C101-E121E

SHIMADZU
Excellence in Science

UV-VIS Spectrophotometers

UV-2600/2700

Experience the Precision Desired, in Any Situation

UV-2600/2700

UV-VIS Spectrophotometer

Single monochromator UV-2600

Capable of a Measurement Wavelength up to 1400 nm

- Equipped with a single monochromator, providing low noise performance across a wide wavelength range
- Enables near-infrared measurements (up to 1400 nm)*

* When the optional ISR-2600Plus integrating sphere is used

Double monochromator UV-2700

Performance with a Minimum 8-Abs Photometric Range

- Equipped with an ultra-low stray light double monochromator, capable of 8-Abs measurements
- Uses the Shimadzu proprietary Lo-Ray-Ligh™ grade diffraction grating

Even More Compact and User-Friendly

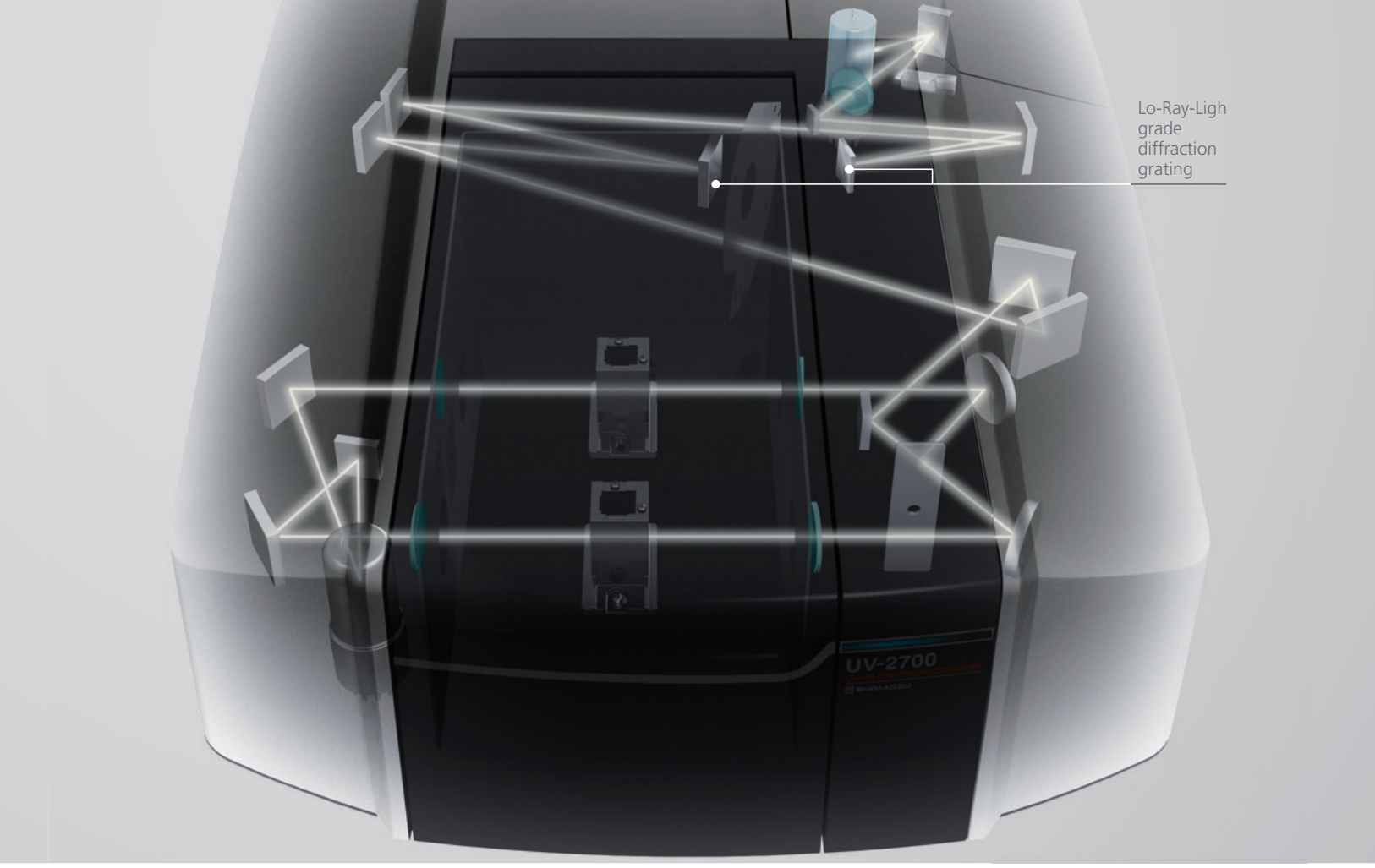
- A compact 450 mm width size, reducing the required installation space by 28 %*
- Achieves 10 %* energy savings compared to other Shimadzu systems

* In comparison to the conventional UV-2450/2550 models

- Validation software is included as standard

With a Wealth of Accessories, Accommodates Every Application

- Freely expandable to suit the measurement objective
- Existing system accessories can also be used
- Automated data processing

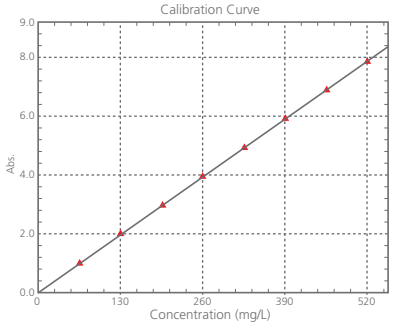


Achieves Ultra-Low Stray Light, Enabling 8-Abs Measurements

Conventional models provide 5-Abs coverage. Even high-end models have been limited to 6 Abs. In contrast, the UV-2700 achieves ultra-low stray light levels, expanding the range to 8 Abs, with a transmittance value of 0.000001 % (1 part in 100 million). This system achieves high-level absorbance measurements with incomparable precision. In addition to measuring even high-concentration samples as is, eliminating the need to dilute samples, the system can be applied to evaluating the transmission characteristics of polarization films.
Wavelengths in the 400 nm to 650 nm range can be measured to 8 Abs.

Absorbance Linearity

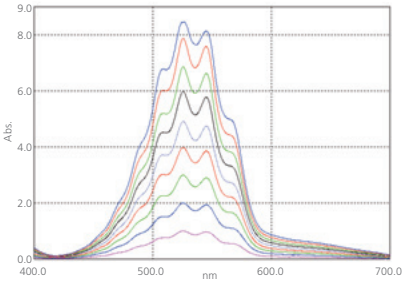
UV-2700



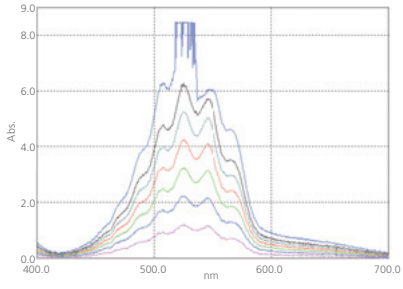
This shows the relationship between the absorbance and the concentration of an aqueous potassium permanganate solution. Good linearity is evident to 8 Abs.

Spectral Comparison of Aqueous Potassium Permanganate Solutions

UV-2700



UV-2700



UV-2550 (Conventional Model)

This spectrum is measured from an aqueous $KMnO_4$ (potassium permanganate) solution. Unlike conventional models, this system is capable of high-level absorbance measurements.

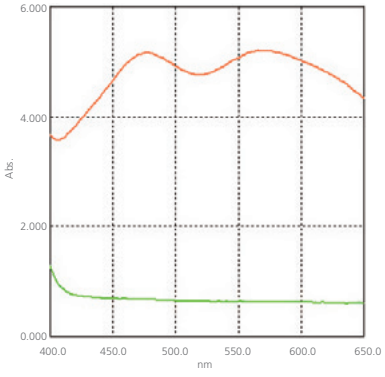
Double monochromator UV-2700

Performance with a Minimum 8-Abs Photometric Range

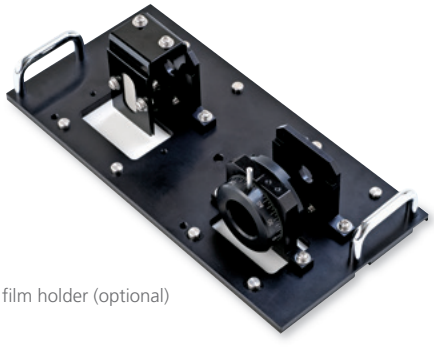
Equipped with a double monochromator that achieves ultra-low stray light levels, the UV-2700 is optimal for measuring low transmittance samples, such as polarization films used for LCD panels. The UV-2700 is capable of 8-Abs measurements, and can make accurate transmittance measurements to 1 part in 100 million, accommodating a variety of sample measurements.

Sample Polarization Film Measurement

UV-2700



With the rotating film holder (photograph below), two film samples can be set on the same optical axis. In this example, the polarization film is rotated in the plane, and the transmittance is measured when the film transmits and blocks light.



Rotating film holder (optional)

Equipped with Shimadzu's Proprietary Lo-Ray-Ligh Grade Diffraction Grating

Shimadzu's proprietary Lo-Ray-Ligh grade diffraction grating enables the high precision of the UV-2700. In the diffraction grating production process, new proprietary manufacturing methods have been developed for Shimadzu's holographic technology. By optimizing the etching process, we have successfully manufactured extremely low stray light diffraction gratings while maintaining high efficiency. With this a newly designed optical system equipped with a double Lo-Ray-Ligh monochromator, the UV-2700 achieves unparalleled ultra-low stray light levels.

LO-RAY-LIGH
Low Stray Light Diffraction Gratings

Single monochromator UV-2600

Capable of a Measurement Wavelength up to 1400 nm

A key feature of the UV-2600 single monochromator type is its measurement wavelength range. By using the optional ISR-2600Plus Integrating Sphere attachment, the measurement wavelength range can be extended from 220 nm to 1400 nm, significantly expanding its applications.

