■ Installation requirements

Item	UV-Visible/NIR Spectrophotometer UH5700
Data processing section	OS: Microsoft Windows 10 Pro (64 bit) * Display: (Desktop model) 21.5 inches wide or larger, resolution 1,920 x 1,080 pixels (full HD) (Notebook model) 15.6 inches wide or larger, resolution 1,920 x 1,080 pixels (full HD)
Dimensions (Main unit)	630(w)×695(D)×294(H) mm
Weight of main unit	46 kg
Power source	AC 100, 115, 220, 230, 240 V, 50/60 Hz 400 VA (not including personal computer or printer)
Power consumption	200 W or less
Operating temperature	15 to 35 °C
Operating humidity	25 to 80 % (No condensation, 70 % or less at temperatures of 30 °C or higher)

*"WINDOWS" is registered trademarks of the Microsoft Corporation in the US and other countries.

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*This logo is the trademark of Hitachi High-Technologies Corporation in Japan and other countries.

CAUTION: For correct operation, follow the instruction manual when using the instrument.
Specifications in this catalog are subject to change with or without notice, as Hitachi High-Tech Science Corporation continues to develop the latest technologies and products for its customers.
NOTICE: The system is For Research Use Only, and is not intended for any animal or human therapeutic or diagnostic use.
These data are an example of measurement; the individual values cannot be guaranteed.

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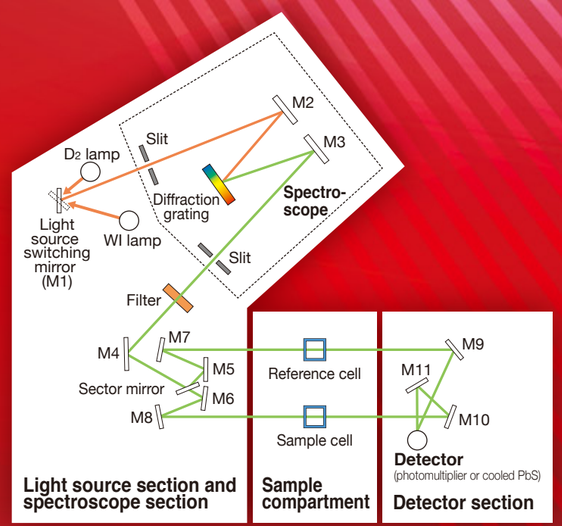
UV-Visible/NIR Spectrophotometer
UH5700

HITACHI
Inspire the Next

Science for
a better tomorrow

Opening the way to the future, the UH5700, the spectroscopy specialist, handles the ultraviolet, visible, and near-infrared regions and strongly supports you.

Scans over a broad wavelength range and is packaged in a table-top size.



Schematic view of the UH5700 optical system

Features

Continuously Variable Slit

Through the use of a continuously variable slit, low-noise measurements can be made over a broad wavelength region including the ultraviolet, visible, and near infrared (190 to 3,300 nm)

Low Stray Light, High Photometric Range

Achieves best-in-class levels of low stray light and high photometric range through use of a Czerny-Turner mounted single-monochromator bright spectrometer and a newly-developed grating*1

Supports high-speed scanning

Employs a gear-drive system to realize high-speed scanning of the visible, ultraviolet, and near-infrared regions

New control and data-processing software

A more comfortable operating environment using UV Solutions Plus

Many accessories

A line-up of accessories to support a wide range of measurement objectives

*1 Hitachi High-Tech Science survey of models marketed within Japan (single monochromator instruments supporting near-infrared wavelength range) as of April 2019

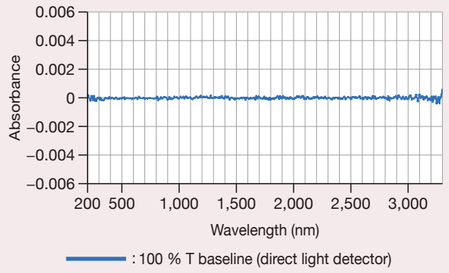
Hardware

Handling the ultraviolet, visible, and near-infrared regions (190 to 3,300 nm), the UH5700 achieves both high measurement precision and high throughput

