Thin Film Metrology
SpecEl-2000 Ellipsometry System

The SpecEl-2000 is a benchtop thin film measurement system utilizing spectroscopic ellipsometry to measure multilayer, semi-transparent samples such as flat wafers or glass plates. The Spec-El-2000 is affordable, compact (52 cm x 33 cm x 24 cm) and convenient, with easy placement of the sample and one-button operation. SpecEl is part of the Mikropack line of thin film metrology systems. Models are available for 300-1000 nm (SPECEL-2000-UV-VIS-NIR) and 400-1000 nm (SPECEL-2000-VIS-NIR). SpecEl systems include an integrated spectrometer, broadband light source and controller; software is available separately.

SpecEl Features

- Film thickness accuracy to 1.0 nm
- Resolution to 0.1 nm
- Multi-layer stack measurements up to 25 layers
- Single film thickness up to 10 µm
- Spectral ranges from 300-1000 nm
- Standard spot size 0.4 mm x 1.2 mm
- Ideal for flat, semi-transparent samples such as wafers, glass, films and foils
- 3D mapping, reference wafers, accessories and other options available
- Accompanying software allows generation and recall of measurement recipes for one-step, repetitive measurements
- Accessories for thickness mapping

Software for SpecEl-2000 Systems

Powerful SpecEl software offers a range of modeling possibilities such as Cauchy, OJL, Tauc-Lorentz, Drude, EMA and different types of oscillators. The software also stores specific measurement routines, reducing the tedium of repetitive measurements and easing integration.

Specifications

System Performance	
Thickness range:	1 nm-10 µm
Resolution:	0.1 nm
n and k analyzer:	Values calculated for complete spectral range
Mathematical models:	Extensive range of options includes constant refractive index, harmonic oscillator and imported dielectric functions
Measurement speed:	7-13 seconds
Repeatability:	70 nm for SiO2 on Si, cos(Delta) ±0.0003, tan(Psi) ±0.0002
Sample size:	Desktop up to 150 mm diameter; mapping up to 300 mm diameter
Sample thickness:	5 mm (maximum)
Optical	
Wavelength range:	(UV-NIR) 300-1000 nm or (VIS-NIR) 400-1000 nm
Optical resolution:	1.0 nm
Beam diameter:	400-1200 µm
Angle:	70°
Computer	
Software:	Windows XP/7 (32bit) software; also, recipe structure, administrator-user compatible
Hardware:	PC with Windows XP/7 (32bit)

Standard Operating Software (required)	
SPECEL-ELLICALC	User-friendly 32-bit Windows software for ex situ direct measurement of thickness and n and k coefficients; recipe structure and administrator/user capabilities
SCOUT-FULL VERSION	SCOUT software. Spectrum simulation program for Windows XP/7 (32 bit). Computes reflectance, transmittance, absorbance or ellipsometry spectra and fits your model to measured spectra by manual, graphical or automatic parameter variation. SCOUT can be controlled by OLE automation controllers.

Add-on Software Option	
SPECEL-MAPPING	Mapping module software (must be used with SPECEL-ELLICALC software). Complete mapping module with software control of 150 mm and 300 mm mapping stages; includes XYZ controls and 3D-graphics

Accessories for SpecEl-2000 Systems

We offer reference wafers and mapping stages for use with SpecEl systems. Mapping stages must be purchased at time of SpecEl system order. Replacement parts are also available.

MAPPING-6-INCH-SE	150 mm x 150 mm XY-scanning stage; fully automatic w/vacuum chuck, 2 motors with encoders, control system integrated 2-axis CNC controller, RS-232 interface; portal structure
MAPPING-12-INCH-SE	300 mm x 300 mm XYZ-scanning stage; fully automatic w/vacuum chuck, 2 motors with encoders, control system integrated 2-axis CNC controller, RS-232 interface; portal structure
STEP-WAFER	Reference Si-SiO2-step-wafer, 5 steps from 0-500 nm, calibrated, 100 mm diameter
STEP-WAFER-600-1100	Reference Si-SiO2-step-wafer, 5 steps from 600-1100 nm, calibrated, 100 mm diameter