Integrating Sphere Enables Measurements to 1400 nm

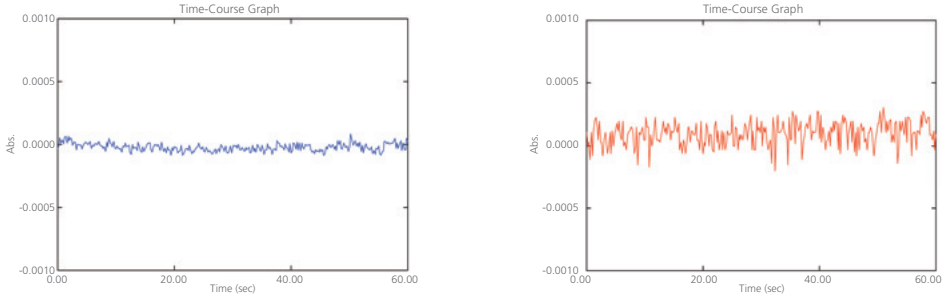
The UV-2600 is also equipped with Shimadzu's proprietary Lo-Ray-Ligh grade diffraction grating, which achieves high efficiency and low stray light levels. By installing the ISR-2600Plus two-detector integrating sphere, the 300 nm to 1100 nm wavelength range of conventional models can be extended to 1400 nm. In addition, the UV-2600 achieves a significant noise reduction, and can accommodate measurements of solar cell anti-reflective films and polycrystalline silicon wafers.

Wider Measurement Wavelength Range

UV-2600

Comparison of Data Noise Levels

UV-2600



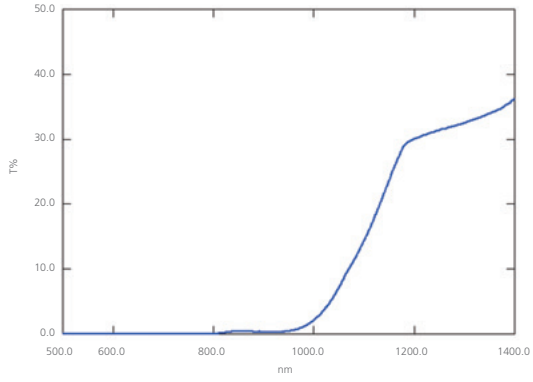
500 nm, 2 nm slit width, 0.2 sec sampling pitch, 0.2 sec integration time
UV-2600

500 nm, 2 nm slit width, 0.2 sec sampling pitch
UV-2450 (Conventional Model)

Noise levels are significantly reduced in comparison to the conventional UV-2450 model.

Transmission Measurements of Polycrystalline Silicon Using the ISR-2600Plus

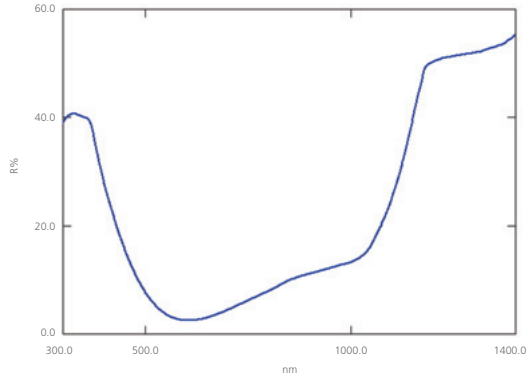
UV-2600



This is a transmission measurement of polycrystalline silicon. Since the system is capable of measurements to 1400 nm, the transmission characteristics of the band gap region (near 1000 nm) are clearly evident.

Relative Diffuse Reflection Measurements of an Anti-Reflective Film Using the ISR-2600Plus

UV-2600



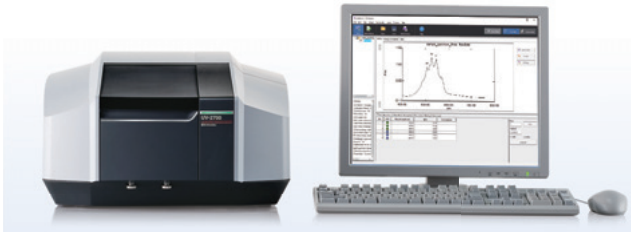
This is a reflection measurement of an anti-reflective film. With relative reflection measurements, the system can measure from the ultraviolet region up to the near-infrared region, so the suppressed reflectance in the visible region is clearly evident.

Compact 450 mm Width Size

With the space-saving UV-2600/2700 models, the sample compartment size remains the same despite a 20 % reduction in installation width. A variety of film and other measurements can be performed effortlessly, without sacrificing user-friendliness. In addition, the cooling fan is built into the side of the unit, so that it can be pushed back all the way to the wall. By placing in contact with the wall, limited bench space can be more effectively utilized.

Achieves 10 % Power Savings in Comparison to Conventional Models

The 190 VA power consumption of conventional models has been reduced to 170 VA. A 10 % energy saving makes the system more environmentally friendly.



Single monochromator UV-2600
Double monochromator UV-2700

Even More Compact and User-Friendly

To respond to feedback that conventional models are too large, we have challenged ourselves to maximize space savings. The installation space required for this system has been reduced by about 28 %, thanks to a brand new compact design. In addition, validation software is provided as standard, so equipment inspections are easily performed, further enhancing user-friendliness.

Validation Software Provided as Standard to Support GLP/GMP

Validation software assists with equipment performance checks and the logging of such checks. Validation software, which has been available as an option, is included as standard with the UV-2600/2700, thereby achieving easier instrument check. Equipment performance can be easily checked in daily inspections and when data accuracy becomes a concern.

- Inspection results can not only be printed, but also saved to a file, with results called up later for confirmation.
- Inspection conditions for each periodic and routine inspection can be saved as a file, and then called up for use.

- Equipment performance can be checked according to the performance indication standards specified in JIS K0115 "General rules for molecular absorptiometric analysis," as well as to Japanese Pharmacopoeia general test methods or various EP and USP inspection methods. (Inspection tools and reagents must be prepared separately.)

- Mercury bright line wavelength checks can be performed using the optional low-pressure mercury lamp unit.

Single monochromator UV-2600
Double monochromator UV-2700

With a Wealth of Accessories, Accommodates Any Application

The functionality of the UV-2700/2600 can be freely expanded to suit the measurement objective. By accommodating a wealth of accsesories, the system can address any user's applications and a variety of situations. Thanks to intuitive operations, anyone can easily obtain the data required.

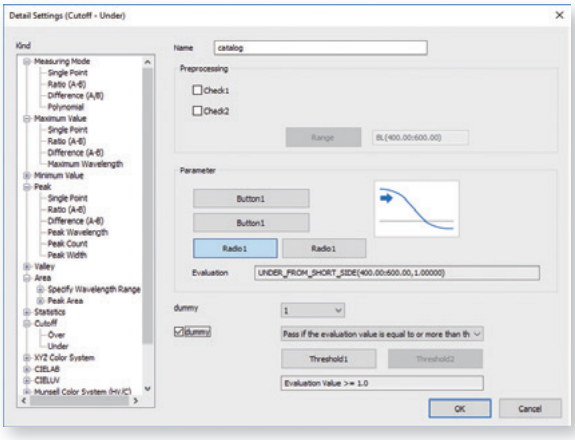
	UV-2600	UV-2700
Electricity, Electronics, and Optics		
High-level absorbance measurements for polarization films	F	E
Absolute reflectance measurements for anti-reflective films	E	F
Transmittance measurements for functional films	E	E
Transmittance measurements for solar cell cover glass	E	F
Band gap measurements and diffuse reflectance measurements for semiconductor materials	E	F
Absolute reflectance measurements for highly reflective mirrors	E	F
Chemicals		
Transmittance and reflectance measurements for various types of films	E	F
Thin film thickness measurements	E	E
Plastic transmittance measurements, reflectance measurements, and color measurements	E	F
Medicines, Cosmetics, and the Life Sciences		
Raw material confirmation tests	E	E
Enzyme reaction measurements	E	E
Protein and nucleic acid quantitation	F	E
Cosmetic color measurements and ultraviolet screening measurements	E	F

	UV-2600	UV-2700
Environment		
Hexavalent chromium quantitation	F	E
Quantitation of total phosphorus and total nitrogen in river water, lakes, and marshes	F	E
Turbidity measurements	E	F
Quantitation of iron, copper, arsenic, ammonia, and other substances in water	F	E
Construction		
Transmittance measurements for window glass and window glass films	E	F
Reflectance measurements for paints and building materials	E	F
Textiles		
Textile transmittance and reflectance measurements, and ultraviolet screening measurements	E	F
Textile color measurements	E	F
Foods		
Quantitation of vitamins, food additives, and minerals	F	E
Quantitation of phenols leached from containers and packing agents	F	E

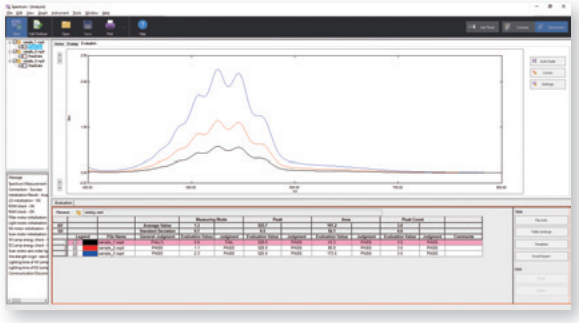
E: exellent F: fair

Automated Data Processing

After spectra are measured, the software can perform data processing automatically in conjunction with the raw data, and can then display the results.
Peak detection, data operations (such as smoothing, differentiation, and basic arithmetical operations), point picking, and area calculations can be selected for automatic data processing.



Measurements together with the data processing to execute can be configured on the [Operation] tab in the [Spectrum Method] window.



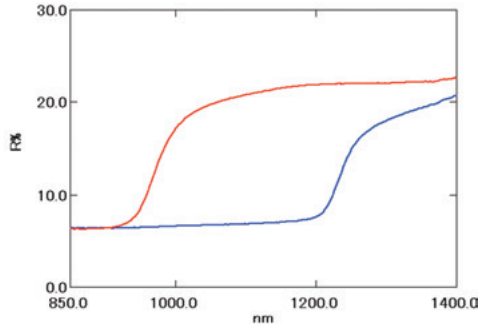
This example shows automated point picking after measurement. Data values for any wavelength can be shown onscreen.

Electricity, Electronics, and Optics — Band Gap Measurements for Compound Semiconductors

The diffuse reflection spectra for two types of compound semiconductors (red line: $CuIn_{0.5}Ga_{0.5}Se_2$, blue line: $CuInSe_2$) used as solar cell materials have been measured using the ISR-2600Plus integrating sphere. It is evident that the absorption edge (position where the reflectance drops) differs depending on the sample. This difference signifies a difference in the band gap* for these samples. (The samples were provided by Wada Laboratory, Faculty of Science and Technology, Ryukoku University.)

The band gaps for the samples were calculated utilizing the Tauc method. The results obtained were 1.27 eV for $CuIn_{0.5}Ga_{0.5}Se_2$ (red line) and 0.99 eV for $CuInSe_2$ (blue line).

