

NanoSpec®/AFT 2100

Faster, easier, more precise measurements can now be made on your fab production line with the Model 2100 NanoSpec/AFT film thickness measurement system. You can measure a wide range of transparent films on any substrate, including 75mm, 100mm, 125mm, 150mm, and 200mm diameter wafers. An optional loader is available for tweezer-free wafer handling. The small spot sizes available in the Model 2100 make the system well suited for measurement on patterned wafers. You may actually achieve lower cost of ownership and higher throughput with multiple installations at key locations in your fab.

NANOMETRICS' EXPERIENCE

Nanometrics pioneered the development of small spot spectrophotometry film thickness metrology - starting in 1977. With an installed base of over 3000 tools in leading semiconductor fabs throughout the world, Nanometrics understands user problems, and consistently develops optimized solutions in partnership with its customers. When you purchase a Nanometrics film thickness measuring system, you automatically benefit from many years of product refinement, high reliability and dedicated customer support.

PRECISE AND REPEATABLE MEASUREMENTS TO GIVE YOU CONTROL

To give you the measurement precision your process requires, the Model 2100 comes equipped with a proprietary high resolution scanning wavelength spectrophotometer which uses a 1200 line/mm Blazed Holographic Diffraction Grating and high sensitivity Gallium Arsenide Detector. This high dispersion spectrophotometer system produces short-term repeatability of $\pm 5\text{\AA}$ or better on most single layer films of all thicknesses to 50,000 \AA .

SIMPLE OPERATION THAT SAVES YOU TIME

The procedures to operate the Model 2100 are so simple you can train a novice user in about 15 minutes. The easy-to-learn measurement and calibration procedures are menu-driven. A simple guide for locating the next measurement area and its status is displayed for your operator on a wafer site locator map. Site locator maps, measurement readings, and instructions are shown on a bright CRT display, to further simplify operations.

FLEXIBILITY TO FIT YOUR NEEDS - Spot check or do multiple sites with ease

Measurements can be made of your films with 16 standard film tests. The films which can be measured include a wide variety of photoresists, polyimide, and polysilicon, as well as oxide and nitride films covering ranges from 100 \AA to 500,000 \AA . In addition to these, many special films can be measured by simply entering the refractive index of the film and reflectance information observed on a strip chart recorder. The Model 2100 also gives you the flexibility of measuring many types of transparent films on numerous substrates such as aluminum, GaAs, chrome, ceramic, nickel-iron, copper, and glass, to name a few.

The process engineer can develop up to 32 custom tests of individual films at different mask levels for statistical data storage, special film calculation, and exact calibration. These tests are designed by simply specifying the film type and wafer pattern to be measured. The test results are displayed on the CRT and are saved in a non-volatile storage, which means no loss of data even if your power is interrupted. The system can then provide statistical analysis of your test results, and display the analysis in a histogram. The process engineer also has the flexibility to do calibration corrections based on accurate two-point calibrations of slope and offset values.

As the Model 2100 has a SECS II bi-directional interface, it can communicate with a host computer. This is just one of the many standard features of the Model 2100 which gives you the flexibility to meet the film measurement requirements you have today - and may have tomorrow.

RUGGED CONSTRUCTION YOU CAN DEPEND ON

The modular system design of the Model 2100 provides you easy access and serviceability. It has a sturdy microscope which uses reflected light. The microscope has turret-mounted 4X, 10X, and 40X parfocal objectives to vary your measuring spot size. Precise location of the spot to be measured is achieved through a monocular viewer with a 10X eyepiece. The viewer sits above a 6" x 6" mechanical travel stage that has a two-position wafer slider. Depending on your process needs, three different configurations for the wafer slider are available: 75mm and 100mm, 100mm and 125mm, or 125mm and 150mm. An optional 200mm slider is also available. All these components were designed into a compact, table-top unit. Thus, the Model 2100 has a small footprint and is space efficient in the production environment.

PERFORMANCE SPECIFICATIONS

Absolute Accuracy ¹ :	Within $\pm 1\%$ of certified range of NIST traceable oxide standards
Precision ² :	2 \AA , 500-50,000 \AA
Stability ³ :	0.5% or 5 \AA or whichever is greater
Thickness range:	100 \AA to 50 μm
Spot Size Range:	6.5 μm to 65 μm

HARDWARE SPECIFICATIONS

Wavelength Range:	400-800nm
Standard Wafer Sizes:	75, 100, 125, 150 (200mm option)
Microscope:	High Quality Optical Microscope with 10X Eyepiece and 3 Objective Lenses (4X, 10X, and 40X)

DATA COMMUNICATIONS

Standard ASC II Data Dump to Floppy
SECS II Bi-directional Interface

PHYSICAL CHARACTERISTICS

Dimensions (H x W x D):	
Microscope and Spectrophotometer:	30 5/8" x 24 1/2" x 20"
Computer:	9 1/2" x 7 1/2" x 21 1/2"
CRT Terminal:	14" x 13 1/2" x 13 1/2"
CRT Keyboard:	2" x 18 1/2" x 8"
Optional Printer:	3 1/8" x 7 3/8" x 6 1/2"
System Weight:	95 lbs.

INSTALLATION REQUIREMENTS

Power:	117 VAC $\pm 5\%$, 50/60 Hz, 5A
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SHIPPING WEIGHT

150 lbs.

¹ Absolute Accuracy: On oxide standards 500, 1000 and 2000 \AA thickness
² Precision: One sigma based upon measurement of the same spot 15 times in succession on standard semiconductor film
³ Stability: Standard deviation of the means of the precision test taken daily on the same wafer over a period of 5 days



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