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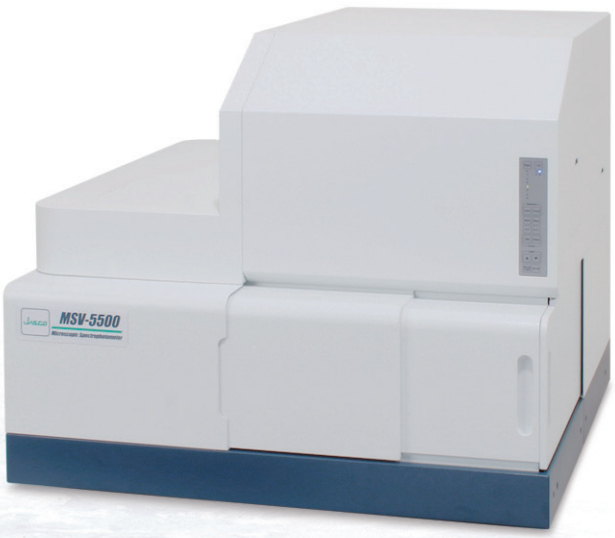
MSV-5500/5700/5800

UV/Vis/NIR Microscopic Spectrophotometer

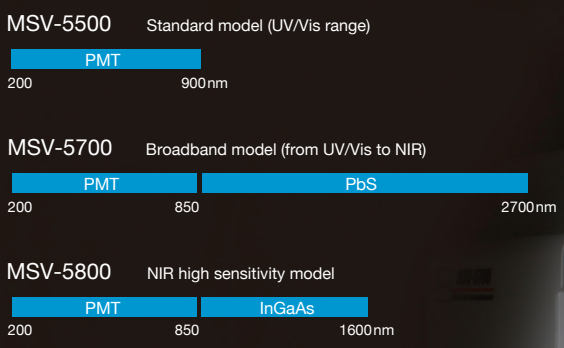


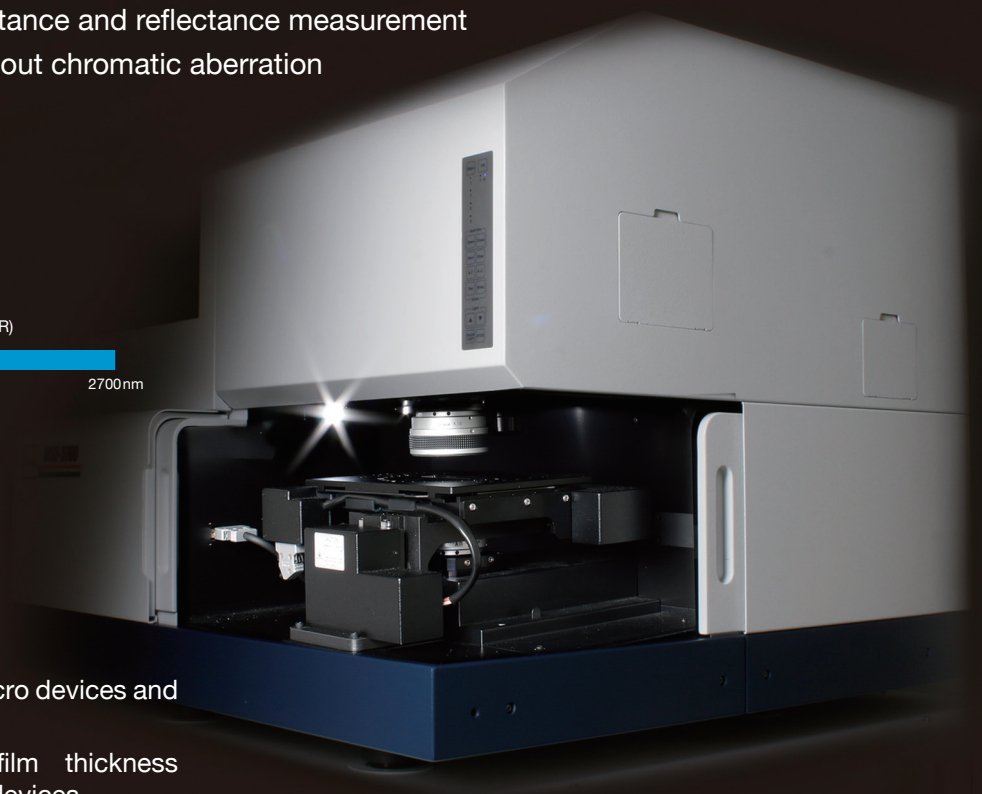
JASCO

New possibilities in Microscope spectroscopy

Features of MSV-5500/5700/5800

- 10 μmϕ area spectral transmittance and reflectance measurement
- Wide range measurement without chromatic aberration
- Excellent photometric stability





