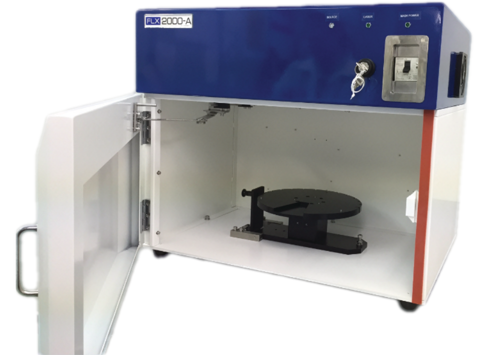
Toho TECHNOLOGY

FLX 2000-A

STREAMLINED STRESS ***Measurement***

The new FLX2000-A system has been designed to provide high quality measurements of stress and radius at a streamlined and affordable price. The system is ideal for use in Academic settings or low volume fabs. Toho FLX Series tools utilize KLA-Tencor's patented "Dual Wavelength" technology to determine and analyze surface stress caused by deposited thin films. Toho FLX systems offer outstanding value and comprehensive Stress Measurement Solutions



Standard Features

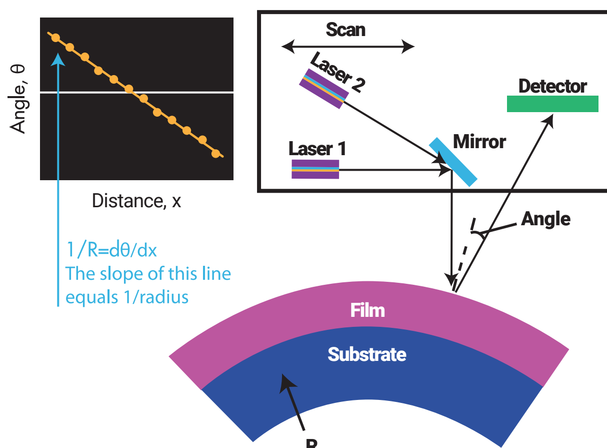
Comprehensive Data Analysis

Intuitive Windows 10 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.



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

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 expasion on GaAs
- Si cracking due to high film stress

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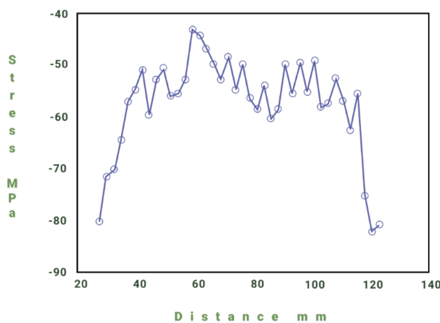
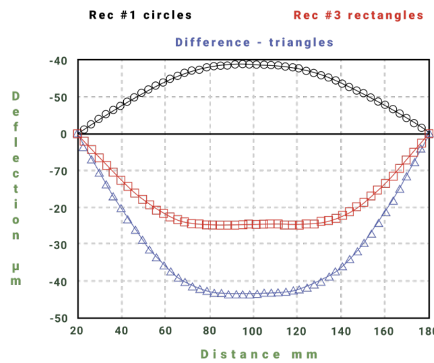
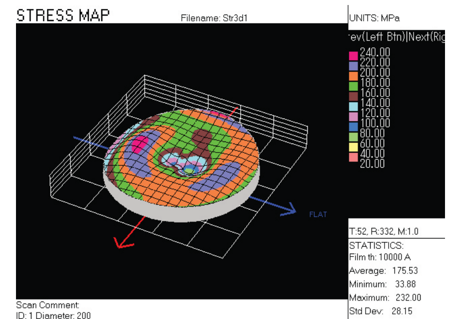
- Room Temperature, Manual Stage Rotation
- Inherent ease of the familiar FLX Platform
- Streamlined design keeps operating and maintenance costs to a minimum
- Wafer shape display, comprehensive material database, optional 3D mapping software
- Outstanding entry level value



Stress Uniformity Graph



Deflection Graph



3-D Stress Map

Specifications

Performance

Scan Range	Programmable up to 200mm
Measurement Range	1 to 4,000MPa[1]
Repeatability	1.3MPa[2]
Accuracy	Less than 2.5% or 1 MPa *(whichever is larger)*
Minimim Radius	2.0m
Maximum Radius	33km
Wafer Sizes (mm)	25, 50, 75, 100, 150, 200mm
Minimum Scan Step	0.02mm
Compliance	Class IIIa 670nm and Class IIIb 780nm 4mW lasers compliant with 21 CFR, Chapter 1 Subchapter J

Notes:

[1] 725µm wafer thickness for 10,000Å thin film

[2] (1s): 1 x l0[7] dyne/cm^{2}

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

Options

- 3-D Analysis Software
- Calibration Mirror Standards
- Calibration Wafer Standards
- Substrate Adaptor Rings
  25mm to 150mm
- Offline Software

KLA

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