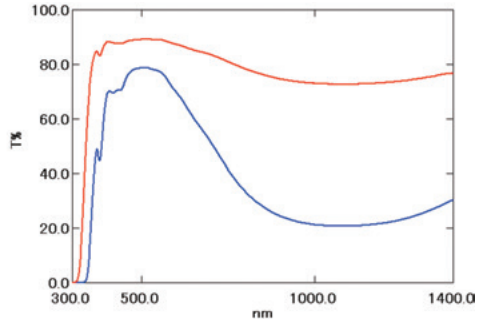
* The term band gap refers to the energy difference between the top of the valence band, which is full of electrons, and the bottom of the conduction band, which does not contain electrons.



Construction — Window Glass Transmission Measurements

Two types of window glass were measured utilizing the ISR-2600Plus integrating sphere.

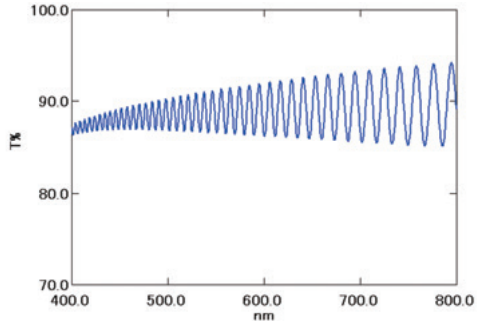
The sample shown by the red line is highly transparent to near-infrared light at 800 nm or more. The sample shown by the blue line, however, is apparently not very transparent to near-infrared light.



Chemicals — Thickness Measurements of Cling Films

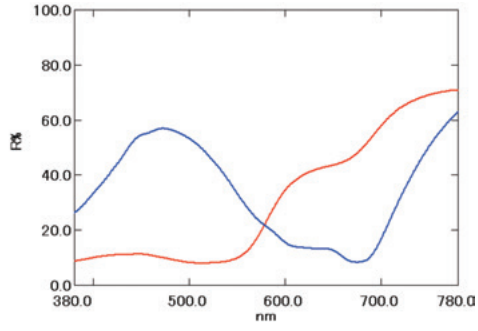
Undulating interference waveforms sometimes occur if light is passed through a film. The film thickness of a sample can be determined by using these interference waveforms. The figure shows transmittance data for a cling film. A clear interference waveform is produced. Utilizing optional film thickness measurement software, the film thickness is calculated as 10.4 µm.

(Caution) The sample's refractive index must be entered for the film thickness calculation.



Textiles — Diffuse Reflection Measurements of Various Cloths

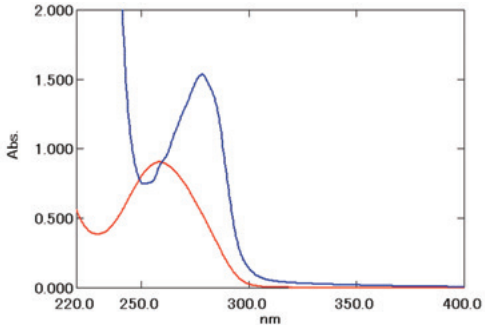
The diffuse reflection spectra for various textiles were measured in the visible range utilizing the ISR-2600Plus integrating sphere. The blue line indicates a blue cloth, and the red line a red cloth. The blue cloth appears blue because it primarily reflects short-wavelength blue light. The red cloth appears red because it primarily reflects long-wavelength red light.



Life Sciences — DNA and Protein Measurements

The red and blue lines are the absorption spectra for dsDNA and BSA (bovine serum albumin), respectively.

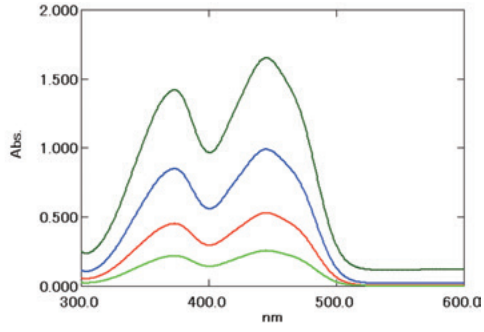
The concentration values are 45 ng/µL for dsDNA and 2.2 mg/mL for BSA.



Foods — Vitamin Measurements

This shows the absorption spectra for riboflavin (vitamin B_2).

The sample concentrations are, in order from the highest absorbance, 0.08, 0.04, 0.02, and 0.01 mg/mL.



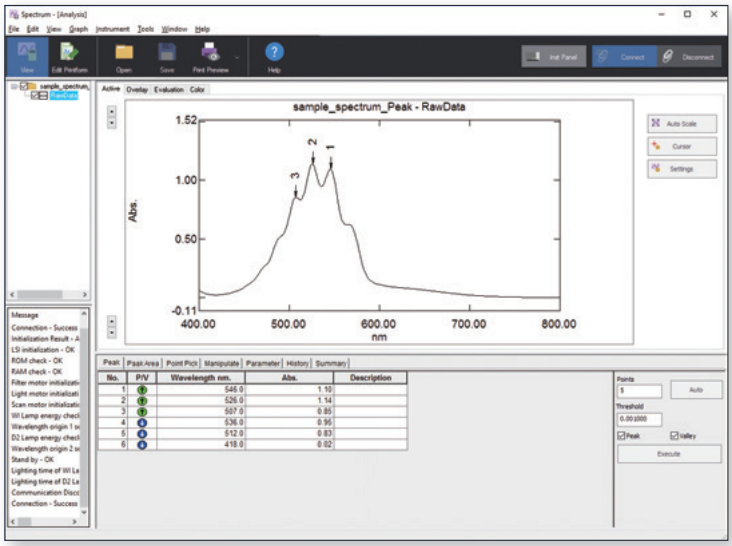
Optional Software

Control with LabSolutions UV-Vis Software

The UV-2600/2700 can be controlled using LabSolutions UV-Vis software. LabSolutions UV-Vis is a next-generation Shimadzu UV control software pursuing efficiency of analysis. The simple design layout enables even first-time users to perform operations easily. A new spectrum evaluation function automates the measurement, analysis, and printing of reports to significantly enhance the efficiency of routine analysis. In addition, it achieves the easy transfer of measurement data. Users can export the measurement data in text format and import it into other software for analysis with Excel®.
(A separate USB cable is required to connect with a computer.)
For more details, refer to LabSolutions UV-Vis brochure (C101-E147).
Note: LabSolutions UV-Vis is the latest optional software. UV-2600/2700 is equipped with UVProbe software as standard.

Simple Design

From the start, the software's user-friendliness allows users to perform operations with ease.
With extensive features, LabSolutions UV-Vis meets a wide range of users' expectations.



Simple Main Window
Clear and simple layout of the graphs and measurement results makes it easy to read.

Instrument Control Panel
The instrument control panel that brings together the measurement functions enables automatic measurement, analysis and reporting.

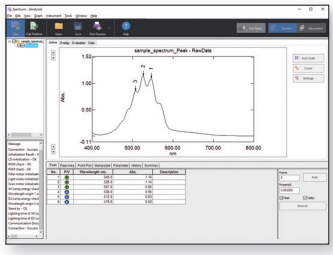
Easy-to-follow Configuration Window
Large icons make it easy for users to understand and operate.

Four Measurement Modes

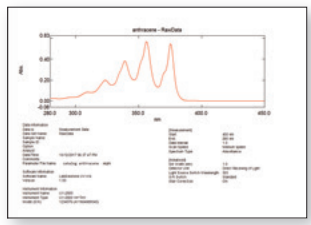
It permits four measurement modes: spectrum, quantitative, photometric, and time course.
Users can open multiple measurement modes at the same time, so that data analysis can be performed in one mode while collecting data in another mode.

Report

Easily create report layouts.



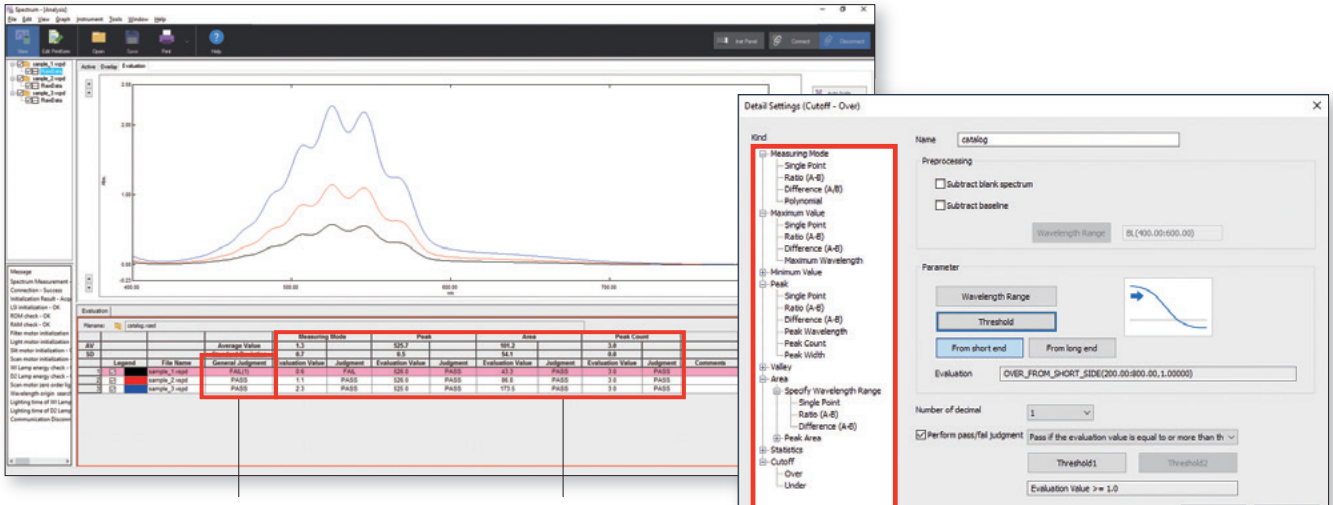
Print from the measurement window with one click.



Report is printed.

Spectra Evaluation Function

In addition to providing measurement and analysis results, judgment results are also provided.
With this feature, LabSolutions UV-Vis enables users to maintain a product's quality.



Quality of the sample can be determined with comprehensive judgment at a glance.

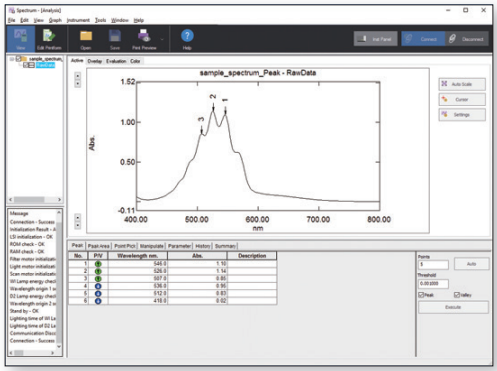
Multiple evaluation criteria can be set.