Powerful applications

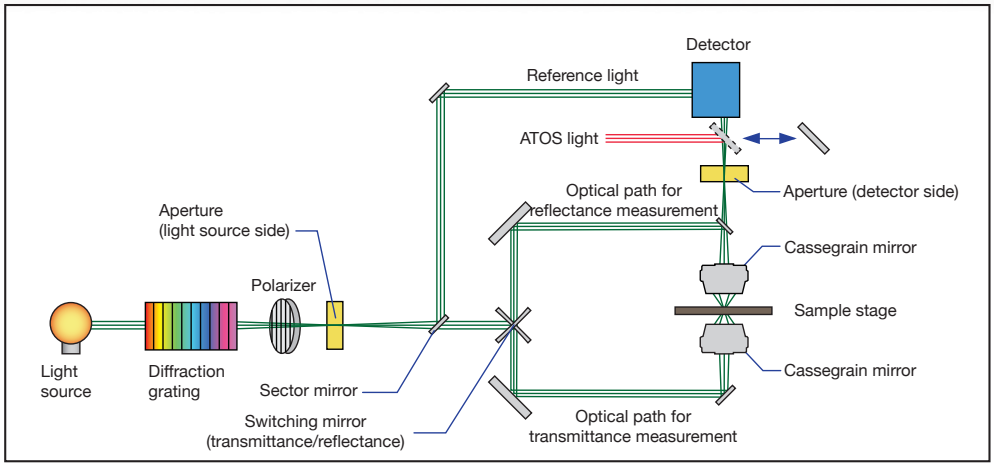
- Optical propertiy evaluation of micro devices and photonic crystals
- Bandgap measurement and film thickness measurement of semiconductor devices

Flexible Options

- Various accessories such as automatic XYZ stage and integrating sphere
- Sharing of measurement position information with infrared microscope and Raman microscope - IQ Frame

High performance comparable to a high resolution spectrophotometer

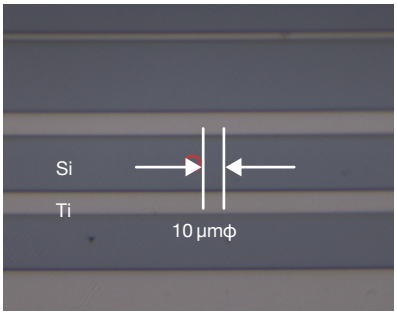
MSV-5500/5700/5800 uses a monochromator with precise optical slits to effectively focus the selected monochromatic wavelength from the UV to NIR onto the sample, and provides enhanced wavelength accuracy and linearity and even for the measurement of minute sample areas.



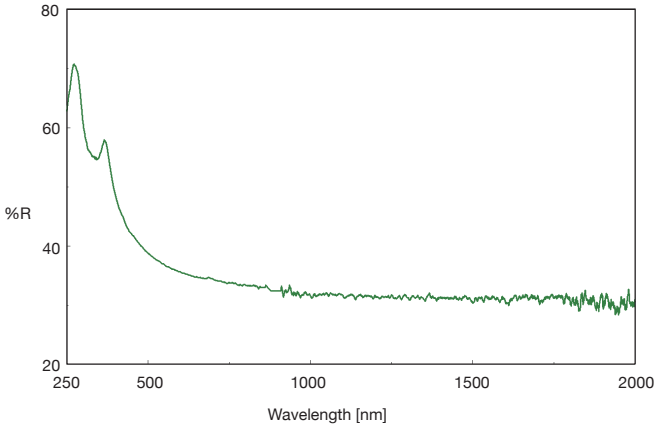
Optical system of MSV-5500/5700/5800

Transmittance/Reflectance measurement of a 10 µmϕ area in the UV-Visible/NIR region

The small measurement area can be used for the evaluation of semiconductor devices and optical elements, and also for R&D of functional materials.



