



Fluorescence Spectrophotometer
F-7100

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F-7100

Increased sensitivity achieved via optimized optical detection system and ultra-bright Xenon lamp

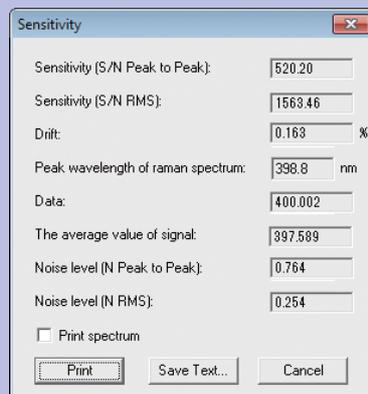


F-7100

F-7100 is the evolution of the robust and reliable F-7000 with the latest optical technology and improved analytical performance.

Enhanced Optical System

- Increased excitation luminance
- Improved emission detection sensitivity
- Optimized signal processing



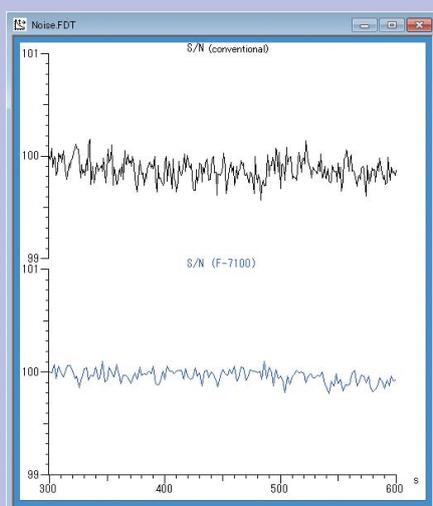
Example of S/N measurement result

The automatic sensitivity (S/N) measurement via Raman scattering of water demonstrates "Best-in-Class" analytical sensitivity.



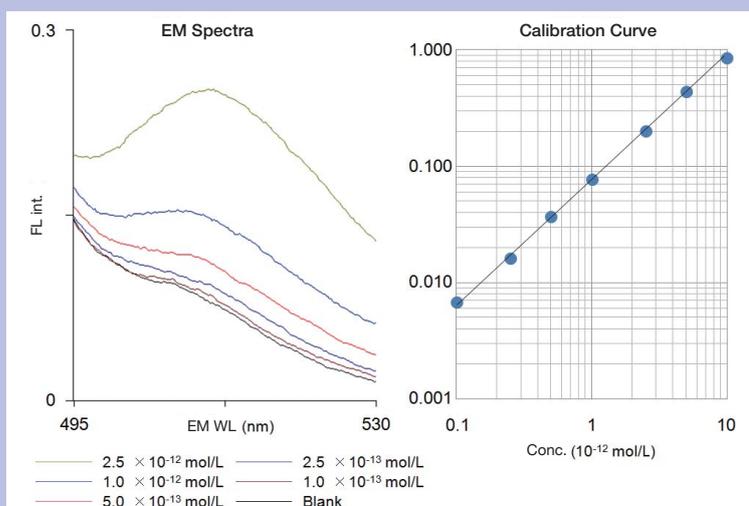
"Best-in-Class" Analytical Signal-to-Noise

Increased sensitivity 1.5x compared to conventional instruments: > 360 of S/N (P-P) and > 1,200 of S/N (RMS)



Comparison of S/N with conventional instruments

The S/N via Raman scattering of water is compared with conventional instruments*1. In addition to the 1.5x higher sensitivity, weak signals are detectable due to very low noise levels. This is also observed in high-speed scanning, which is a widely utilized function of the F-7000 series.



