Thin-Film Thickness Measurement
Color Measurement

From Academic Research to Semiconductor & FPD Process

Total Monitoring & Measuring System

K-MAC®
Korea Materials & Analysis Corp.

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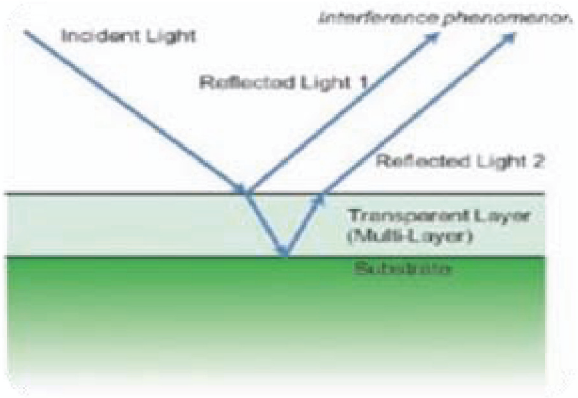
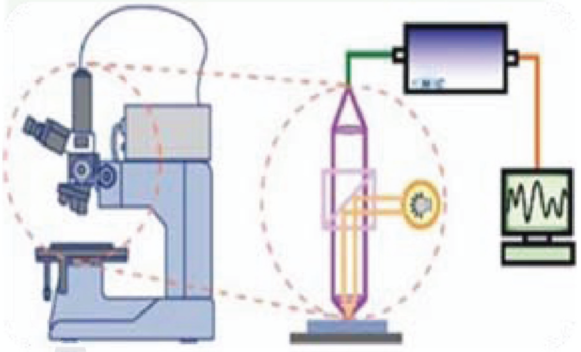
Thickness Measurement Technology