Detail Settings Window

Evaluation method can be selected from a wealth of choices.

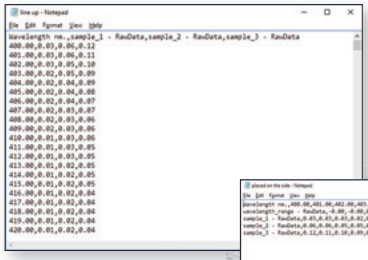
Easy Transfer of Measurement Data

Users want to export measurement data immediately in text format, and import for analysis in other software, such as Excel.

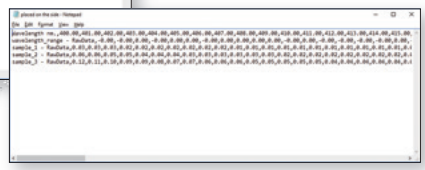


Matrix Output

Outputs multiple spectra to one text file.
Easy to import data into multivariate analysis software.
Line up wavelengths vertically.



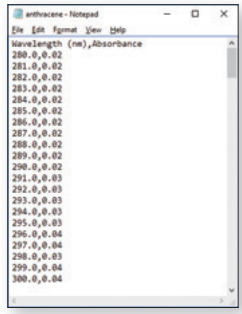
Line up wavelengths horizontally.



Select how the data is ordered

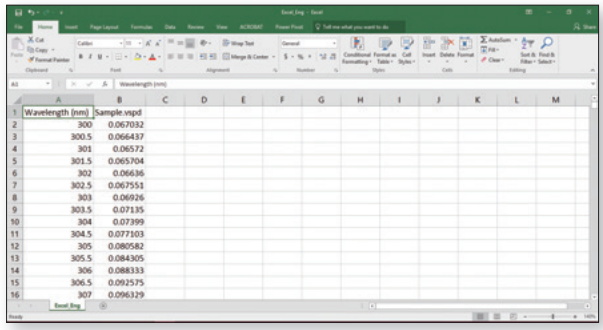
To Analysis Software

Automatically generates a text file when the spectra data are saved. It can be immediately imported into other software.



To Excel

Real-time transfer of the spectrum waveform to Excel during measurement.
No need to create a CSV file each time.



Optional Software

Data Integrity Solutions Achieved with LabSolutions DB/CS System

Reliable LabSolutions Software

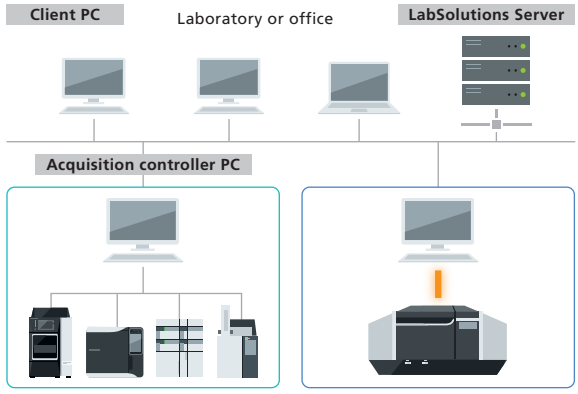
Shimadzu offers LabSolutions DB UV-Vis and LabSolutions CS UV-Vis* to meet the requirements of ER/ES regulations.

LabSolutions DB UV-Vis

LabSolutions DB UV-Vis System can be established by introducing the database system. The system allows for data management and user management with a database. Compliant with ER/ES regulations, the system is optimally configured for customers using a PC.

LabSolutions CS UV-Vis*

UV-Vis can be added to LabSolutions CS as an acquisition controller. The system is optimally configured for customers who want to manage data on a server together with LC and GC data for ER/ES compliance.

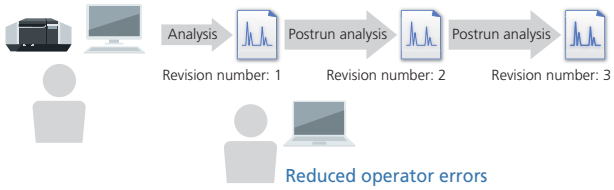


* coming soon

Name	LabSolutions UV-Vis	LabSolutions DB UV-Vis System	LabSolutions CS UV-Vis System
Data management method	Measured data files are saved and managed in folders on the PC.	Measured data files are saved and managed in the LabSolutions database.	
Data references	The software references files on drives or in folders on the PC.	The software references files in the database.	
LabSolutions database	Unavailable	Available (The database resides on a local PC)	Available (The database resides on a server)
User administration	Unavailable	Available	
Rights group administration	Unavailable	Available	
Project administration	Unavailable	Available	
Standalone/network	Only the standalone configuration can be used.	Only the standalone configuration can be used.	Only databases on the network can be used. (LabSolutions UV-Vis data can be viewed using the database manager on a PC set up for viewing purposes. Note that LabSolutions UV-Vis must be installed on the PC used for viewing.)
Data backup	Performed on a file-by-file basis using Windows Explorer.	Performed for each database.	

Database Management Prevents Mistakes

With LabSolutions DB UV-Vis System and LabSolutions CS UV-Vis System, the analysis data are managed securely by the database. Overwriting, deletion and other mistakes typical of data file management do not occur.
In addition, when postrun analysis is performed using the acquired data, postrun analysis data revision numbers are automatically assigned, preventing the accidental overwriting of raw data.

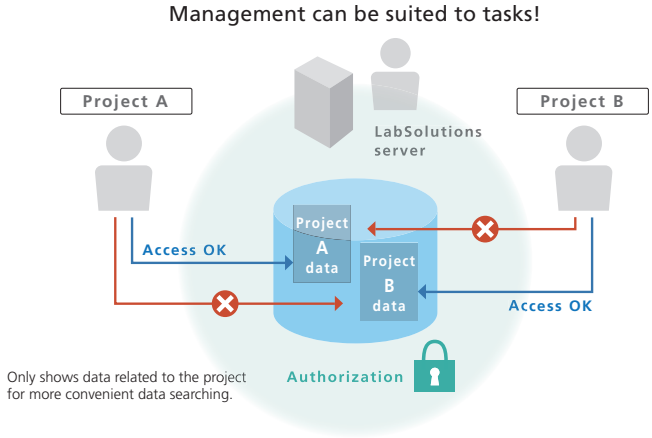


Solid Security

An audit trail to ensure the reliability of data and document e-mail transmission functions when any event occurs in the system can be set up. User accounts are managed using passwords, where password length, complexity and term of validity must satisfy specified requirements. It is also possible to set lockout functions to prevent illegal access, and set a registered user's deletion and change. In addition, a box can be selected to prevent overwriting a data file, and outputting an item to a report can also be performed.

Pertinent Information Managed for Every Project

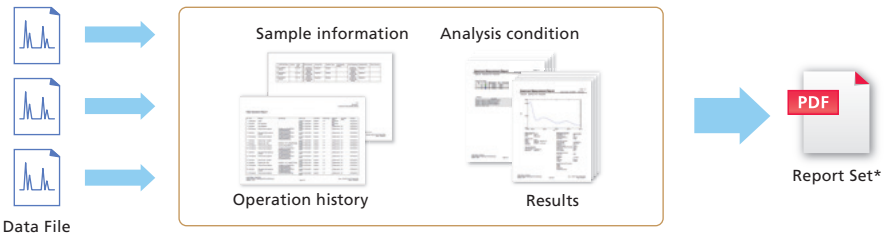
LabSolutions DB UV-Vis System and CS UV-Vis System provide a project management function enabling management suited to tasks and system operations. This function enables equipment and user management, security policy, and data processing to be set on a project-by-project basis, thereby improving the efficiency of data searches and management tasks.



Visualization of the Sequence of Analysis Operations

Creating a report set* provides visibility of the individual analytical operations involved in the overall analytical process. When analytical operations are visible, it is easier to check for operating errors, which helps improve the efficiency and reliability of checking processes.

* Report sets include test methods and test results for a series of samples analyzed, and also a corresponding operation log (a record of all operating events from login to logout), which is automatically extracted from the data and summarized in a single report.

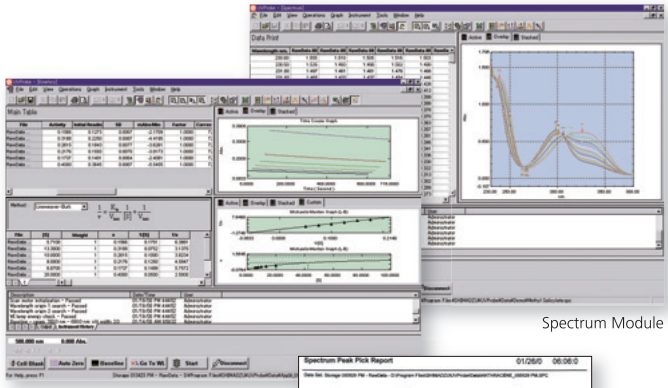


Standard Software

Control with UVProbe Software

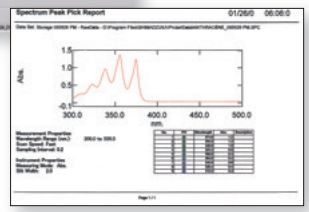
UVProbe software contains the following four functions, each of which can be performed easily with its own screen.Spectrum ModulePhotometric Module (Quantitation)Kinetics Module (Time Course Measurement)Report GeneratorIn addition to peak detection, area calculation and other data processing functions, UVProbe is equipped with various functions including: security functions that limit each user limited to specific functions, a data history log function, and aninstrument audit trail function.

The report generator gives you the freedom to arrange graphs, tables, etc. to suit your needs. Pasting labels on graphs and editing text is easy, allowing you to effectively print comments along with the analysis results.