Example of High Sensitivity Analysis (Fluorescein)

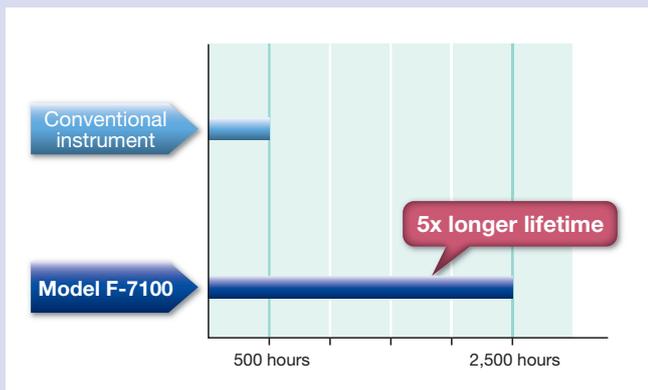
An example of the high sensitivity analysis for fluorescein is shown. The F-7100 detected fluorescence in the order of 1x10⁻¹³ mol/L (sub-picomol) compared with a blank sample (purified water); a useful calibration was obtained in the ultra-trace range.

*1 Conventional instrument: F-7000 Fluorescence Spectrophotometer



Industry leading lamp lifetime

Light source with 5x^{*2} longer lifetime compared to conventional instruments – lifetime of 2,500 hours*³ –



Comparison of lamp lifetimes

With the application of the new Xe lamp and the improved lamp ignition power source, both luminance and the lamp lifetime were increased.

Increased lamp lifetime reduces operating Cost-of-Ownership and instrument service time.

*² Comparison with the service life (recommended replacement interval) of the standard Xe lamp (PN: 650-1500) of F-7000 fluorescence spectrophotometer

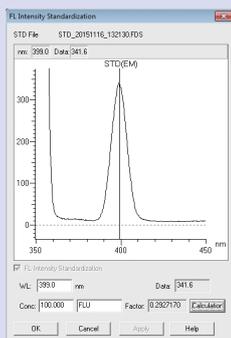
*³ Lifetime is usable limit. Guaranty for 500 operating hours or 6 months, whichever shorter. Troubles due to mishandling are not within guarantes.



New and Improved Functions and Features for Enhanced Operability

Additional software functions – Enhanced convenience for routine analysis –

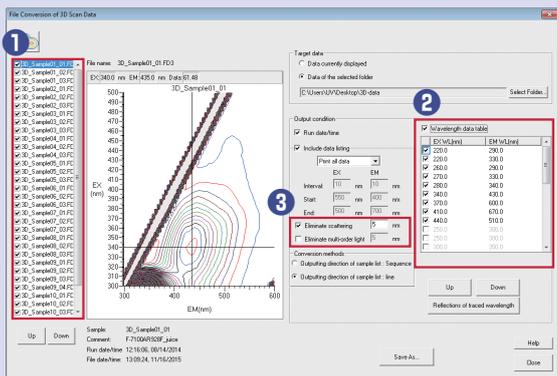
FL intensity standardization to correct for fluorescence intensity variation over time and between instruments.



The variations in the fluorescence intensity over time and between instruments can be corrected. Fluorescence intensity is affected by changes in lamp brightness, room temperature, optical system, etc. The fluorescence intensity of the standard sample is measured, and the sample fluorescence intensity is converted to the fluorescence intensity relative to the standard sample. This standardization is also used for the intensity comparison between different instruments, including the analysis of humic substances in environmental water (conversion to quinine sulfate), the analysis of chlorophyll in water (conversion to fluorescein), and the specified value for reagent purity (conversion to quinine sulfate).

Window for fluorescence intensity standardization

Enhanced report output function to support multivariate analyses such as fluorescence fingerprint analysis



Window of file conversion of 3D scan data

1 File conversion of 3D scan data

Collective output of multiple 3D fluorescence spectral data to Excel. Output Rows and Columns can be transposed, if needed.

2 Applicable to the 3D measurement results of the wavelength data table

By registering the wavelengths to be focused in the wavelength data table, only the required wavelengths are exported to the Excel sheet.

3 Data output of eliminate scattering, Eliminate multi-order scattering

For the multivariate analysis of 3D fluorescence spectral data, the setting to exclude the unnecessary scattered light or the data from the secondary light region is available.