Principle



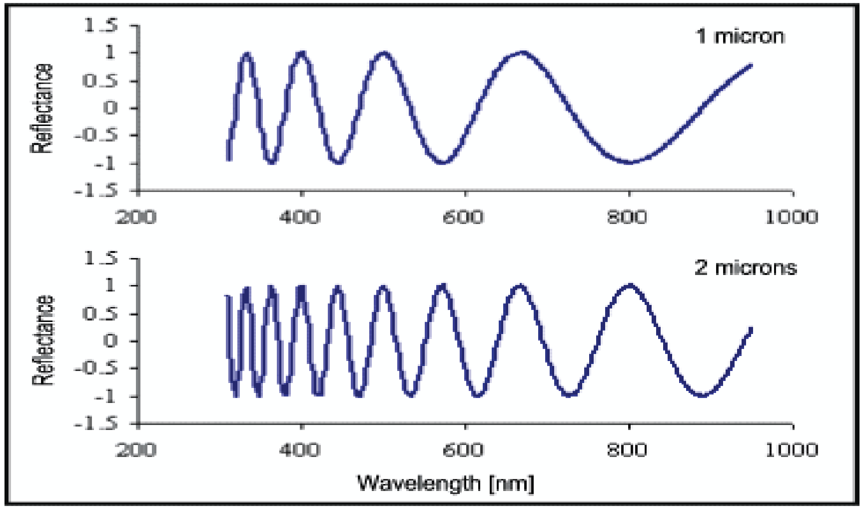


Coherent Light

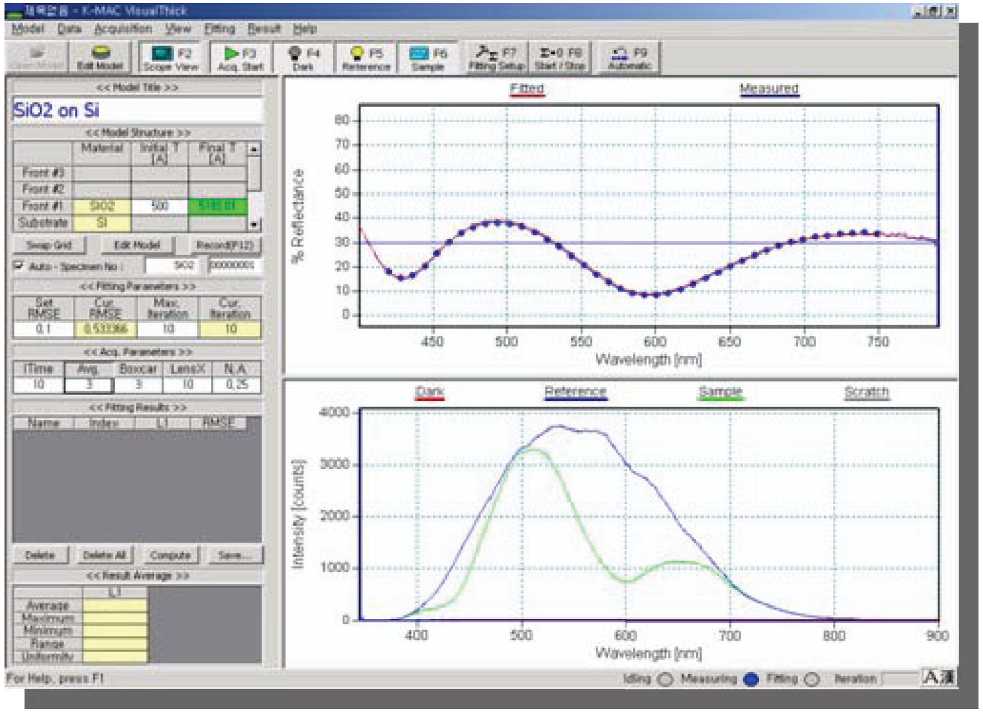
→ Reflection from Surface + Reflection from Interfaces btw Films/Substrate

= Interference Phenomenon

→ Constructive/Destructive Interference dep. over Wavelengths



Thickness Measurement Technology



<< Model Title >>

SiO2 on Si

<< Model Structure >>

	Material	Initial T [A]	Final T [A]
Front #3			
Front #2			
Front #1	SiO2	500	5180.01
Substrate	Si		

☑ Auto - Specimen No : SiO2 00000001

<< Fitting Parameters >>

Set RMSE	Cur. RMSE	Max. Iteration	Cur. Iteration
0.1	0.533366	10	10

<< Acq. Parameters >>

ITime	Avg.	Boxcar	LensX	N.A
10	3	3	10	0.25

<< Fitting Results >>

Name	Index	L1	RMSE

<< Result Average >>

	L1
Average	
Maximum	
Minimum	
Range	
Uniformity	

Main Advantages

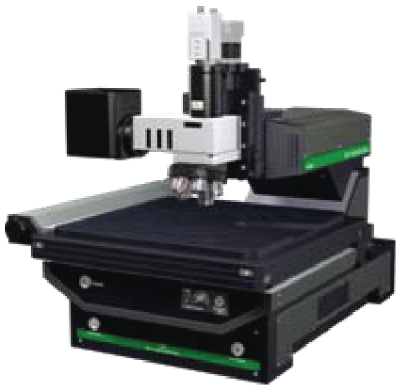
- Fast Measurement & Easy Operation
- Non-Contact, Non-Destructive Method
- Superb Repeatability & Reproducibility
- 2D/3D Mapping & Contouring
- Auto-Focusing
- User-Friendly Interface

Thickness Measurement System for R&D Lab Scale

- Non-Contact/Non-Destructive
- Reflectometer
- Real-time measurement, Multi-spot display
- Windows based S/W (Excel, Origin, MS-Word save)
- Various n, k model (Cauchy, Cauchy Expotential, Sellmeier)
- 2D,3D mapping data Display (point by point)
- Semi-automatic mechanism stage control
- Fast measurement, Easy operation
- CCD Camera + Auto Focusing

ST2000-DLXn

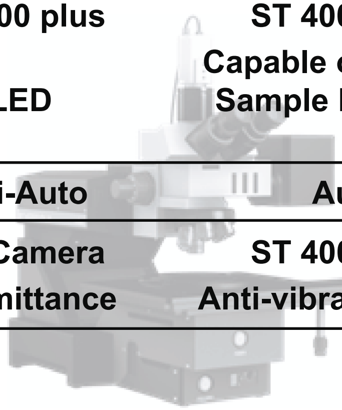
ST4000

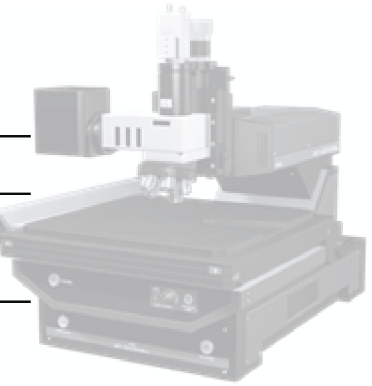


ST5030-SL

Thickness Measurement : Spec & Application (1)