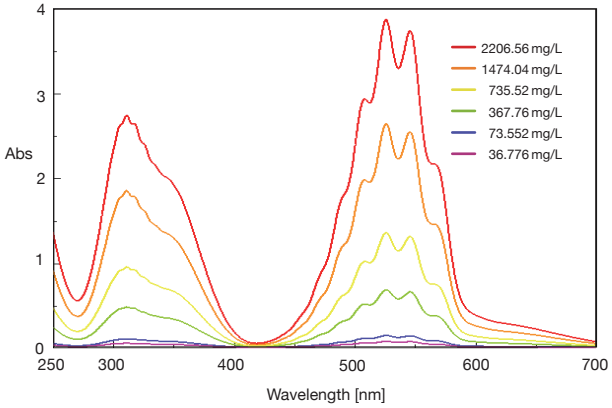
Observation view



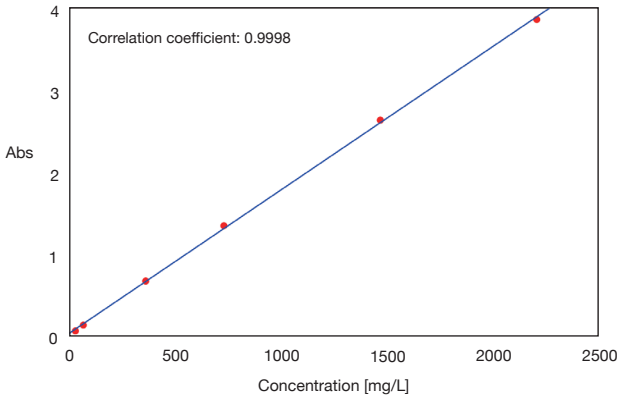
Reflectance spectrum of Silicon dioxide (SiO_2) on Si substrate

Excellent absorbance linearity

MSV-5500/5700/5800 micro-spectrophotometers, which irradiates the sample with the monochromatic light, can provide quantitative information that conventional microscope spectroscopy cannot. Dark correction function also enables the measurement of sample with high absorbance.



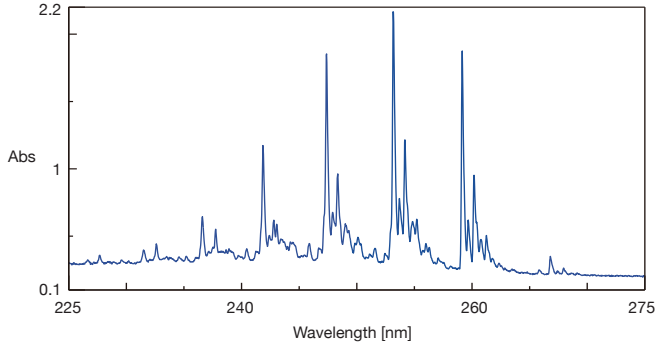
Absorption spectra of $KMnO_4$



Calibration curve

High wavelength resolution and accuracy

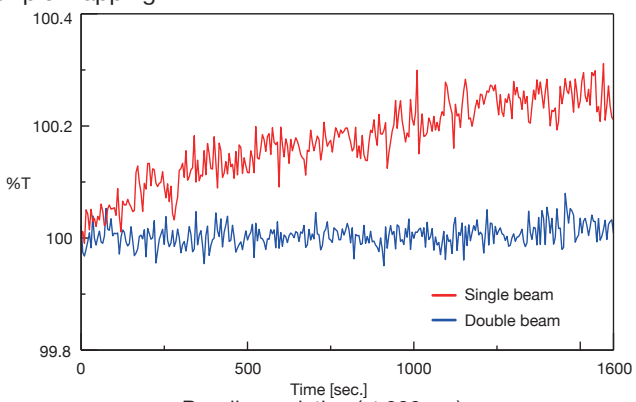
The optical system in the MSV-5500/5700/5800 utilizes a Czerny-Turner mount monochromator, which is well suited to the measurement of spectra that include transitions with narrow bandwidths. For example, the absorption spectrum of gas samples with consecutive sharp peaks can be obtained at high resolution (bandwidth: 0.1nm), and for the samples with absorption that varies significantly across a narrow wavelength range (such as color filters).



Absorption spectrum of benzene gas (filled in 1 mm cell)

Photometric stability by double beam optics

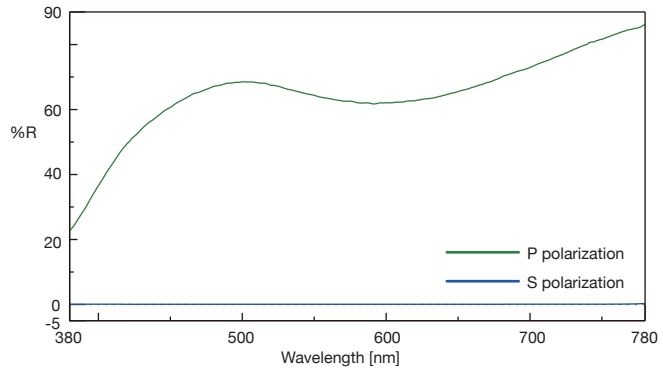
Double-beam optics allow the monitoring of light through the sample and reference simultaneously; this reduces fluctuations in the measured photometric value, providing a more accurate and stable long-term measurement such as time course of sample mapping.