Spectrum Module

Kinetics Module



Report Generator

Optional Software

LabSolutions™ Connection Kits

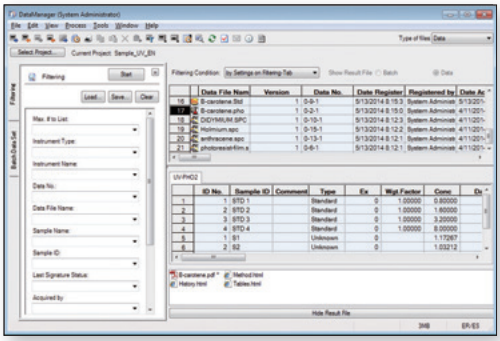
LabSolutions DB Connection Kit

(P/N 207-21250-92/93)

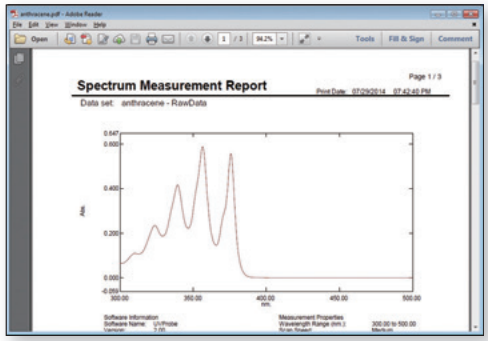
LabSolutions CS Connection Kit

(P/N 207-21251-92/93)

This software is used to perform operations such as automatically registering data obtained and processed using UVProbe and PDF report files in a LabSolutions database, securely managing data, or applying electronic signatures. Consequently, this kit allows for making UVProbe compliant with FDA 21 CFR Part 11.
It also provides network capability, which allows you to use the network server to centrally manage data from other analytical instruments, such as HPLC, GC, or FTIR systems, by installing software that is compatible with such equipment. It even allows you to view the data from a client computer on the network.



LabSolutions Data Manager



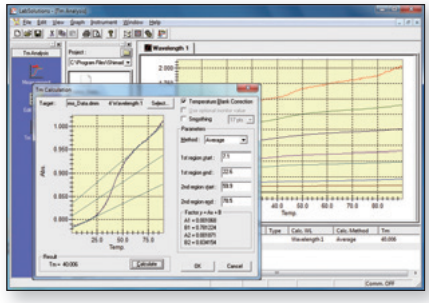
PDF Report of Data

Tm Analysis Software

(P/N 206-57476-91)

This software accumulates temperature and absorbance curve data at the PC to analyze the Tm (melting temperature) of nucleic acids such as DNA and RNA.

(Note) A RS-232C cable (P/N 200-86408) connected the PC to the S-1700 thermoelectric single-cell holder and a square cell with stopper (P/N 200-34444) are needed separately.



Optional Software

Color Measurement Software

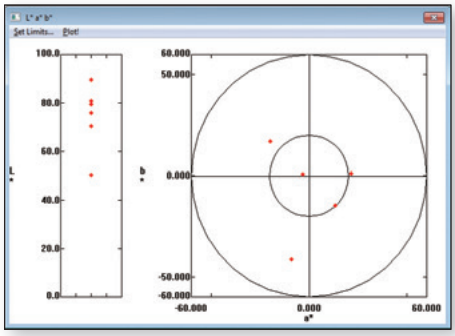
For UVProbe

(P/N 206-65207)

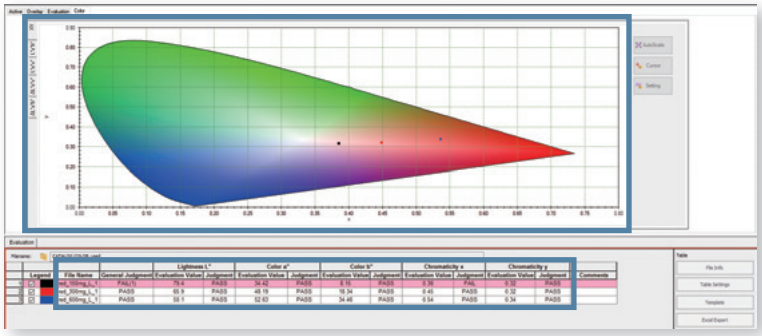
For LabSolutions UV-Vis

(P/N 207-24528-91)

- Available Calculation Values
  Tristimulus values (X, Y, Z), chromaticity coordinates (x, y), CIELAB scale/color difference formula, yellowness index/yellowing factor, whiteness, Munsell, metamerism, CIELAB-based three attributes and their difference, primary wavelength, excitation purity, etc.
- Extensive convenient graphical functionality, such as chromaticity diagram and color difference diagram functions.
- Freely selectable field of view (2° or 10°) and Illuminant (JIS regulations <for UVProbe and LabSolutions UV-Vis> and ASTM regulations <for LabSolutions UV-Vis>).
- Correction can be calculated by specifying standard white plate values.
- Color differentials can be calculated for any specified reference sample.
- Mean and standard deviation values can be calculated for multiple sets of data.



(For UVProbe) Lab Chromaticity Diagram Display Window



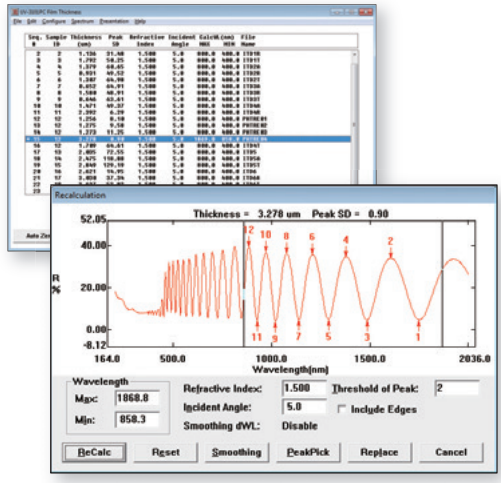
(For LabSolutions UV-Vis) XYZ Chromaticity Diagram Display Window

Film Thickness Measurement Software

(P/N 206-66877)

This software measures the thickness of thin films from the wavelengths of peak (or valley) interference waveforms overlapping the spectrum. The film thickness is measured through optical methods without physical contact.

- The film thickness is calculated from linear regression by applying the method of least squares to the wavelengths of the multiple peaks and valleys automatically detected. (The thin film's refractive index and the angle of incidence must be configured as calculation conditions.)
- The calculation conditions can be changed with respect to the measured spectra, enabling recalculation.
- A range can be set for use in the calculations while checking the spectral interference waveform onscreen.
- The measurable film thickness range is (minimum measured wavelength)/n to 50 × (maximum measured wavelength)/n. (Reference value)



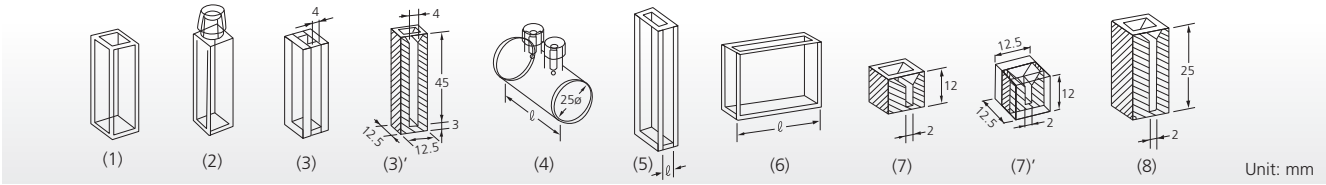
Recalculation window

Accessories (Options)

Solution Measurement/Instrument Options

Cells

Description	Optical Path (L)	Required Sample Volume	Type	Fused Silica (S)
Square cell	10 mm	2.5 mL to 4.0 mL	(1) *1	200-34442
	20 mm	5.0 mL to 8.0 mL	(6)	200-34446
	50 mm	12.5 mL to 20.0 mL		200-34944
	100 mm	25.0 mL to 40.0 mL		200-34676
Square cell with stopper	10 mm	2.5 mL to 4.0 mL	(2)	200-34444
Semi-micro cell	10 mm	1.0 mL to 1.6 mL	(3) *2	200-66501
Semi-micro black cell	10 mm	1.0 mL to 1.6 mL	(3)' *2	200-66551
Supermicro black cell	5 mm	25 µL to 100 µL	(7)' *3	208-92116
	10 mm	50 µL to 200 µL	(7) *3	200-66578-11
Micro black cell	10 mm	50 µL to 400 µL	(8) *3	200-66578-12
Cylindrical cell	10 mm	3.8 mL	(4)	200-34448 (silica window)
	20 mm	7.6 mL		200-34472 (silica window)
	50 mm	19.0 mL		200-34473-01 (silica window)
	100 mm	38.0 mL		200-34473-02 (silica window)
Short path cell	1 mm	0.3 mL to 0.4 mL	(5)	200-34660-01
	2 mm	0.5 mL to 0.8 mL		200-34655
	5 mm	1.3 mL to 2.0 mL		200-34449



(Note) *1 If a cap is required for 10mm square cells, purchase a cap (P/N 200-34565-02).
*2 With a 5 nm slit, the cell holder with micro cell mask (P/N 204-06896) is required.
*3 The supermicro cell holder (P/N 206-14334) is required.

Ultramicro Volume Measurement

Recommended for small-volume and precious sample, such as in biological applications. Trace quantities (on the order of a few µL) can be measured by combining the instrument with NanoStick, TrayCell and capillary cell set. It can be set to a standard 10 mm square cell holder.

TrayCell


NanoStick

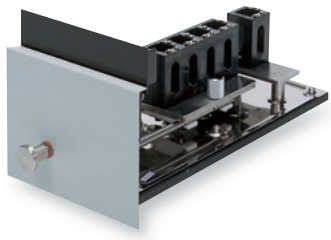
Capillary Cell Set

Four-Cell Sample Compartment Unit (P/N 206-23670-91)

Accommodates 4-cell holders of various types.

- Incorporates a 4-cell holder for 10-mm square cells.

(Note)
Square cells are not included as standard.
Please purchase separately.

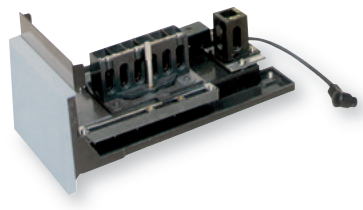


Multi-Cell Sample Compartment (P/N 206-69160-41)

Holds up to six 10-mm square cells on the sample side. No temperature control capability.

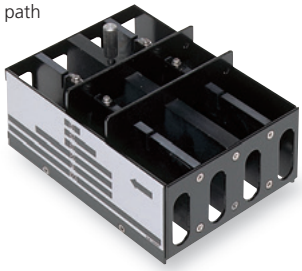
- Number of cells:
  6 on the sample side
  1 on the reference side

(Note)
Square cells are not included as standard.
Please purchase separately.



Universal Rectangular Cell Holder, Four-Cell Type (P/N 204-27208)

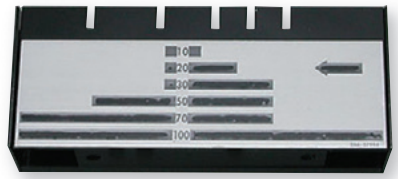
Holds four rectangular cells with an optical path length of 10, 20, 30, 50, 70, or 100 mm.



(Note)
The Four-Cell Sample Compartment Unit (P/N 206-23670-91) is required. When a rectangular, long-path cell is used on the reference side, its holder (P/N 204-28720) is required.

