

# Near-Infrared Spectrometer

**SM304**



Near-Infrared (NIR) Spectrometer SM304

**SP SPECTRAL PRODUCTS**

## SM304

### Near-Infrared (NIR) Spectrometer

User Selectable various NIR Ranges from 0.9 - 2.5  $\mu\text{m}$

Low Dark Noise and High Stability

Best Performance for NIR Spectroscopy

Wide dynamic range and high signal-to-noise ratio

**Optical Dark Option (Auto Shutter)**



#### The Choice for Low Signal Level NIR Applications

Spectral Products offers the new SM304 TE-cooled InGaAs/Extended-InGaAs array spectrometers. The SM304 series are ideal for NIR spectroscopic measurement that requires a very high signal-to-noise ratio and/or high dynamic range through the 0.9 - 2.5  $\mu\text{m}$  spectral range.

The high performance with a low-noise level of the SM304 series makes it possible to apply in various demanding applications. The good sensitivity of the detectors used in the SM304 series allows various broad-band applications such as measuring the optical properties of solid/liquid/gas samples in the NIR range, analyzing chemical components, detecting moisture, and narrow bandwidth applications like NIR laser characterization.

The standard interface of the SM304 series is a USB interface with 16-bit AD conversion. Software support includes various SDK examples and DLLs for dedicated applications development and Windows OS-based spectral acquisition and analysis software (SM32Pro & SMProMX).

## Specifications :

Feature	Value				
Models	SM304-512	SM304-512-2.2	SM304-512-2.5	SM304-256-2.1	SM304-256-2.5
Detectors	G9204-512	G9206-512	G9208-512	G9206-256	G9208-256
Pixel Size	25 X 500 μm	25 X 250 μm		50 X 500 μm	
Spectrograph f-number	3.3				
Dark	Auto Shutter				
Dark Readout Noise RMS <sup>1</sup> (w/single scan, no time averaging)	6 @100ms		16 @10ms	6 @100ms	8 @10ms
Signal to Noise Ratio (SNR) <sup>1</sup> (w/single scan, no time averaging) <sup>2</sup>	>15,000 : 1 @100ms	>10,000 : 1 @ 100ms			>7,500 : 1 @ 10ms
Spectral Response Range	0.9-1.7 μm	0.9-2.2 μm	0.9-2.5 μm	0.9-2.05 μm	0.9-2.5 μm
Order Sorting Filter	Long-pass filter or linear variable filter installed according to wavelength coverage				
Optical Resolution (Max. with 25 μm or 50 μm slit)	>3 nm overall	>4.5 nm overall	>5.5 nm overall	>7.0 nm overall	>10.0 nm overall
Stray Light	<0.01 % at 632 nm (<0.05 % Ave)				
Fiber Coupling	SMA905 or FC/PC standard				
Computer interface	USB 1.1/2.0 compatible				
Minimum integration time	1 msec				
Trigger Mode	Free Run Mode				
	Software Trigger Mode				
	External trigger mode (20-pin connector) : TTL Edge trigger input				
Power Input	DC 5V, 5A Max				
Dimensions	173 mm X 120 mm X 75 mm				
Weight	2.0 kg				
Software	SM32Pro / SMPProMX				
	Includes DLL libraries and SDKs for user customized application development				

<sup>1</sup> : Measured with TEC ON & 10pF CF value

<sup>2</sup> : Max signal level at ~50,000 counts, using 5W tungsten-halogen light source (regulation: +/-0.4%)

## Resolution Chart :

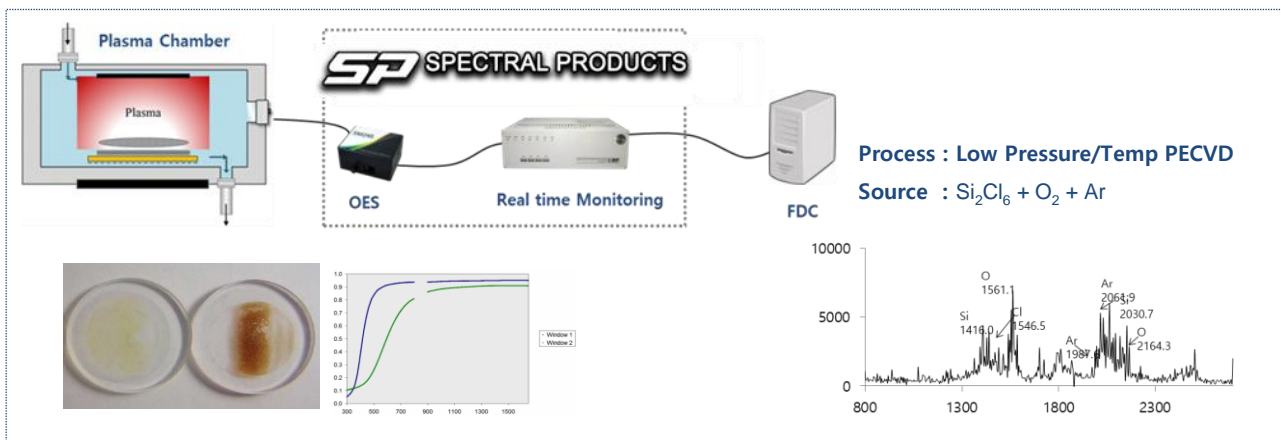
Feature	Value				
Models	SM304-512	SM304-512-2.2	SM304-512-2.5	SM304-256-2.1	SM304-256-2.5
Spectral Response Range	0.9-1.7 $\mu\text{m}$	0.9-2.2 $\mu\text{m}$	0.9-2.5 $\mu\text{m}$	0.9-2.05 $\mu\text{m}$	0.9-2.5 $\mu\text{m}$
Slit Width ( $\mu\text{m}$ )	Max. Optical Resolution (FWHM, nm)				
25	3	4.5	5.5	-	-
50	-	-	-	7.0	10.0

