EQUIPMENT DESCRIPTION:



The LS-55 Fluorescence Spectrometers: the industry standard for bioscience/pharmaceutical applications:

Academic

Cell biology, cellular toxicity/viability, molecular toxicity, protein folding/unfolding, receptor binding studies, teaching (simple assays, DNS, and protein quantification), research (assay development, cell-based work), apoptosis studies, and phagocytosis/oxidative processes.

Agricultural

Pesticide tracing, resistance assays, chlorophyll determinations, crop protection, genetic modification, and plant genetics

Cell biology

Cytotoxicity, cell studies (viability, quantification, proliferation, adhesion), reporter gene, and apoptosis **Clinical**

Assays (enzyme, substrate, toxicity), porphyrins, steroids, vitamin, and amine studies

Environmental

Pesticide detection, ground water tracing, oil contamination of water, chlorophyll determination of toxic algae, exhaust gas composition, water purity, uranium and aluminum determination, and biomass

Enzymology

Protease assays, inhibition studies, surfactant studies, and kinetic assays

Immunology

Fluorescent enzyme-linked immunosorbent assays, cell proliferation/activation, and tumor necrosis factor **Industrial**

Crack tracing (aerospace), security inks, coding phosphors, brightening/whitening reagents, ultraviolet stabilizers and plasticizers, crude oil fingerprinting, and postage stamp marking

Inorganic

Aluminum, lead, magnesium, manganese, selenium, zinc, and tin

Medical

Enzyme/substrate assays, cellular analysis, including bioluminescence and cell proliferation/activation, immunology assays (tumor necrosis factor and enzyme-linked immunosorbent (ELISA) assay

Molecular biology

DNA and mRNA quantification, gene expression, polymerase chain reaction product quantitation, protein quantitation and folding/unfolding, enzyme activity, porphyrin induction assays, and high throughput drug screening

Pharmaceutical

Vitamins, biogenic amines, drugs, substance abuse, gene expression and discovery, novel drug delivery systems, combinatorial drug discovery, membrane structure studies, toxicity assays, and cell function assays.

The PerkinElmer Fluorescence Spectrometer advantage:

- Wide range of applications;
- Huge range of accessories;
- Pulsed Xenon lamp reduces photobleaching of samples;
- Large convenient sample compartment;
- User-friendly FL WinLab software;
- The LS-55 is highly sensitive and flexible, and is ideal for research applications; it has holographic gratings to reduce stray light, as well as automated polarizers;
- The LS-45 is a sturdy workhorse, well-suited for accurate and reproducible routine analyses;
- Choose from variable (LS-55) or fixed (LS-45) slits;
- Based on decades of experience with fluorescence spectroscopy.

Principle	Computer controlled ratioing luminescence spectrometer with the capability of measuring fluorescence, phosphorescence or
	chemiluminescence, and bioluminescence. Pulse rate, delay and gate times can be varied.
Source	Xenon flash lamp, publed at line frequency (50 or 60 Hz). Puble width at half peak height < 10µs, power equivalent to 20 kW at continuous operation. Delay (xd) and gate time (tg) can be varied to measure phosphorescence.
Optics	Source can be carried on the measuring cheminaninescence and containinescence. Monit-Gilleson type monochromators using low stray light, holographic gratings cover the following ranges: Excitation 200-680 nm with zero order selectable Emission 200-650 nm with zero order selectable (standard photomultiplier)
	200-900 nm with zero order R928 photomultiplier (optional) Synchronous scanning Is available with constant wavelength or constant frequency difference. Excitation spectra are automatically corrected. An excitation fifter wheel is incorporated into the optical unit and inserts a 390 nm cut-off filter as an excitation spectrum is scanned through 410 nm. Excitation and Emission Polarters consisting of 2 fifter wheels, each with horizontal and vertical polarizer elements are included.
Wavelength accuracy	+ 1 nm
Wavelength reproducibility Spectral bandpass	+ 0.5 nm The excitation slits 2.5-15 nm and emission slits 2.5-20 nm can be varied and selected in 0.1 nm increments.
Scanning speed	The scanning speed can be selected in increments of 1 nm from 10–1500 nm/minute. Data can also be collected with respect to time.
Emission filters	Computer selectable cut-off filters, 290, 350, 390, 430 and 515 nm, a blank (to act as a shutter), a 1 % attenuator, and a clear beam position
Sensitivity	Ninimum signal-to-noise level using the Raman band of water, excitation 350 nm, is 750:1 RMS measuring noise on the Raman peak, and 2500:1 RMS measuring noise on the baseline.
Standard sample holder	A single position water thermostatted holder for 10 mm cuvettes.
Accessories	Pront Surface accessory LC Flow Cell accessory Remote Fiber Optic accessory 510 Autosampler
Computer controlled accessories	Single position water thermostatted stirred cell holder. Four position water thermostatted automatic cell changer. Excitation and emission polarizers with 40 msec signal sampling. Sipper accessory. Well plate reader accessory available with standard or far-LIV fiber optics. Total emission accessory. Biokinetic accessory. Fast filter accessory.
Data acquisition	Instrumental parameters are controlled by FL WinLab software, which is installed in the Windows environment. The luminescence intensity and the excitation and emission wavelengths can be displayed in real-time. Spectral and time drive data are displayed in real-time and can be stored on disc.
Data analysis	Routines are available for performing mathematical calculations on stored data. These Include arithmetic functions, smoothing, 1-4th order derivatives, area, peak, normalization, merge, difference, interpolate. Specific applications programs are provided for determining intracellular ion concentration and simple quantitation.
Data output	Presentation quality output is available using the Report Builder program.
Data system	Intel® Pentium 4 or equivalent, 1.6 GHz processor, or equivalent
processor	At least 1 GB of Random Access Memory (RAM) The capability of displaying at least high color (16 bit) at 1280 x 768 40 GB Hard disk with at least 1 GB free space as an NTF5 drive CD-ROM drive, 1 RS232 port, 1 USB port Operating System: Windows [®] 7, 32 bit operating system required Note: F. Winda bvill operate under Windows [®] 7, 32 bit.
Power requirements	90 – 132 VAC, 50/60 Hz, 2A 200 – 264 VAC, 50/60 Hz, 1A
Dimensions	265 mm high, 790 mm wide, 680 mm deep (Including sample compartment).