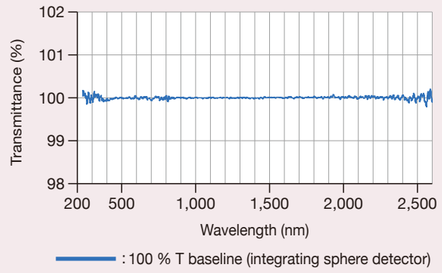
Use of a continuously variable slit

The UH5700 employs a continuously variable slit in the near-infrared region, in which the slit automatically widens when measuring low quantities of light and narrows when measuring large quantities of light, and thereby achieves low-noise measurements across a broad range of measurement wavelengths from 190 to 3,300 nm.

Direct light detector

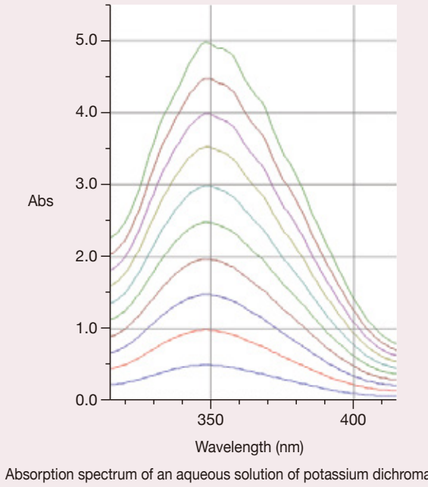


Integrating sphere detector

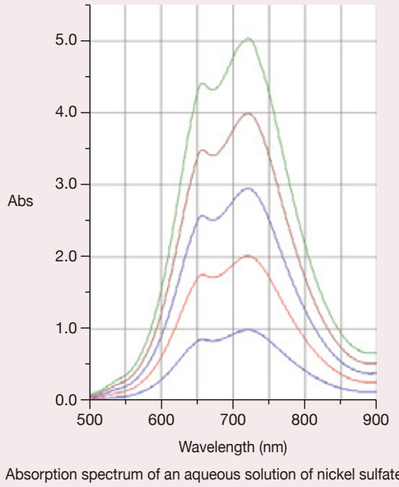


Low stray light

The UH5700 achieves best-in-class levels of low stray light and high photometric range through use of a Czerny-Turner mounted single-monochromator bright spectrometer and a newly developed grating using photolithography technology.*2



Absorption spectrum of an aqueous solution of potassium dichromate



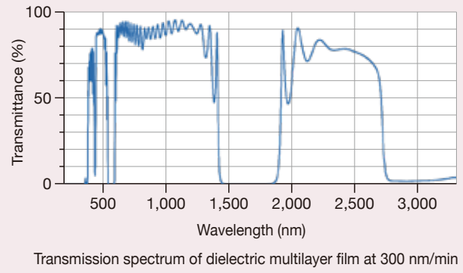
Absorption spectrum of an aqueous solution of nickel sulfate

*2 Hitachi High-Tech Science survey of models marketed within Japan (single monochromator instruments supporting near-infrared wavelength range) as of April 2019

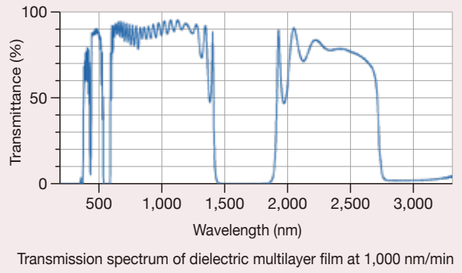
Measurement throughput improvements

By employing a gear-drive system for the wavelength drive, high scanning speeds compared to conventional instruments are achieved of approximately 0.3 to 5,000 nm/min in the ultraviolet-visible region.*3 When measuring at a 1 nm interval, a measurement made at 1,000 nm/min in the 190 to 3,300 range can be completed in approximately 4 minutes.