Baseline variation (at 200 nm)

Polarization measurement function (standard)

The optical system includes a Glan-Taylor polarizer as standard, this can be used to make polarized transmission and reflection measurement. The polarizer and its orientation are software controlled and enable automatic measurement of S- and P-polarizations.

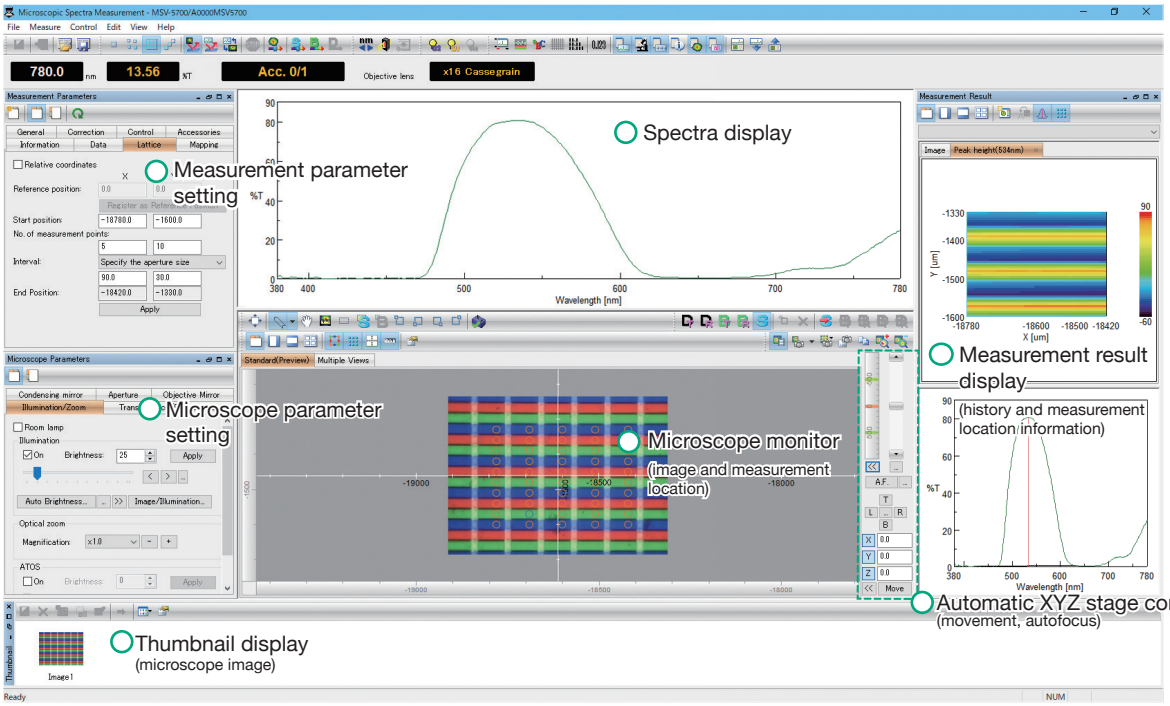


Transmittance measurement of polarization plate

User-friendly operation and observation

[Microscopic Spectra Measurement] program

The [Microscopic Spectra Measurement] program displays all of the parameter settings and measurement results on a single screen, together with the current status of the instrument and sample. Control of the automatic XYZ stage is also made here for performing multi-point and mapping measurements.



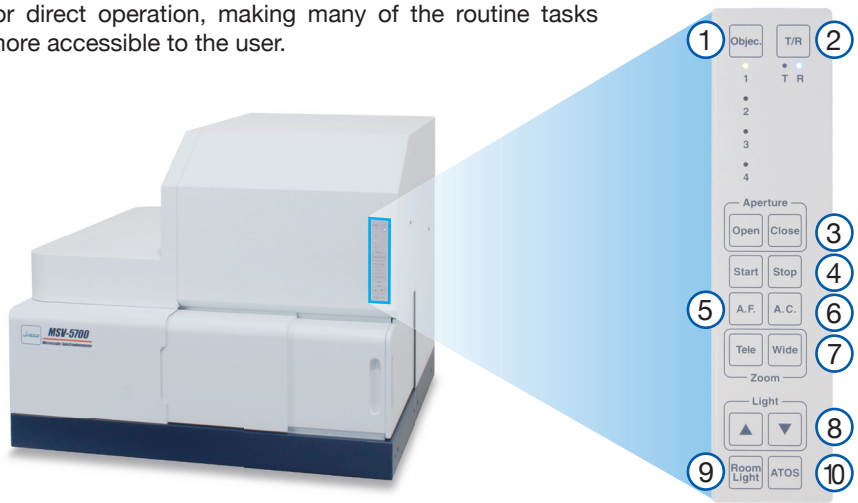
[Microscope Spectra Measurement] program

Large sample compartment

The large sample compartment with shading door provides ‘easy-to-see’ operation, making it simple to mount the sample, and eliminates external light from the measurement environment.

