FR-CasScan is a radical & holistic wafer characterization system at production environments. FR-CasScan provides fully automated characterization of films on wafers along with a robust Cassette Loader.
FR-CasScan is equipped with advanced features such as: pre-aligner, high resolution and repeatability XY stage with 200mm travel on each axis, powerful UV/VIS/NIR autofocus microscope, high resolution spectrometer and numerous accessories (OCR, SECS/GEM, …)

APPLICATIONS

- Semiconductor fabrication
- University & Research labs
- Resist characterization
- Dielectric characterizations
- Hardcoats, Anodization
- Optical Coatings
- And many more…

With **FR-CasScan**, the accurate, fast and detailed characterization of ultra-thin, thin, thick & very-thick films on wafers is just a click away. The **very low Total Cost of Ownership system** is designed to handle heavy loads (even bonded wafers) without maintenance.

The **cassette loading unit** automatically pre-align and load wafers on the microscope's stage. The unit offers high speed, safe and smooth wafer handling (wafer thickness down to 200µm) and automatic wafer size detection.

The **measurement unit** is equipped with fast and with high accuracy & repeatability motorized XY-stage capable to map wafers of any diameter up to 8in.

Automatic mapping mode, e.g. patterned wafers – in combination with automated wafer loading from cassette or manual loading – by means of point-to-point measurements through joystick or software is supported.

The system, comes with a powerful optical **autofocus microscope** with travel up to 80mm and several long working distance objective lenses that guarantee measurement with spot size < 4µm.

Specifications

Model		UV/VIS	UV/NIR-HR	D UV/NIR	VIS/NIR	D VIS/NIR	NIR
Spectral Range (nm)		200 – 850	200-1100	200 – 1700	380 –1020	370 – 1700	900 – 1700
Spectrometer Pixels		3648	2048	3648 & 512	3648	3648 & 512	512
Thickness range	5X- VIS/NIR	4nm – 60µm	4nm – 110µm	4nm –	15nm –	15nm–150µm	100nm-150µm
	10X-VIS/NIR	4nm – 50µm	4nm – 80µm	4nm –	15nm –	15nm–130µm	100nm–
	15X- UV/NIR	4nm – 40µm	4nm – 50µm	4nm –	–	–	100nm-100µm
	20X- VIS/NIR	4nm – 25µm	4nm – 30µm	4nm – 50µm	15nm –	15nm – 60µm	100nm –
	50X- VIS/NIR	–	15nm – 5µm	–	15nm –	15nm – 8µm	100nm – 8µm
Min. Thickness for n & k		50nm	50nm	50nm	100nm	100nm	500nm
Thickness Accuracy *		0.2% or 1nm			0.2% or 2nm		3nm or 0.3%
Thickness Precision **		0.02nm			0.02nm		<1nm
Thickness stability **		0.05nm			0.05nm		<1nm
Light Source		Balanced Deuterium & Halogen, 2000h (MTBF)			Halogen (internal), 3000h (MTBF)		
Pre-Aligner module		Included					
Wafer types		Si, $LiNbO_3$, GaAs, Ge, Al_2O_3, Glass, SiC, other semiconductor substrates					
Wafer Sizes		6in & 8in for automated handling & loading. 2in-8in for manual loading (irregular shape)					
Wafer Handling		High reliability carbon fiber end effector, Cassette laser mapping					
Material Database		> 850 different materials					
Dimensions & Weight		Dimensions: 150x79x150cm (LxWxH) main tool, 90x79x75cm (LxWxH) computer table. Total Weight:					
Clean Room compatibility		Class 10					
Power requirements		Power Requirements: 230±10% VAC, 50-60 Hz, 1KVA					
Dry air requirements		600 kPa, >100 Nl/min (normal liter per min)					
Vacuum requirements		-75 to -90 kPa, >10 Nl/min (normal liter per min)					
PC characteristics		AllInOne Win10/11, i7-12gen CPU, 16GB RAM, SSD disk, 23.8in monitor					

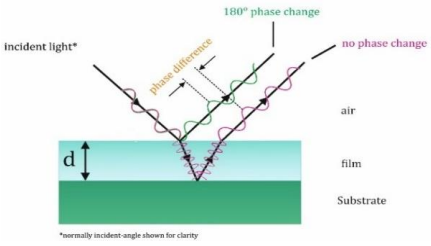
Accessories

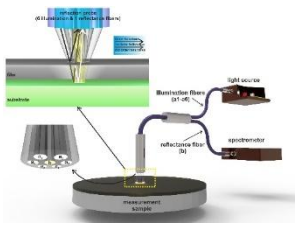
OCR module	Optical module attached on the reflection probe for <100µm diameter spot size
Objective lenses	A wide range of objective lenses: VIS/NIR (5X, 10X, 20X, 50X) and UV/NIR (15X, 20X, 25X, 40X)
SECS II/GEM	SECS II/GEM interface with factory server

Principle of Operation

White Light Reflectance Spectroscopy (WLRS) measures the amount of light reflected from a film or a multilayer stack over a spectral range, with the incident light normal (perpendicular) to the sample surface.

The measured reflectance spectrum, produced by interference from the individual interfaces is being used to determine the thickness, optical constants (n & k), etc. of free-standing and supported (on transparent or partially/fully reflective substrates) stack of films.





* Specifications are subject to change without any notice; ** Thickness range depends on the spectral range and refers to a single layer with refractive index ~1.5 on Si substrate ** Measurements compared with a calibrated spectroscopic ellipsometer and XRD, Average of standard deviation of mean value over 15 days. Sample: 1µm SiO_2 on Si, Standard deviation of 100 thickness measurements. Sample: 1µm SiO_2 on Si, 2*Standard-Deviation of daily average over 15 days. Sample: 1µmicron SiO_2 on Si.