Comparison of 1 nm interval spectra at scanning speeds of 300 and 1,000 nm/min



Transmission spectrum of dielectric multilayer film at 300 nm/min



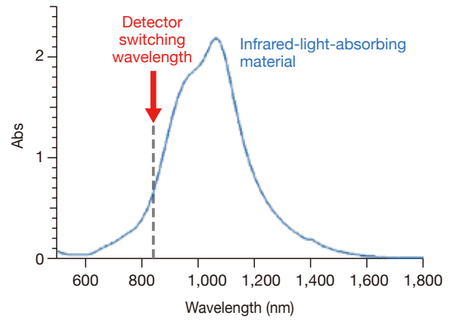
Transmission spectrum of dielectric multilayer film at 1,000 nm/min

*3 U-3900 : 1.5 to 2,400 nm/min, U-2900 : 10 to 3,600 nm/min.

Control of detector switching level difference

Generally, UV-visible/near-infrared spectrophotometers use different detectors in the UV-visible region and the near-infrared region. Because different detectors are used, a difference in photometric values may arise in switching between detectors. Through know-how developed from the fundamentals, signal processing technology, and other techniques, the UH5700 holds the level difference when switching detectors to a minimum.

Example of a measurement near the detector switching wavelength
(absorption spectrum of an infrared light absorbing material)



Common utilization of accessories

The sample compartment shares a common design with the U-2900/U-3900 spectrophotometers, so you can use the accessories you already have.*4 We offer an extensive line-up of accessory types tailored to measurement objectives.

*4 Except for certain accessories (please check with your sales representative for details)

Software

Simple operation flow and abundant data processing features make analysis pleasant

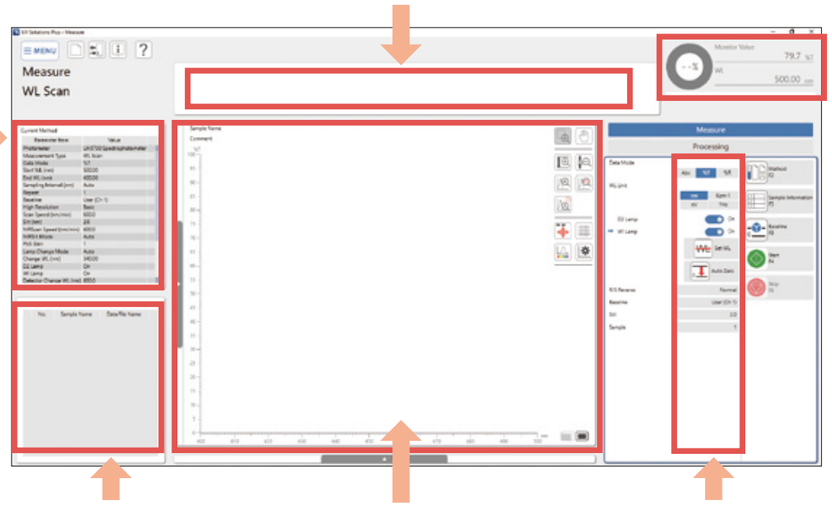
Use of new control and data processing software UV Solutions Plus

Enhancements have been added compared to the popular UV Solutions including a tabular form display feature for data lists and data processing results, a report layout feature, a performance confirmation feature, and more.

■ Measurement conditions display
Displays measurement parameters during a measurement.

Displays measurement guidance.

■ Measurement progress display
Displays measurement progress as a pie chart.

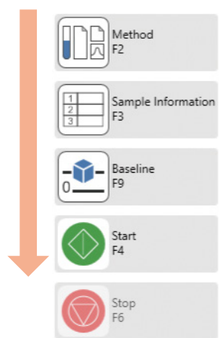


■ Sample information
Displays the sample name.