PROCESS PRINCIPLES:

The LS 55 is built on PerkinElmer's heritage of sensitivity and reliability. A wide range of automated accessories have also been developed for the system making it the system ideal for bioresearchers conducting:

- Microplate-based measurements
- Polarization
- Anisotropy assays
- Intact cell work
- Analysis of protein suspensions

Our monochromator based LS 55 uses a high energy pulsed Xenon source for excitation. The variable slit and holographic gratings provide flexibility with very low stray radiation. We've incorporated holographic gratings to further reduce stray light and improve the system's already impressive performance. And a newly designed reference signal system has been added to provide users with much more control over signal dynamics. This is particularly useful for samples with widely differing intra-sample signal size.

For example, the LS 55 signal system has reduced noise by a factor of about 5 for intracellular ion analyses, and increased data transfer rates by a factor of 10.

The FL WinLab[™] software is designed for demanding laboratories. It seamlessly combines PerkinElmer's extensive application specific knowledge and instrumentation control with the ease-of-use provided by the Windows[®] operating environment.

Specific modes of instrument operation such as Scan, Time Drive, and Ratio Data Collection can be easily accessed from the Applications Menu. Excitation and emission monochromators can be independently or synchronously scanned, while the Prescan mode is ideal for method development and locating of peak excitation and emission maxima.

FL WinLab includes a validation protocol that automatically checks the instrument performance to ensure that it is operating within specification. With its unique set of accessories and software applications, the LS 55 offers the most powerful and flexible system for data collection and analysis.

Measurement modes for the LS 55

• Fluorescence, phosphorescence and bio- and chemi-luminescence-measurement modes

• Excitation, emission, constant wavelength synchronous, and constant energy synchronous spectral scanning

- 3D excitation/emission scans, 3D synchronous and kinetic scans
- Microplate measurements with fixed wavelength, wavelength program or automated spectral data collection
- TLC plate, electrophoresis gel or other flat sample types can be analyzed with our Plate Reader accessory
- Single and multiple wavelength kinetics
- Simultaneous kinetics for multiple samples
- Simple quantitation by curve fitting with a number of fit algorithms

• Intracellular ion analyses

The LS 55 includes a single cell thermostatted sample holder that can accommodate 1 cm pathlength cells as well as semi-micro cuvettes with or without stirring. Semi-micro cuvettes are particularly useful where the sample is precious or volume is limited such as cell cultures and DNA samples.

The system also includes an automated Polarizer that consists of two filter wheels; each wheel containing a horizontal and vertical polarizing element. Polarizer positions are software controlled and can be manually set or automatically controlled for polarization, anisotropy or G-factor. Additional accessories are discussed below.

(http://www.perkinelmer.com/lab-solutions//resources/docs/PRD_Flexibility.pdf)

Few implemented projects:

- license works and dissertation students
- doctoral and postdoctoral work
- research in projects