300-R

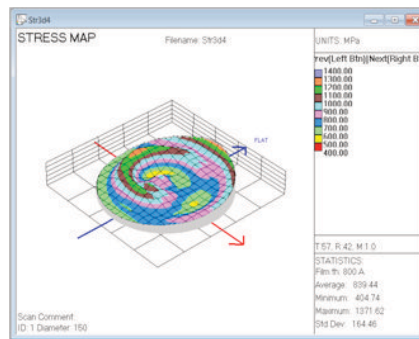
AUTOMATED STRESS  
Measurement

## FLX 3300-R

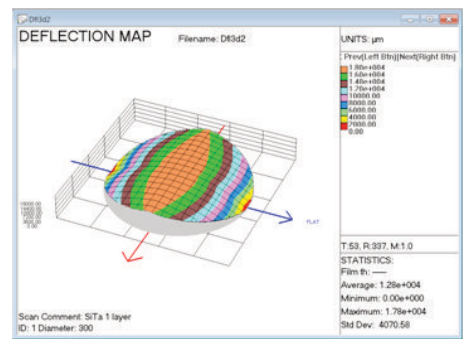
Providing fast and accurate measurements and enhanced ease of use at room temperature, the automated rotating stage model offers increased flexibility. The universal stage is recipe programmable for developing 3D measurements and serves as an optimal monitoring device for verifying film uniformity across the entire 300mm substrate surface.



Stress Temperature Graph



3-D Stress Map



3-D Deflection Map

## Specifications

### Performance

Scan Range	Programmable up to 300mm
Measurement Range	1 to 4,000MPa <sup>1</sup>
Repeatability	1.3MPa <sup>2</sup>
Accuracy	Less than 2.5% or 1 MPa (whichever is larger)
Minimum Radius	2.0m
Maximum Radius	33km
Wafer Sizes (mm)	100, 150, 200, 300mm
Minimum Scan Step	0.02mm
Compliance	Class IIIa 670nm / 780nm 4mW lasers compliant with 21CFR, Chapter 1 Subchapter J

#### Notes:

<sup>1</sup>1725 $\mu\text{m}$  wafer thickness for 10,000 $\text{\AA}$  thin film

<sup>2</sup>(1s): 1 x 10<sup>7</sup> dyne/cm<sup>2</sup>

U.S. Patent No.'s 5134303 and 5248889



The Toho FLX Series incorporates the original KLA-Tencor design and patents.

## Options

- 3D Analysis Software
- Calibration Mirror Standards
- Calibration Wafer Standards
- Substrate Adaptor Rings  
100mm to 200mm
- Offline Software

## Computer Specifications

Win 10 OS, Intel Core i5 2.66 GHz, 2GB RAM, 500 GB HD, USB port, DVD-RW optical drive

Specifications subject to change.