■ Measurement data
Displays the spectrum during a measurement.

■ Measurement operation display
The display mode can be changed during a measurement.

Operation flow
The measurement operation buttons are located on the right side. A measurement can be made using basic operations in four steps.



❶ Set Analysis Conditions
Press Analysis Conditions and set the conditions.

❷ Set Sample Information
Detailed conditions related to the measurement sample, the storage location for data, and other parameters can be set.

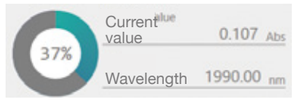
❸ Baseline
Perform baseline correction.

❹ Measurement Start
Start the measurement.

Many added features that follow in the footsteps of existing operability

- Change the wavelength unit of a monitored value during measurement
- Measurement progress display
- Photometric value unit conversion (Abs, %T)
- Direct display of the concentration calculated from coefficients
- Batch data processing of multiple files, and more

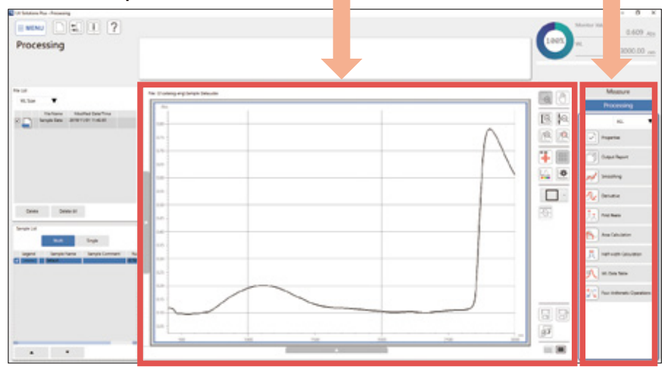
Measurement progress display



Data processing screen example

Enables switching of the display and scale in accordance with the application

Extensive data processing menu



List display feature for data processing results

Specific wavelength data, area calculation data, half-value width calculation data and other data across multiple samples can be displayed in tabular form. Comparing data between samples can be done easily. In addition, you can return to raw data after storing processed data.

Reporting function

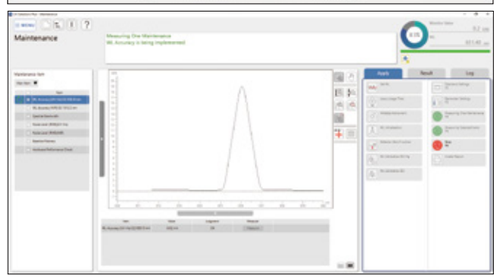
More effective for preparing reports.

You can freely lay out printable items such as analysis conditions, data processing results, spectra, etc. with the report layout feature, which did not exist in the UV Solutions software in the past. You can also print designated image data (jpg, png, and bmp).

Standard installation of performance confirmation feature

This feature can check for proper function and performance on a daily basis.

Performance confirmation feature items: wavelength accuracy, wavelength setting repeatability, noise level (RMS), baseline flatness, baseline stability, spectral band width, photometric accuracy, stray light, group editing of performance confirmation items, graphical display of performance confirmation results history.

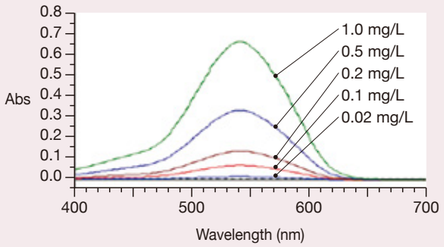


Applications

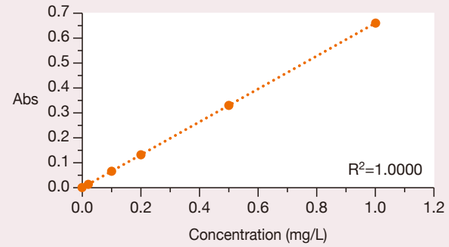
Supports problem solving for a variety of applications