Control panel

The front panel of the microscope includes a control panel for direct operation, making many of the routine tasks more accessible to the user.



1. Objective mirror (lens) switching
2. Measurement mode switching (transmittance/reflectance)
3. Aperture switching
4. Measurement start/stop
5. Autofocus
6. Auto-correction of transmittance focus
7. Optical zoom
8. Brightness control of observation light
9. Sample compartment illumination (ON/OFF)
10. ATOS illumination (ON/OFF)

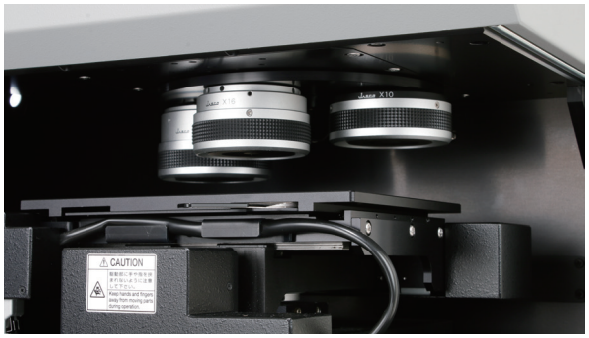
Observation function for defining the measurement position

The high-resolution observation camera in the microscope displays a clear image on the PC monitor, and is combined with JASCO's unique ATOS function, the measurement aperture is projected onto the sample for accurate positioning prior to spectral measurement.

※ ATOS = Aperture Through Optical System

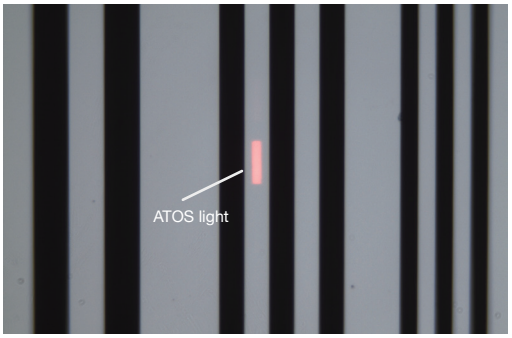
4-position motor-driven revolver

Up to 4 cassegrain objectives (or refractive objective lenses) can be mounted on the automatic revolver. Observation and measurement of the sample can be made using different magnifications, helping the user to identify and set the measurement point with great accuracy.



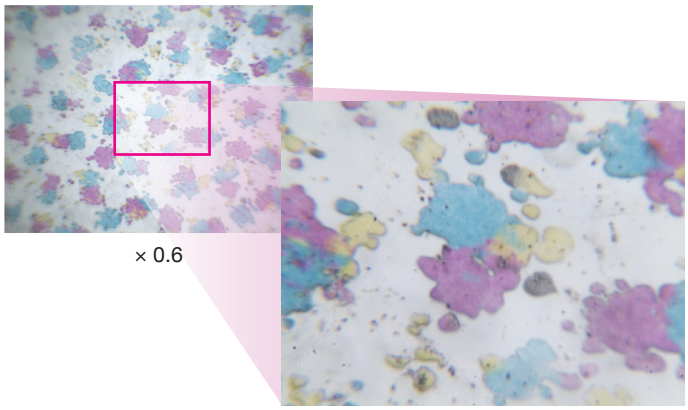
Observation of measurement point by ATOS function

ATOS projects an optical image of the photometric aperture onto the sample's microscope image; this provides the user with a visual reference point of the measurement position.



Optical zoom

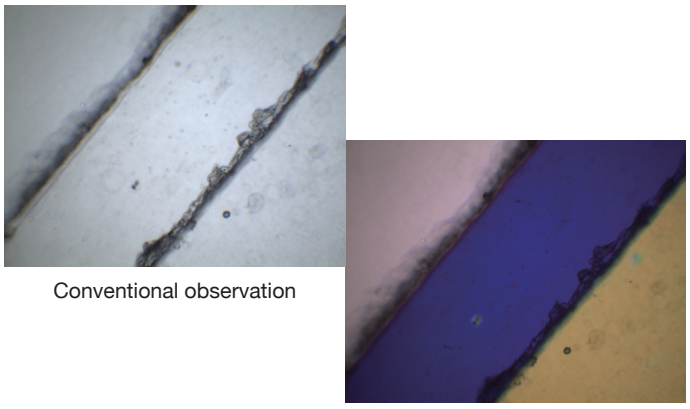
The observation magnification can be increased or decreased using optical zoom without switching the objective lens.