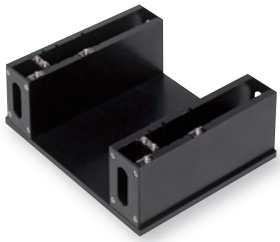
Reference-Side Rectangular Long-Path Absorption Cell Holder (P/N 204-28720)

If using a 4-cell-type universal rectangular cell holder, use this as a reference-side cell holder if necessary.



Long-Path Rectangular Cell Holder (P/N 204-23118-01)

Holds two rectangular cells with an optical path length of 10, 20, 30, 50, 70, or 100 mm.

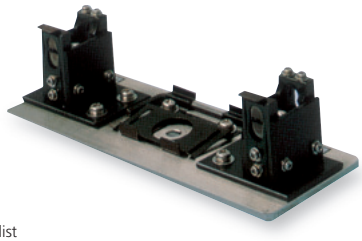


Cylindrical Cell Holder (P/N 204-06216-02)

Holds two cylindrical cells with an optical path length of 10, 20, 50, or 100 mm.

Supermicro Cell Holder (P/N 206-14334)

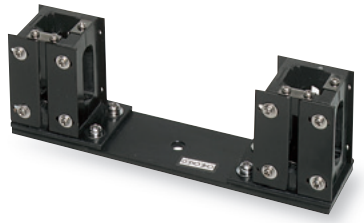
Holds supermicro cells for measurement of extremely small volume samples. The cell height is adjustable, and the required sample volume can be adjusted in the range of 50 to 200 µL, depending on the type of black cell used.



- Applicable cells: (7), (7)', and (8) in the list of cells on page 18. Cells are not included.
- Mask: Choice of W1.5 × H1 mm or W1.5 × H3 mm

Micro Cell Holder with Mask (P/N 204-06896)

Required when using semi-micro cells or micro cells with an optical path width of 4 mm or less. (The mask width can be adjusted.)



Photomultiplier Tube R5108 (for UV-2700 only) (P/N S206-29869-41)

This electron multiplier can widen the measured wavelength range up to the NIR region.

- Measurement wavelength range: 400 to 1150 nm

Low-Pressure Mercury Lamp Unit (P/N 206-28300-58)

This unit is used to install a low-pressure mercury lamp for wavelength accuracy confirmation in the system's light source compartment. It can be interlocked with the validation software provided with the system.

Accessories (Options)

Continuous/Constant-Temperature Measurement

8/16-Series Micro Multi-Cell

Cell Holders

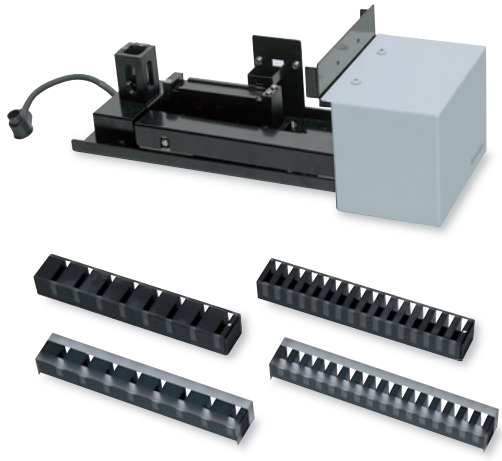
Model	P/N
8/16-Series Micro Multi-Cell Holder MMC-1600	206-23680-58
8/16-Series Constant-Temperature Micro Multi-Cell Holder MMC-1600C	206-23690-91

This cell holder holds one micro multi-cell, either 8 or 16 cells, for micro-volume measurement. Two types of micro multi-cell holders are available: the standard type (MMC-1600) and the constant-temperature water circulation type (MMC-1600C).

Micro Multi-Cells

Model	P/N
8-Series Micro Multi-Cell; optical path length: 10 mm; cell volume: 100 µL	208-92089
16-Series Micro Multi-Cell; optical path length: 10mm; cell volume: 100 µL	208-92088
8-Series Micro Multi-Cell; optical path length: 5 mm; cell volume: 50 µL	208-92086
16-Series Micro Multi-Cell; optical path length: 5mm; cell volume: 50 µL	208-92085

There are two types of micro multi-cells available for both the 8-series and 16-series models: a 50 µL type and a 100 µL type. The cell intervals of the 8-series micro multi-cells are applicable for use with 8 × 12-well microplates and 8-channel pipettes. Microplate samples aspirated into multi-channel pipettes can be injected directly into the cells for measurement.



- Micro-volume samples can be measured. (Minimum sample volume: 50 µL to 100 µL)
- Support for commercial microplates and micro pipettes (with 8-series micro cell).
- Up to 16 samples can be measured at a time (with 16-series micro cell).

For constant-temperature water circulation type

- Circulated water temperature range : 10 to 60 ℃.
- Temperature difference between constant temperature water and cell interior : 3℃ or less.
- Temperature stabilization time : Max. 15 min.
- Connecting joint outer diameter: 6 mm and 9 mm (two levels).

CPS-100 Cell Positioner, Thermoelectrically Temperature Controlled (P/N 206-29500-**)

This attachment permits measurement of up to six sample cells under constant-temperature conditions. Combination of this attachment and the Kinetics mode provides measurement of temperature-sensitive enzyme kinetics of one to six samples.

- Number of cells:
  6 on the sample side (temperature-controlled)
  1 on the reference side (temperature not controlled)
- Temperature control range: 16 °C to 60 °C
- Temperature display accuracy: ± 0.5 °C
- Temperature control precision: ± 0.1 °C
- Ambient temperature: 15 °C to 35 °C

(Note)
Square cells (P/N 200-34442) are not included as standard. Please purchase separately.
A USB adapter CPS (P/N 206-25234-91) is required.

TCC-100 Thermoelectrically Temperature-Controlled Cell Holder (P/N 206-29510-**)

Uses Peltier effect for controlling the temperatures of the sample and reference sample. No thermostatic bath or cooling water is required, so the operation is quite simple and easy.

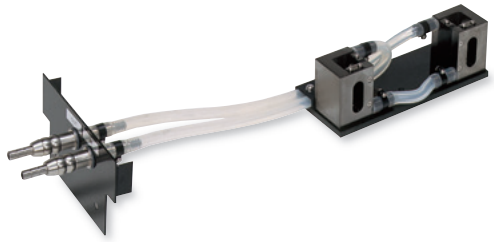
- Number of cells: One each on the sample and reference sides (temperature-controlled)
- Temperature control range: 7 °C to 60 °C
- Temperature display accuracy: ± 0.5 °C
- Temperature control precision: ± 0.1 °C

(Note)
Square cells (P/N 200-34442) are not included as standard. Please purchase separately.

Constant-Temperature Cell Holder (P/N 202-30858-04)

Maintains a sample cell and reference cell at a desired, uniform temperature, by circulating constant-temperature water.

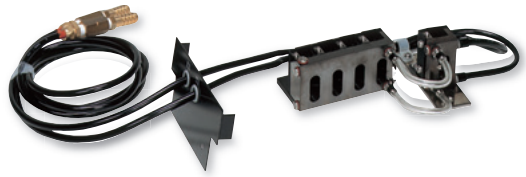
- Temperature range: 5 °C to 90 °C
  (depends on the performance of the constant-temperature water circulator)
- Cell holder: Accepts a pair of 10-mm square cells
- Connecting joint outer diameter: 6 mm and 9 mm (two levels)



Constant-Temperature Four-Cell Holder (P/N 204-27206-02)

Maintains four sample cells and a reference cell at a desired, uniform temperature, by circulating constant-temperature water.

- Temperature range: 5 °C to 90 °C
  (depends on the performance of the constant-temperature water circulator)
- Cell holder: Accepts four 10-mm square cells plus a reference cell
- Connecting Joint outer diameter: 9.5 mm



(Note)
The Four-Cell Sample Compartment Unit (P/N 206-23670-91) is necessary.

S-1700 Thermoelectric Single-Cell Holder (P/N 206-23900-**)

This cell holder permits setting of a temperature program to increase and decrease the sample cell temperature.

- The thermoelectric system allows prompt control of sample temperature between 0 °C and 110 °C.
- Temperature increase/decrease speed can be changed using 12 settings, which means the holder can be used in analysis of melting curves for nucleic acids, etc. that occur during quick as well as slow heating (or cooling).
- A stirrer is also provided to ensure uniform temperature distribution throughout the cell.
- Cooling water circulation is required for Peltier element cooling. Although tap water can be used, it is recommended that a commercially available constant-temperature water circulator be used, as the following conditions must be fulfilled to extract maximum performance from the S-1700.
  - Cooling water specification: 20 ± 2 °C
  - Water flow: 4.8 L/min or more
- Temperature is not controlled at the reference side.
- Cells are not included. Please use 10-mm square tight-sealing cells (from Hellma).
- Temperature accuracy in cell (when room temperature is 25 °C):
  Within ± 0.25 °C (0 °C to 25 °C)
  Within ± 1 % of set value (25 °C to 75 °C)
  Within ± 2 % of set value (75 °C to 110 °C)

Type	Optical Path Length	Minimum Sample Volume Required
110-QS-10	10 mm	3.5 mL
115B-QS-10	10 mm	400 µL

(Note1) Please purchase the constant-water circulator which fulfills specifications below.
Temperature range: 20 ± 2°C, Flow rate: 4.8 L/min or more
Inner diameter of the connecting pipe: 4 mm

(Note2) To prevent the condensation on the surface of cell when covering measurement point under 10℃, Nitrogen gas (or dry air) supply to purge connector is required.
The equipments below are necessary for purging.
Flow rate: Approx. 3 L/min (less than 5L/min)
Inner diameter of the connecting pipe: 4 mm

TMSPC-8 Tm Analysis System (P/N 206-24350-**)

This system obtains a temperature-versus-absorbance curve data, and the Tm Analysis Software analyzes the Tm (melting temperature) of nucleic acids such as DNA and RNA. The system consists of an 8 Series Micro Multi-Cell Holder, Tm Analysis Software, and Temperature Controller. 8 Series Micro Cells, Silicone Cap, and Constant-Temperature Water Circulator for protecting Peltier device are not included. Please purchase separately.