	ST2000	ST4000	ST5030
Stage (mm)	150 X 120	Max. 300 X 300	300 X 300
Sample (in)	$\leq$ 4	ST 2000 + 8”, 12”	$\leq$ 4
Range	200 Å ~ 35 ㎛	100 Å ~ 35 ㎛	100 Å ~ 35 ㎛
Time (sec/site)	1 ~ 2	1 ~ 2	1 ~ 2 (Fitting T.)
Application	Polymers (PVA, PET, PP, PR), Dielectrics (SiO_2, TiO_2, ZrO_2, Si_3N_4), Semicon (Poly-Si, GaAs, GaN, InP, ZnS and etc.)	ST 2000 plus OLED	ST 4000 plus Capable of Stage & Sample Extended
Operation	Manual	Semi-Auto	Auto
Etc.	Basic Type	CCD Camera Transmittance	ST 4000 plus Anti-vibration Table





Thickness Measurement System for Process Monitoring (LCD,PDP)

▶ **Exclusive model for fine measurement with prominent function**

▶ **Measuring multi film thickness formation and refractivity distribution rate by means of 2-dimensional reflection spectrophotometer principal**

▶ **Applicable to 4-mask process of TFT LCD**

ST6000

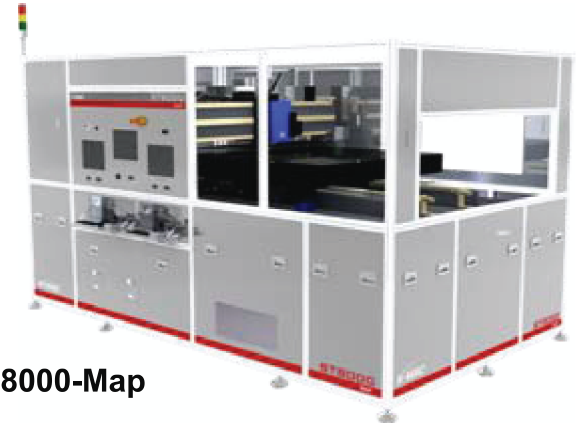
Major Customer

▶ **Korea : Samsung Electronics,**
LG-Philips, Samsung SDI

▶ **Japan : Sharp, Hitachi**

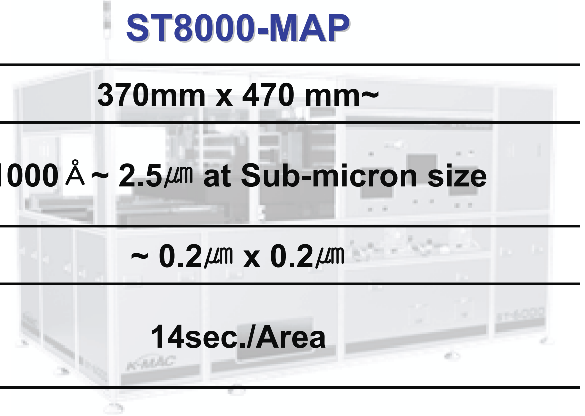
▶ **Taiwan : AUO, CPT, CMO, QDI etc**

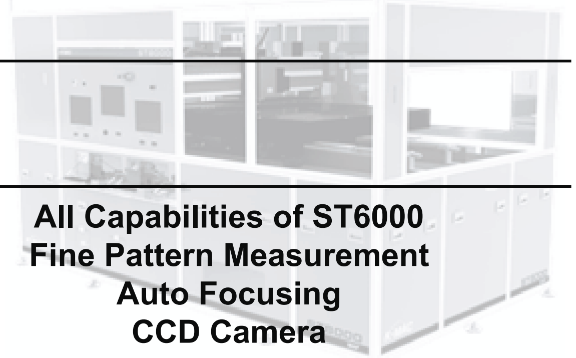
▶ **China : BOE OT**



ST8000-Map

Thickness Measurement System : Spec & Application (2)