Observation view (ink on transparent film)

Polarization observation

Polarization observation can be used to exploit the differences in a sample's polarization to improve visualization using color, even when the sample appears colorless and transparent.



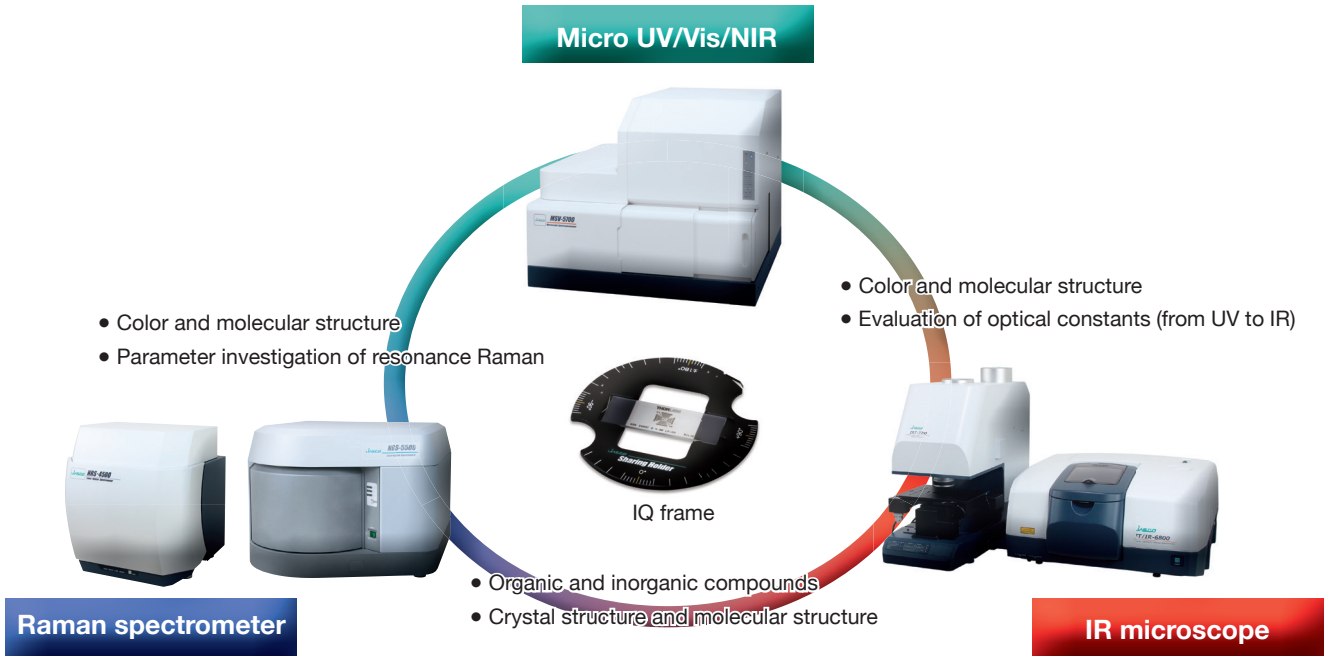
Conventional observation

Polarization observation (MPLV-512)

Observation view (piled resin tapes)