Description	P/N
8 Series Micro Cell Optical Path 10 mm, Sample Volume 100 µL	208-92097-11
8 Series Micro Cell Optical Path 1 mm, Sample Volume 35 µL	208-92140
Silicone Cap for Micro Cell (24 pcs)	206-57299-91

- Temperature control range: 0 °C to 110 °C
- Tm Calculation mode: Average Method, Differential Method

(Note1) Please purchase the constant-water circulator which fulfills specifications below.
Temperature range: 20 ± 2°C, Flow rate: 4.8 L/min or more
Inner diameter of the connecting pipe: 4 mm

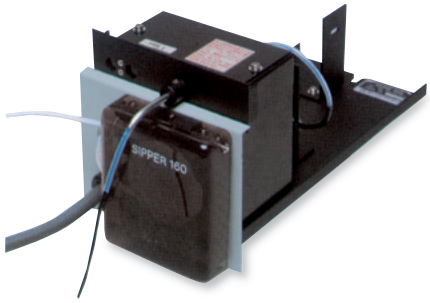
(Note2) To prevent the condensation on the surface of cell when covering measurement point under 10℃, Nitrogen gas (or dry air) supply to purge connector is required.
The equipments below are necessary for purging.
Flow rate: Approx. 3 L/min (less than 5L/min)
Inner diameter of the connecting pipe: 4 mm

Accessories (Options)

Flow/Automatic Measurement

Sipper Unit

Model	P/N	Standard Sample Volume
Sipper Unit 160L (Standard Type)	206-23790-51	2.0 mL
Sipper Unit 160T (Triple-Pass Type)	206-23790-52	1.5 mL
Sipper Unit 160C (Constant-Temperature Type)	206-23790-53	2.5 mL
Sipper Unit 160U (Supermicro Type)	206-23790-54	0.5 mL



Four types of sipper units with different flow cell types are available.
The stepping motor-driven peristaltic pump ensures reliable and smooth aspiration of sample solution.
(Direct driving is possible from the UV-2600/2700, so no interface is required.)

(Note)
The use of a Solenoid Valve (fluoropolymer) (P/N 204-06599-01) and the SWA-2 Sample Waste Unit (P/N 206-23820-58) are recommended when strong acids, strong alkalis, or organic solvents are to be measured.

Syringe Sipper

Model	P/N
Syringe Sipper N (normal temperature type)	206-23890-51
Syringe Sipper CN (constant temperature, water circulator type)	206-23890-52

The sipper unit employs a syringe-pump system. The liquid-contact surfaces are composed of fluoropolymer, glass, and quartz, imparting excellent chemical resistance and ease of maintenance, and allowing measurement of almost any sample type. Furthermore, the extremely high repeatability of sipping volume (repeat precision: ± 0.03 mL) makes it ideal when performance validation is required.

(Note)
Flow cell available separately. Choose from the recommended flow cells listed below in accordance with the application.

Recommended Flow Cells				
Cell Type	P/N	Optical Path Length	Dimensions of Aperture	Standard Required Sample Volume
Square (ultra-micro)	208-92114	10 mm	ø2 mm	0.9 mL
Square (micro)	208-92113	10 mm	ø3 mm	1.0 mL
Square (semi-micro)	208-92005	10 mm	H11 × W3.5 mm	5.0 mL

- The flow cell can be changed independently for excellent ease of maintenance.
- Circulated-water temperature range: ambient to 60 °C (CN type)
- Internal diameter of circulated-water connecting tubing : 4 mm or 12 to 16 mm. (CN type)

(Note)
If a square flow cell (micro or supermicro) is used, attaching mask R (P/N 206-88679) to the reference cell holder is recommended to balance the light intensity.

ASC-5 Auto Sample Changer (P/N 206-23810-**)

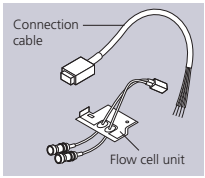
Combine with a sipper unit or syringe sipper to build an automated multisample spectrophotometry system.

- The aspirating nozzle is programmed to move in the X, Y, and Z (vertical) directions.
- Up to eight sets of operational parameters, including the sizes of racks and the numbers of test tubes, may be stored in the battery backup protected files.
- Up to 100 test tubes may be set together on the rack.

(Note)
A commercially available test tube stand, with a footprint smaller than 220 × 220 mm, is applicable.
A USB adapter ASC (P/N 206-25235-91) is required.
It is not available in Europe.

Sample Pretreatment Automation Connection Kit (P/N 206-80880-02)

The kit enables connection with the Gilson GX-271 Liquid Handler. The liquid handler can automatically perform a variety of sample pretreatments including dispensing, dilution, and the addition of reagents. This kit enables the liquid handler and spectrophotometer to be interlocked for measurements.



- The connection kit consists of a flow cell unit and connection cable. The liquid handler is not included.

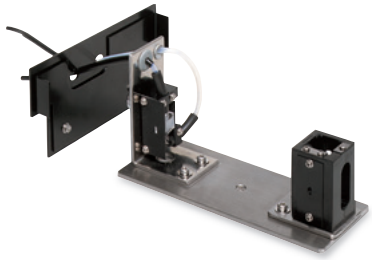
GX-271 Liquid Handler

Micro Flow Cell

Model	P/N	Optical Path Length	Volume
10-mm Micro Flow Cell with Holder	204-06222	10 mL	0.3 mL
5-mm Micro Flow Cell with Holder	204-06222-41	5 mL	0.15 mL

Used for the continuous analysis of samples such as the liquids produced by column chromatography.

- Inner diameter of tube: 1 or 2 mm

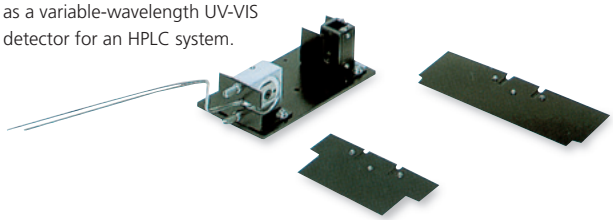


Front Panel with Holes (P/N 204-27588-03)

Allows the tubes of a flow cell, for example, to be connected through the front panel of the instrument.

Flow Cell for HPLC (P/N 206-12852-41)

With this flow cell attached, the spectrophotometer can be used as a variable-wavelength UV-VIS detector for an HPLC system.

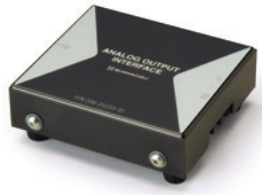


- Inner diameter: 1 mm; Optical path length: 10 mm; Inner volume: 8 µL
- Flow cell on the sample side and cell holder with mask on the reference side
- SUS tube: Outer diameter: 1.6 mm; Inner diameter: 0.3 mm

Analog Output Interface (P/N 206-25233-91)

Allows analog output for monitoring a liquid chromatograph, etc. and can be connected to an integrator.

- Analog output full scale:
  100 mV / 2 Abs or 100 mV / 100 %T



Accessories (Options)

Film Sample Measurement/Reflectance (Specular/Diffuse) Measurement/Transmission Measurement of Suspension Sample

Film Holder (P/N 204-58909)

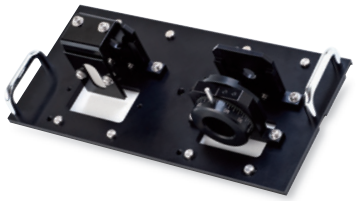
This holds films, filters, and other thin samples firmly for measurement.

- Sample size
  Minimum: W16 × H32 mm
  Maximum: W80 × H40 × T20 mm

Rotating Film Holder (P/N 206-28500-41)

This film holder can rotate samples in a plane centered on the optical axis. Polarizers Type I, II, and III can be attached. The Large Polarizer Set cannot be used.

- Sample size:
  33 mm × 30 mm × 2 mm thick



Glass/Film Holder for Standard Sample Compartment (207-21573-41)

This holder is for flat plate transmission measurements for glass or film. It is attached to a standard sample compartment for use. A polarizer sold separately can be attached before the sample.

- Applicable sample size:
  Glass Sample holder unit: 15 mm × 15 mm square, thickness: 1 mm max.
  Film Sample holder unit: 16 mm (W) × 32 mm (H) to 80 mm (W) × 40 mm (H), thickness: 20 mm max.

Cell Type Film Sample Holder (207-21637-41)

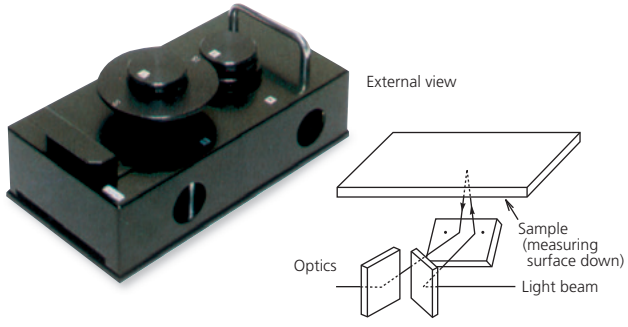
This holder is used to place film samples in a standard 10 mm square cell holder.

- Applicable sample size:
  9 × 9 mm square to 10 × 10 mm square
  Thickness: 0.1 mm max.

Specular Reflectance Measurement Attachment (5° Incident Angle) (P/N 206-14046-58)

The technique of specular reflectance measurement is often applied to the evaluation of semiconductors, optical materials, multiple layers, etc. relative to a reference reflecting surface. The 5° incident angle minimizes the influence of polarized light. Thus, no polarizer is required for measurement, making the operation quite simple.

- Samples as large as W100 × D160 × T15 mm can be readily measured.
  The minimum size is 7 mm in diameter.
- Sample placement is easy - just set it on a holder with the measuring surface down.



Measurement of suspension samples is difficult due to the scattering of reflected light by fine particles in the solution. Integrating spheres are used in this type of analysis. The glass method involves the placement of a scattering board behind the sample, resulting in the equalization of scattering coefficients of the reference side and sample side. As shown in Figure 1, the integrating sphere method involves a barium sulfate-coated sphere that draws the scattered light, allowing all of the light to reach the detector. Since light cannot penetrate opaque samples, it is reflected on the surface of the samples. Figure 2 shows one case in which incoming light is reflected symmetrically with respect to the normal line (forward reaction), and another case in which the incoming light is scattered in different directions. The former is referred to as specular reflection and the latter is referred to as diffuse reflection.