(Note) Optical Resolution Value : Average

## Applications

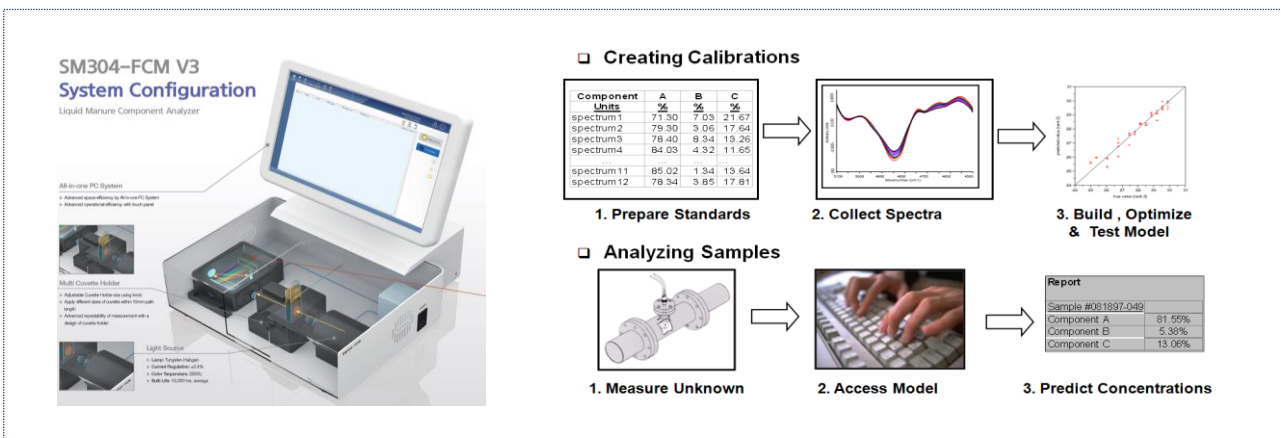
### NIR OES Sensor for Plasma Diagnostics

- Long term usage resistant to view port pollution for plasma diagnostics in semiconductor fabrications
- Extended spectral range of OES(optical emission spectroscopy) sensor up to 2.5  $\mu\text{m}$



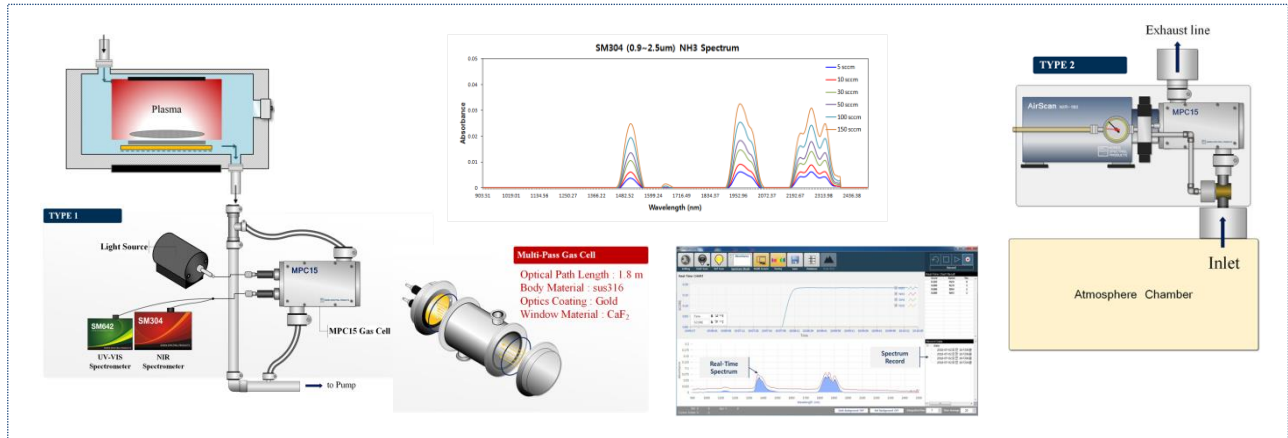
### Real time NIR Spectrophotometer

- Real time measurements of transmission and absorption without mechanical grating rotation/scanning
- Analysis and optical monitoring of various solid/liquid/gas samples (Chemicals, Liquid Fertilizer, etc.)
- Customized calibration formula by use of signal processing, chemometrics, and statistical algorithms