IQ frame

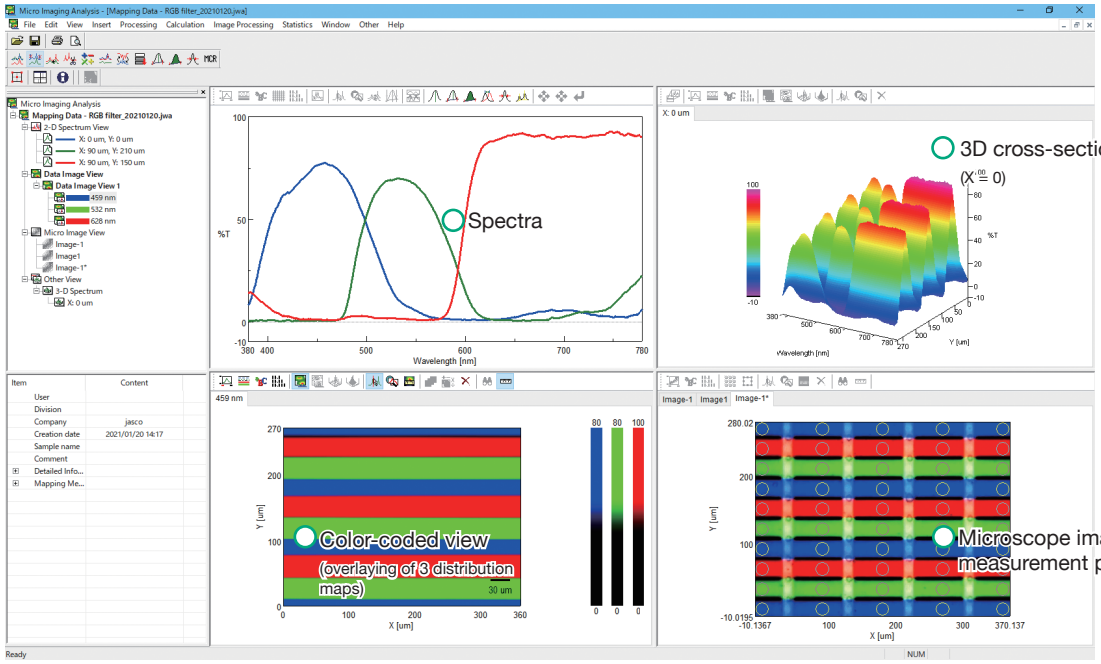
Using IQ frame the sample can be moved between different microscopes such as IR, Raman and UV/Vis-NIR to provide measurement and analysis at exactly the same position for correlating and comparing data from different spectroscopic techniques.



Analysis program

Micro imaging analysis

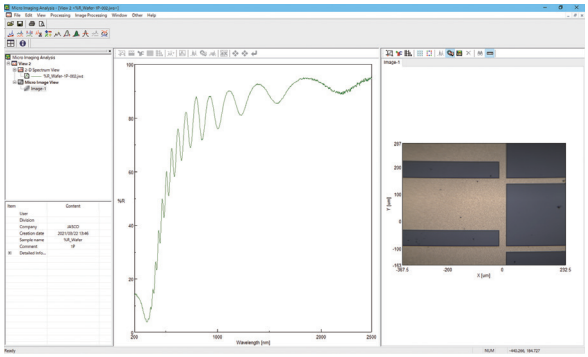
The [Micro Imaging Analysis] program is used to analyze the data from any of the measurement modes, including spectra acquired from single, multi-point or mapping. As standard, many data processing functions are included (such as peak detection, peak height/area calculation, etc.). Also included are two standard application programs for color analysis and film thickness analysis. Mapping measurement data can be visualized easily using image views (such as color 3D view, contour view, color-coded view, etc.), and a single spectrum can be selected from the mapping data for further analysis, saving or export as an individual data file.



[Micro Imaging Analysis] program

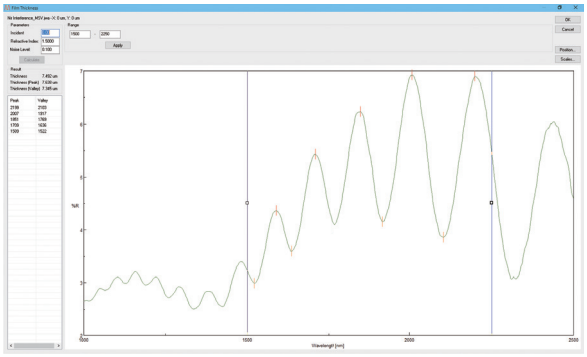
Data processing

Peaks can be identified automatically, and peak heights can also be calculated.



Film thickness calculation

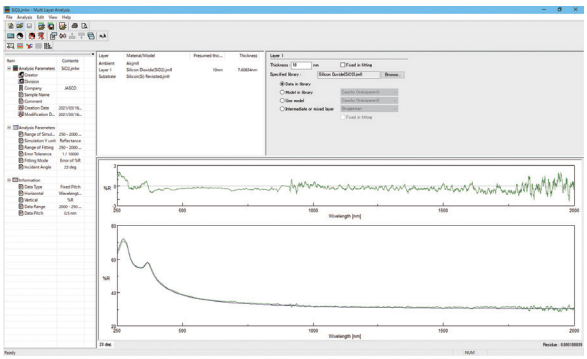
Film thickness can be calculated from the wavelength of the interference fringes in a sample spectrum.