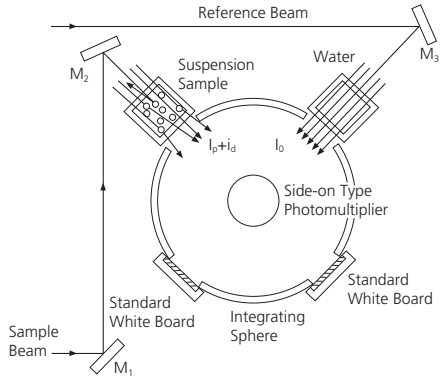


Figure 1. Semi-Transparent Sample Measurement Using the Integrating Sphere Method

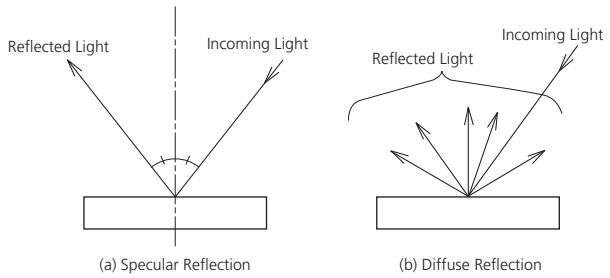
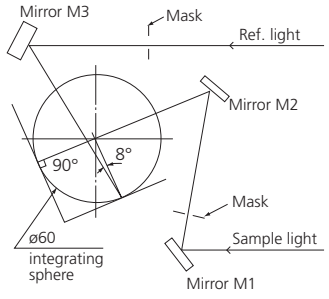


Figure 2. Specular Reflection and Diffuse Reflection

ISR-2600 Integrating Sphere Attachment (P/N 206-28400-58)

ISR-2600Plus Integrating Sphere Attachment (for UV-2600 only) (P/N 206-28410-58)

By combining the 0°/8° incidence angle integrating sphere with the S/R exchange function of the spectrophotometer, diffuse and specular reflectance measurements are possible without using any special attachments.
The size of the light beam for reflectance measurements can be changed, which enables reflectance measurement of micro samples (minimum light beam dimensions about 2 × 3 mm). Light beams for transmittance measurements can be concentrated to dimensions of 3 × 3 mm.
The ISR-2600Plus is an integrating sphere equipped with two detectors: a photomultiplier tube and an InGaAs detector.



ISR-2600/2600Plus specifications

- Inner diameter of integrating sphere: 60 mm
- Maximum size of reflectance sample: W95 × H135 × T20 mm (0° incidence side)
  W70 × H70 × T12 mm (8° incidence side)

ISR-2600 specifications

- Measurement wavelength range: 220 to 850 nm
- Noise level: 0.1 %T RMS 500 nm (UV-2600)
  0.3 %T RMS 500 nm (UV-2700)
- 100 % flatness: ± 0.5 %T (UV-2600)
  ± 1.5 %T (UV-2700)
- Near-infrared range stray light:
  0.4 %T (1400 nm, H_2O, 5mm slit, typical value)

ISR-2600Plus specifications

- Measurement wavelength range: 220 to 1400 nm
- Noise level: 0.1 %T RMS 500 nm
  0.3 %T RMS 900 nm
- 100 % flatness: ± 0.5 %T (220 to 1300 nm)

Powdered Sample Holder (P/N 206-89065-41)

This powdered sample holder is for attachment to an integrating sphere. It can be attached to all integrating spheres.

- Minimum capacity is 0.16 mL.
- 3 holders are included.

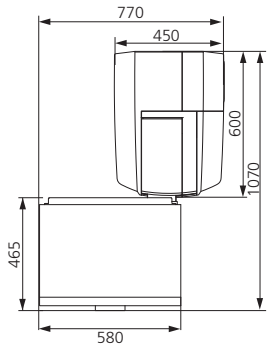
Accessories (Options)

Variable Angle Reflectance/Transmittance Measurement
Absolute Reflectance Measurement/Micro Measurement/Lens Measurement

MPC-2600A Multipurpose Sample Compartment (P/N 207-23520-41)

The MPC-2600A enables both reflectance and transmittance measurement of samples having a wide variety of shapes. An integrating sphere is built-in to permit accurate measurement of solid samples. The sample space around the integrating sphere is ample enough to allow measurement of very large samples.

- Measurement wavelength range: 220 to 1400 nm
- Maximum sample size:
  Transmittance: 305 mm dia. × 50 mm thick or 204 mm dia. × 300 mm thick
  Reflectance: 305 mm dia. × 50 mm thick
- With independent S/R beam switching, 0°/8° incidence angle reflectance measurement is possible without tilting the sample.
- With the integrating sphere shift function, the range of applications is expanded.
- The sample position can be adjusted vertically and laterally when using V stage. (V stage is sold separately)
- Noise level: 0.1 %T RMS 500 nm (UV-2600)
  0.3 %T RMS 500 nm (UV-2700)
- 100 % flatness: 350 to 850 nm
  ± 0.5 %T (UV-2600)
  ± 1.5 %T (UV-2700)



For details of variable angle measurement units and micro measurement units, see C101-E151 brochure.

Variable Angle Measurement Unit for MPC-2600A (P/N 207-23490-41)

This allows transmittance/reflectance measurements with the angle of incidence selectable. It is useful in the evaluation of anti-reflection coatings on solar cells, display panels and front windshield for vehicles, used in such fields as optics and semiconductors.

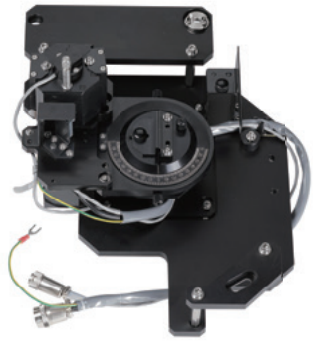
■ Specifications

- Wavelength range: 250 to 1400 nm
- Absolute reflection incident angle: Continuously variable from 5° to 70°
- Absolute reflection light receiving angle: Continuously variable from 10° to 140°
- Transmitted light receiving angle: Continuously variable from 0° to 90°
- Applicable sample : 20 mm x 20 mm square to 70 mm x 70 mm square,
  2 mm to 15 mm thickness

(Note)

MPC-2600A Multipurpose Large-Sample Compartments (P/N 207-23520-41) is necessary for using this unit. A reforming kit shown below must be purchased separately to attach this variable angle measurement unit to the MPC-2600:MPC-2600A reforming kit (207-24368-41).

A polarizer is required for measurements in which the incident angle exceeds 10°. See Page 27 for details.



Variable Angle Measurement Unit

Absolute Reflectance Attachment

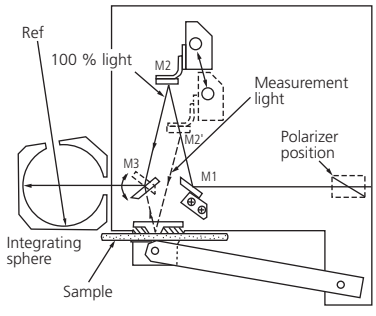
Model	P/N
ASR-3105 Absolute Reflectance Attachment, 5°	206-16817-58
ASR-3112 Absolute Reflectance Attachment, 12°	206-16100-58
ASR-3130 Absolute Reflectance Attachment, 30°	206-15001-58
ASR-3145 Absolute Reflectance Attachment, 45°	206-15002-58

These accessories are intended for use with the MPC-2600A Sample Compartment, and require the BIS-3100 Sample Base Plate-Integrating Sphere Set (P/N 206-17059-58). At larger angles of incidence (12°, 30°, 45°), a polarizer is also required.

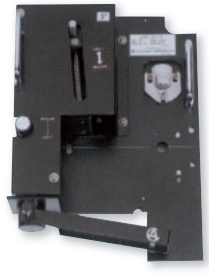
- Measurement wavelength range: 300 to 800 nm
- Accuracy: with respect to 90 % reflectance samples
  Incidence angle 5°: ± 1.5 %
  Incidence angle 12°: ± 1.0 %
  Incidence angle 30°, 45°: ± 2.5 %
- 100 % level sample setting: The sample measurement optical path can be switched using the single-touch V-N method.
- Approximate sample size: 25 to 200 mm dia., or 20 to 150 mm square, up to 30 mm thick

(Note)

The BIS-3100 Sample Base Plate-Integrating Sphere Set (P/N 206-17059-58) is required for mounting these absolute specular reflectance attachments.



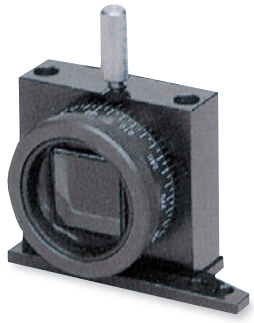
Construction of Absolute Reflectance Attachment



Large Polarizer Set, Polarizer Type I, II, III

This accessory is for performing measurements when an absolute reflectance attachment is used, with no impact from polarization properties.
The Polarizer Adapter Set (P/N 206-15693) is simultaneously required for Polarizers Type I, II, and III.

Description	P/N	Effective Diameter	Wavelength Range
LRLR-1 Large Polarizer Set	206-15694-40	20 mm	250 to 2500 nm
PLR-1 Polarizer Type I	206-13236-41	18 mm	400 to 800 nm
PLR-2 Polarizer Type II	206-13236-42	17 mm	260 to 700 nm
PLR-3 Polarizer Type III	206-13163-40	10 mm	260 to 2500 nm



Micro Beam Lens Unit (P/N 206-22051-41)

This allows measurements in the micro region by focusing the beam delivered to the sample.
It is useful in the evaluation of micro components, such as smartphone camera lens and windows application, used in the electrical and electronics fields.

- Light beam size: 1.3 mm dia., 2.2 mm dia.

(Note)
MPC-2600A Multipurpose Large-Sample Compartments (P/N 207-23520-41) and BIS-603 Sample Base Plate Integrating Sphere Set (P/N 206-17059) are required separately. In addition, use Micro Sample Holder (P/N 206-28055-41) or D25 mm Cylindrical Sample Holder (P/N 20723559-41) together.

Micro Beam Lens Unit

Micro Sample Holder (P/N 206-28055-41)

This holder is for holding micro samples. Samples are held by compressing them vertically.

- Applicable sample size:
  Round: 5 mm to 10 mm dia. Thickness: 0.5mm to 2mm
  Square: 5 mm x 5 mm to 10 mm x 10 mm Thickness: 0.5mm to 2mm

(Note)
When using Micro Sample Holder, unit equipped with integrating sphere is required. This holder is for transmittance measurement.
It is recommended to use Micro Beam Lens Unit (P/N 206-22051-41) and associated accessories for micro measurement.

Micro Sample Holder

Cylindrical Sample Holders (D25/D50/D110) (P/N 20723559-41/42/43)

The holder is for holding cylindrical samples of 5 to 25 mm dia.

- Applicable sample size:
  D25 mm Thickness of 5 to 25 dia. Thickness: 5mm
  D50 mm 30 to 50 dia. Thickness: 5mm
  D110 mm 40 to 110 dia. Thickness: 9mm

(Note)
When using this holder, MPC-2600A Multipurpose Large-Sample Compartments (P/N 207-23520-41) is required.
When using D25 mm, use Micro Beam Lens Unit (P/N 206-22051-41) and associated accessories together.

Cylindrical Sample Holder

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