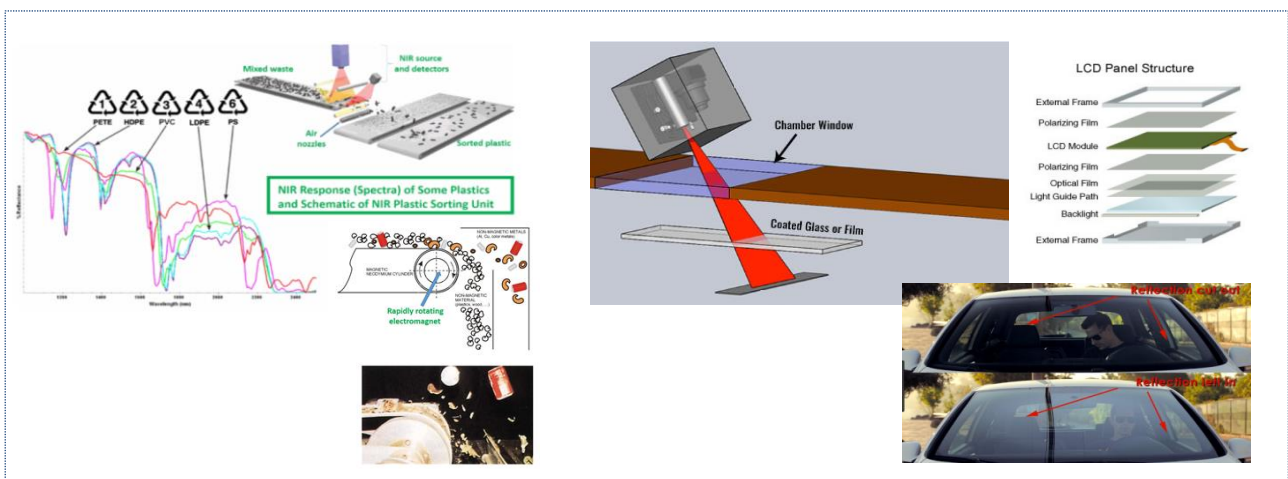
## Optical Monitoring of Gas and Water Vapor

- In-Situ quantitative optical monitoring of vacuum / atmospheric gases and water vapor
- Customized configuration for various applications in laboratories and industrial factories



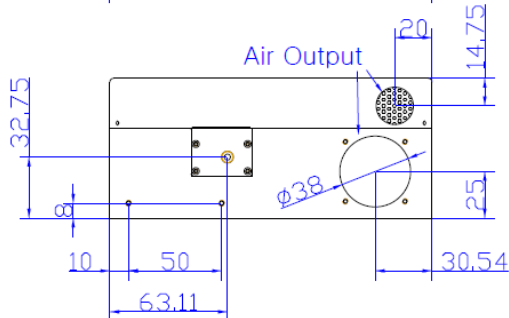
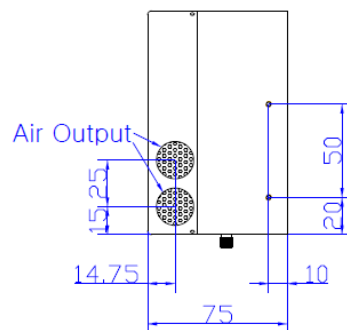
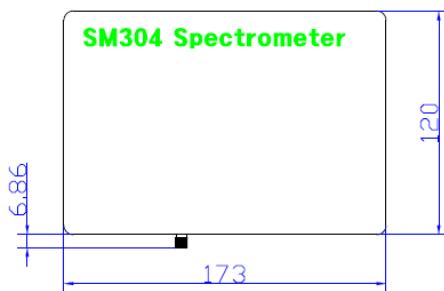
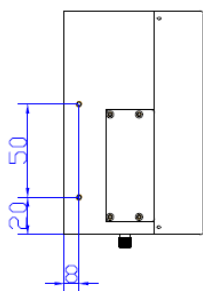
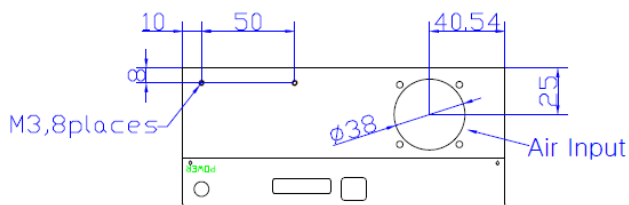
## Analysis of optical & chemical properties of films and materials

- Measurement of thickness and optical properties of high thickness films
- Measurement of reflectance and transmittance (absorbance) of various materials (plastic and film etc)





## Case Dimension :



**Ordering Information :** Please indicate product number and description when ordering

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