Measurement of hexavalent chromium (diphenylcarbazide absorptiometry)

We present an example of analysis by diphenylcarbazide absorptiometry of hexavalent chromium, which is subject to regulation by the RoHS directive. Hexavalent chromium was measured using “Reagent Set for Water Analyzer No. 31 Chromium (Hexavalent)” made by Kyoritsu Chemical-Check Lab., Corp. From the absorption spectrum measurement results, the presence of an absorption peak at a wavelength of 540 nm was confirmed. Good linearity was obtained for the calibration curve at the 540 nm absorption peak with R^2 = 1.0000.



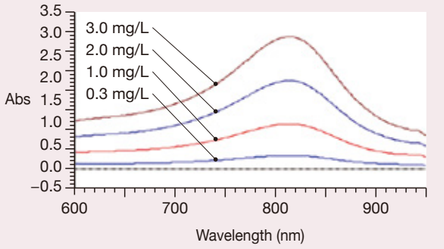
Absorption spectrum of hexavalent chromium



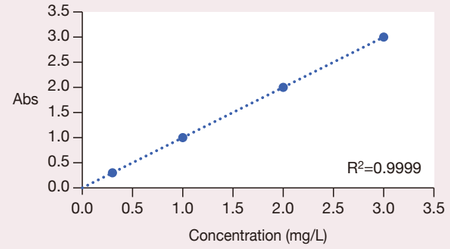
Calibration curve for hexavalent chromium

Measurement of silica (molybdenum yellow absorptiometry)

The measurement for silica by molybdenum yellow absorptiometry is prescribed in JIS K0101 Testing Methods for Industrial Water. Silica was measured using “Reagent Set for Water Analyzer Silica” manufactured by Kyoritsu Chemical-Check Lab., Corp. From the absorption spectrum measurement results, the presence of an absorption peak at a wavelength of 815 nm was confirmed. Good linearity was obtained for the calibration curve at the 815 nm absorption peak with R^2 = 0.9999.



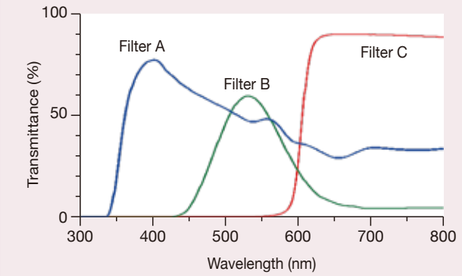
Absorption spectrum of silica



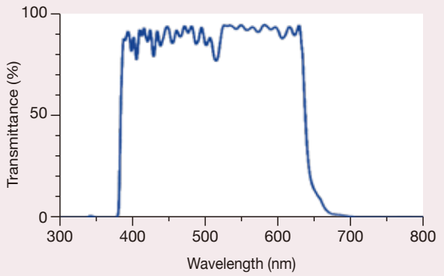
Calibration curve for silica

Measurement of filters

Transmission filters have the role of transmitting light of the target wavelength region. It was confirmed that filters A, B, and C had good transmission characteristics in the red, green, and blue regions, respectively, and that filter D had good transmission characteristics in the visible region.



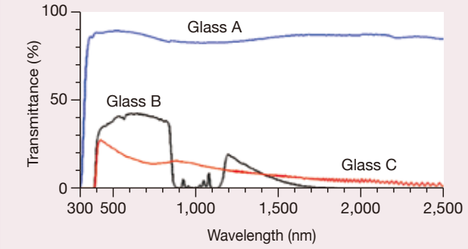
Transmission spectra of filters A, B, and C



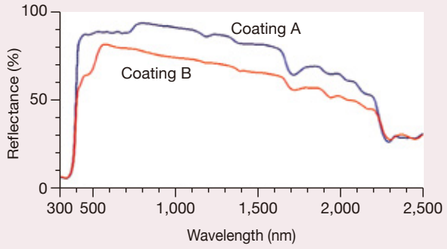
Transmission spectrum of filter D

Measurement of window glass and coatings

Near-infrared light from the sun is a source of heat that can pass through glass windows and cause the temperature of a room to rise. Because of this, functional glass has been employed in recent years that cuts near-infrared light. In addition, functional coatings have been used on the outer walls of buildings to reflect near-infrared light. The optical characteristics of functional glass and functional coatings were measured.