	ST6000	ST8000-MAP
Stage Size	370mm x 470 mm~	370mm x 470 mm~
Measurement Range	100Å ~ 35㎛	1000Å ~ 2.5㎛ at Sub-micron size
Spot size	40㎛/20㎛, 4㎛(option)	~ 0.2㎛ x 0.2㎛
Measurement Speed	1~2 sec./site (fitting time)	14sec./Area
Application Areas	Polymer: PVA, PET, PP, PR Dielectrics: SiO2, TiO2, ITO, ZrO2, Si3N4 Semiconductors: Poly -Si, GaAs, GaN, InP, ZnS Display: PR, ITO, SiO2, TiO2, ZrO2...	Half-tone Measurement All Capability of ST6000/7000
Option	Contact Angle Measurement RS Measurement Using a 4-point Probe Transmittance Measurement	
Function	Fully Automated Thickness Measurement Auto Focusing CCD Camera Pattern Recognition CIM Communication	All Capabilities of ST6000 Fine Pattern Measurement Auto Focusing CCD Camera Pattern Recognition CIM Communication

Thickness Measurement for SEMICONDUCTOR

Thin Film Thickness Measurement System for SEMICONDUCTOR(300mm EFEM System)

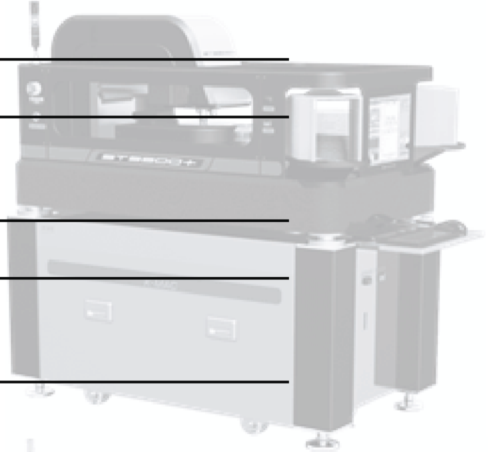
- ▶ **Easy Operation & Maintenance**
- ▶ **Customized Software**
- ▶ **SEMI Standards Qualified**
- ▶ **High Reliability, Pre-Aligner**
- ▶ **User Interface with Color Touch Screen**
- ▶ **Class-1 Clean Room Environment**
- ▶ **Cart Docking & Load Port(FOUP)**
- ▶ **Fully Integrated System**
- ▶ **SEMI Standards Qualified**
- ▶ **Customized Software, Pre-Aligner**

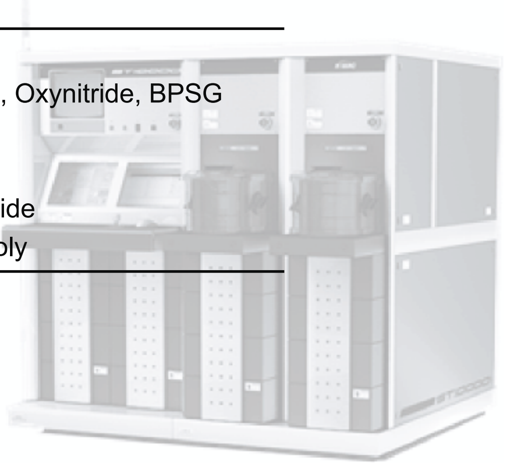
ST5500-PLUS

ST10000

Thickness Measurement Spec & Application

Thin Film Thickness Measurement System for SEMICONDUCTOR(300mm EFEM System)





Wavelength Range	200~780nm(UV-Vis)
Measurement Range	50 Å ~ 40um(Standard) 35 Å ~ 70um(Optional)
Spot size	15X: ≤ 30um(Diameter)
Repeatability(10˚)	50 ~ 5000 Å : ≤ 0.7 Å 5000 Å ~ 40um: ≤ 0.004%
Reproducibility(10˚)	50 ~ 5000 Å : ≤ 0.1 Å 5000 Å ~ 40um: ≤ 0.003%
Application Areas	***Single-Layer*** **CVD** : Amorphous Silicon, Nitride, Oxynitride, BPSG **PVD** : Titanium Nitride **Coater** : Photoresist, PI **Oxidation** : Oxide on Metal, Silicon Oxide **Oxidation & Crystalization :** Poly on Oxide, Oxide on Poly ***Multi-Layer*** Aluminum Oxide/Nikel Iron Inorganic Low-k Dielectric/ Silicon carbide Inorganic Low-k Dielectric/Silicon carbide/Copper Nitride/Oxide/Poly-Si/Oxide/Silicon Nitride/Oxide/Si