Optional software

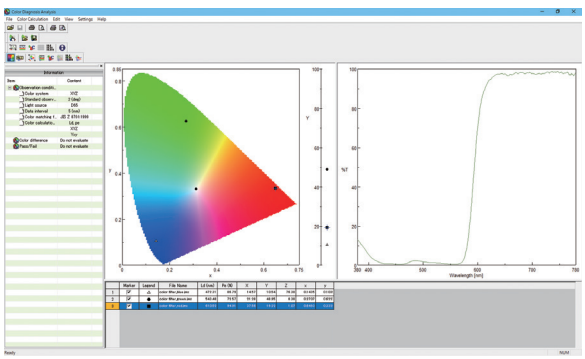
[Multi Layer Film Thickness Analysis] program

Advanced analysis can be made for the calculation of thickness and optical constants (n, k) in multi-layer films.



[Color Diagosis] program

Color calculation can be made using one of the standard methods to define color coordinates, the results are also plotted on a color system graph (chromaticity plot), and pass/fail evaluation against standard values is also included.



Accessories

Polarization light observation unit / MPLV-512

The use of polarized light can improve the visualization of samples that are difficult to observe using simple conventional observation (such as crystals and minerals).

* For polarization observation using binocular, MPLV-512 and MPLB-513 are required.

Binocular unit / MBNO-611

It can be used for visual operation and includes a 10× eyepiece (with ocular micrometer).

Analyzer / MANL-531

The analyzer is mounted between the sample and detector, and can be used for extracting the linear polarization component from the measurement light through the sample. It is built into the MSV-5500/5700/5800, and is software controlled.

[Specification]
Measurement mode: transmission, reflection
Prism: Glan-Taylor

Cassegrain objective lenses

There are three levels of magnification provided by the cassegrain objective lenses - 10×, 16× and 32×. For transmission measurement, the magnification of objective cassegrain should match the condensing cassegrain.

- MCAO-521 Objective cassegrain (10×)
- MCAO-523 Objective cassegrain (16×)
- MCAO-525 Objective cassegrain (32×)
- MCAC-522 condensing cassegrain (10×)
- MCAC-524 condensing cassegrain (16×)
- MCAC-526 condensing cassegrain (32×)

Objective lenses

For measurement

Wavelength range: 380 to 780 nm

- Objective lens 5× (Long working distance type)
- Objective lens 10× (Long working distance type)
- Objective lens 20× (Long working distance type)
- Objective lens 50× (Long working distance type)
- Objective lens 20× (Super long working distance type)
- Objective lens 50× (Super long working distance type)

For observation

- MLNV-514 Objective lens 10× (for observation)
- MLNV-515 Objective lens 20× (for observation)

Bench / MBNC-691

Dedicated support bench for the MSV-5500/5700/5800.

150W Xe lamp / MXLS-541

The optional 150 W Xe lamp is brighter than the standard lamp, it can be used for the measurement of samples that requires a more intense source of light in the UV region.

* 3 light sources (standard D_2 lamp, WI lamp and Xe lamp) cannot be used simultaneously.

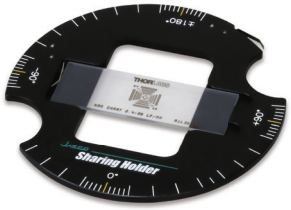
Automatic XYZ stage / MAXY-601

The auto-stage provides additional functions that are not available with the manual stage, such as mapping measurement, multi-image acquisition, autofocus, etc.

[Specification]
- Movable distance: X: 72 mm, Y: 52 mm, Z: 25 mm (1 µm step)
- Maximum load: 5 kg (maximum), 500 g (standard)

IQ frame / SH02-UV

IQ frame is used with the automatic XYZ stage, and can automatically move the measurement position to one previously measured by an IR microscope or Raman spectrometer also fitted with IQ Frame.



Joystick / MJYS-602

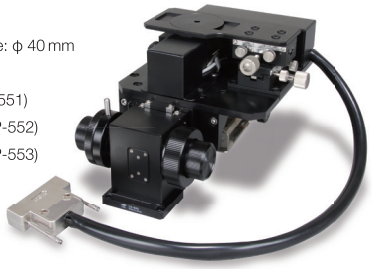
The joystick is used to manually control the automatic XYZ stage in addition to the keyboard and mouse.

[Specification]
- Automatic XYZ stage control: X, Y and Z axes control

Integrating sphere unit / MISP-551/552/553

The Integrating sphere unit is used for diffuse transmittance measurement; it is typically used for samples that diffuse transmitted light, and for lens type samples

[Specification]
- Inside diameter of integrating sphere: ϕ 40 mm
- Wavelength range:
  250 to 850 nm (MISP-551)
  250 to 2000 nm (MISP-552)
  250 to 1600 nm (MISP-553)



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