● SPECIFICATIONS

ITEM	DESCRIPTION
Sensitivity (Raman light of water)	Noise: Background S/N 20,000 or above ⁴ Noise: Peak 1,200 or above ⁵
Minimum sample volume	0.6 mL (in use of standard 10 mm rectangular cell)
Photometric principle	Monochromatic light monitoring ratio calculation
Light source	150 W xenon lamp, self-deozone lamp house
Monochromator	Stigmatic concave diffraction grating: 900 lines/mm, F2.2 Braze wavelength: Excitation side 300 nm, emission side 400 nm
Measuring wavelength range (on both EX and EM)	200 to 750 nm, and zero-order light (Expandable up to 900 nm with optional detector)
Bandpass	Excitation side: 1, 2.5, 5, 10, 20 nm Emission side: 1, 2.5, 5, 10, 20 nm
Resolution	1.0 nm (at 546.1 nm)
Wavelength accuracy	±1 nm
Wavelength scan speed	30, 60, 240, 1,200, 2,400, 12,000, 30,000, 60,000 nm/min
Wavelength drive speed	60,000 nm/min
3D measurement time	3 min ⁶
Response	Response from 0 to 98 %: 0.002, 0.004, 0.01, 0.05, 0.1, 0.5, 2, 4 s
Photometric value range	-9999 to 9999
Data processing unit	PC: Windows 7
Printer	Printer compatible with Windows 7
Dimensions/weight	Spectrophotometer: 620 W × 520 D × 300 H mm (excluding protrusions)/41 kg
Working temperature /humidity	15 to 35 °C, 25 to 80 % (condensation not allowed, 70 % or less at 30 °C or higher)
Power consumption (spectrophotometer)	100, 115, 220, 230, 240 V AC, 50/60 Hz, 380 VA
FL Solutions program	Standard software

*4 EX 350 nm, Slit 10 nm, Response 4 s

*5 EX 350 nm, Slit 5 nm, Response 2 s

*6 EX 200 to 750 nm, Sampling interval 10 nm
EM 200 to 750 nm, Sampling interval 10 nm

* "MICROSOFT", "WINDOWS" and "EXCEL" are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.

 labeled model is available

● FUNCTIONS

ITEM	DESCRIPTION
3-dimensional measurement	Contour plotting (fluorescence/phosphorescence), bird's eye view
	Readout of EX/EM spectra from contour
	Peak detection
	Calculation between files (+, -, ×, ÷)
Wavelength scan	Fluorescence/phosphorescence/luminescence spectra
	Synchronous spectra/repetitive measurement/CAT
	Excitation spectrum correction (200 to 600 nm)
	Emission spectrum correction (200 to 600 nm)
	Excitation longer wavelength spectrum correction (500 to 800 nm)
	Emission longer wavelength spectrum correction (500 to 800 nm)
	Note: Sub standard light source (option) is necessary. Tracing, scale conversion, graph axis conversion Smoothing
3-dimensional time scan measurement	Contour plotting (fluorescence/phosphorescence), bird's eye view
	Readout of time scan/EM spectra from contour
	Peak detection
	Calculation between files (+, -, ×, ÷)
Time scan measurement mode	Time scan fluorescence/phosphorescence measurement mode (minimum data interval 1.0 ms)
	Phosphorescence attenuation curve measurement
	Rate calculation
	Tracing, scale conversion, graph axis conversion Smoothing
	Calculation between files (+, -, ×, ÷)
	Differentiation (first to fourth order)
	Area calculation
Photometry mode	Quantitative analysis (fluorescence/phosphorescence/luminescence)
	Two/three-wavelength calculation
	Calibration curve (linear, quadratic, cubic, polygonal), factor enterable
	Peak ratio, peak area, quantization via differentiation
	Interruption, sample blank measurement, data deletion
	Calibration curve data correction, calibration curve tracing
	Cumulative data averaging
	Statistic calculation
	Automatic sensitivity measurement function
	Pre-scan
Others	Data transport and graph copying to Microsoft Excel
	Print preview function
	FL Intensity Standardization
	File conversion of 3D Scan Data

NOTES 1. A PC set is not supplied as standard equipment. It should be prepared separately.



Science Ring

This logo symbolizes Scientific and Analytical instruments of Hitachi High-Tech Group. It is composed with an "S", standing for "Science", our technology core competency, and with a ring that represents close connection we make with our customers. This "Science Ring" shows how we are committed to create new values by strengthening ties between Science and Society.

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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.

● Sales

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● Manufacture

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