Transmission spectra of three types of glass



Reflection spectra of two types of coatings

Accessories

A line-up of accessories to support a wide range of measurement objectives

The sample compartment shares a common design with the U-2900/U-3900, so you can use the accessories you already have.*6

*6 Except for certain accessories (please check with your sales representative for details)

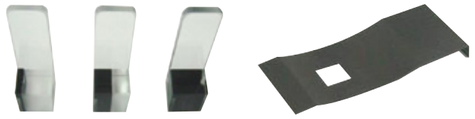
Micro cell option

Micro cells are used in combination with a Mask for micro cells (200-1537). These cells are suitable for small-volume samples on the order of 340 to 600 µL.

Product name	P/N	Capacity (µL)	Optical path length
10 mm micro quartz cell	124-0357	340～600 µL	10 mm
Black 10 mm micro quartz cell	200-0551		
Mask for micro cell	200-1537	—	—

Ultra-micro volume sample measurement option

Trace sample cells are used in combination with a Mask for trace sample cells (3J1-0115) (2 included). These cells are suitable for ultra-micro volume samples on the order of 1.5 to 90 µL.



Product name	P/N	Capacity (µL)	Optical path length
1.5 µL trace sample cell	3J2-0120	1.5～4.0 µL	1 mm
12 µL trace sample cell	3J2-0121	12～40 µL	5 mm
50 µL trace sample cell	3J2-0122	50～90 µL	10 mm
Mask for trace sample cell	3J1-0116	—	—

Glass filter holder

This holder is used for measuring the transmittance and absorbance of plate solid samples such as glass filters.

P/N 210-2109

Sample thickness	0.5～5 mm
Sample size	12×25 mm～55×100 mm

Film holder

This holder is used for measuring the transmittance and absorbance of film samples.

P/N 210-2112

Film frame	25 mm wide, 30 to 50 mm high
Light beam opening	10 mm wide, 20 mm high

Rectangular long-path cell holder

This holder is used when samples are measured with rectangular long-path cells.
Low-concentration samples can be measured with a high degree of sensitivity.

P/N 210-2107

Optical path length	10、20、30、40、50、100 mm
Outside width	12.75 mm

Reference-side attenuator filter holder

This filter is used when you wish to expand the photometric range of the near-infrared region. To perform a measurement where the photometric range in the near-infrared region is expanded, a NIR Absorptive ND filter NENIR210B made by Thorlabs, Inc. described in the table below is needed in addition to a reference-side dimmer filter holder (2J3-0120).

P/N 2J3-0120

●These items must be purchased separately (customer to purchase and install)

Product name	Manufacturer
NIR Absorptive ND Filter NENIR210B	Thorlabs, Inc.

Polarizer holder

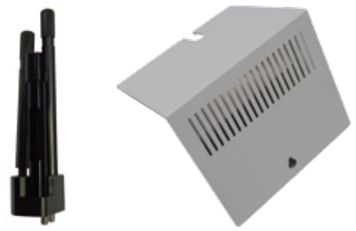
The sample beam is linearly polarized, and the polarization properties are measured. This holder can be used in combination with an analyzer.

P/N 210-2130

Wavelength range	400～750 nm
Sample thickness	0.5～5 mm
Sample size	Smallest: 12 x 25 / Largest: 55 x 100 mm

Holder set for pen-type low-pressure mercury lamp

This holder set is used when carrying out wavelength calibration or verification of wavelength accuracy using a mercury lamp.



P/N 2J3-0110