



BD LSRFortessa™ Cell Analyzer

Technical Specifications

The BD LSRFortessa™ cell analyzer puts the power of the BD LSR platform into a compact footprint. It can easily fit on the benchtop for more cost-effective space utilization. The instrument delivers the optimal sensitivity and resolution required for multicolor applications. The BD LSRFortessa cell analyzer can be used to detect up to 18 colors simultaneously and supports up to 4 lasers, and is upgradeable to 7 lasers through the special order program. In addition to the reduced size, design innovations make filters and detectors more accessible for easier setup of new experiments.

Through the BD special order program, customers can upgrade the BD LSRFortessa to support more lasers, choosing from 16 different wavelengths and a wide range of powers. This flexibility allows users to configure the instrument to meet their exact requirements for advanced assay development.

Optics

Excitation Optics

Excitation Optical Platform

The BD LSRFortessa optical layout allows for up to four* lasers.

Laser Power

355 nm: 20 mW

405 nm: 50 mW

488 nm: 50 mW

640 nm: 40 mW

Optical Efficiency

Power loss at flow cell: <20% of specified laser power

Flow Cell Design

Rectangular quartz cuvette:

Internal cross-section, 430 x 180 μm

External quartz cuvette surfaces are anti-reflective coated for optimal transmission of laser light.

Fixed optical assembly with spatially separated laser beams.

Emission Optics

Optical Coupling

The quartz cuvette flow cell is gel-coupled by refractive index-matching optical gel to the fluorescence objective lens (1.2 NA) for optimal collection efficiency.

Forward Scatter Detection

Photodiode detector with a 488/10 bandpass filter

Side Scatter Detector

Photomultiplier tube (PMT) with a 488/10 bandpass filter

Emission Optical Design

Emitted light from the gel-coupled cuvette is delivered by fiber optics to the detector arrays. The BD LSRFortessa uses BD's patented octagon- and trigon-shaped optical pathways that use signal reflection to maximize signal detection. Please see the separate filter guide for information on dye and filter options.

Performance

Fluorescence Sensitivity

FITC: 80 molecules of equivalent soluble fluorochrome (MESF-FITC)

PE: 30 molecules of equivalent soluble fluorochrome (MESF-PE)

PE-CyTM5: 10 molecules of equivalent soluble fluorochrome (MESF-PE-CyTM5)

APC: 70 molecules of equivalent soluble fluorochrome (MESF-APC)

FITC and PE measurements performed using SPHEROTM Rainbow Calibration Particles (RCP-30-5A)

PE-Cy5 and APC measurements performed using SPHERO Ultra Rainbow Calibration Particles (URCP-38-2K)

Fluorescence Resolution

Coefficient of variation PI: Area of <3%, full G₀/G₁ peak for propidium iodide (PI)-stained chicken erythrocyte nuclei (CEN)

Fluorescence Linearity

Doublet/singlet ratio of 1.95–2.05 for CEN stained with PI and excited with the 488-nm blue laser

Forward and Side Scatter Sensitivity

Enables separation of fixed platelets from noise.

Forward and Side Scatter Resolution

Scatter performance is optimized for resolving lymphocytes, monocytes, and granulocytes.

Side Scatter Resolution

Enables separation of 0.5- μm beads from noise.

Forward Scatter PMT Option

A forward scatter PMT upgrade is available for small particle detection through the special order program.

Data Acquisition Rate

40,000 events/sec with beads.

Fluidics

Sample Flow Rates

Front key panel provides three modes: RUN, STANDBY, and PRIME

Continuously adjustable flow rate, plus three preset flow rates:

LO: 12 $\mu\text{L}/\text{min}$

MED: 35 $\mu\text{L}/\text{min}$

HI: 60 $\mu\text{L}/\text{min}$

Standard Fluidic Reservoirs

One 8-L sheath container and one 10-L waste container provided.

Recommended Fluidics Option

BD FACFlowTM supply system: automated fluidics system, which includes a rolling cart and two 20-L Cubitainer[®] packages

*The BD LSRFortessa can be further customized through our special order program to include up to 7 lasers. New laser options are available through the special order program. New laser options are developed on a regular basis. Please check with your local sales representative for the latest wavelength and power options.

Data Management

Software: BD FACSDiva™ v6.2 or later

Workstation†

Operating System

Windows® XP Professional SP3

Processor

Intel® Core™ 2 Duo processor, 3.0 GHz

RAM

HP 2 GB (2 x 1 GB) DDR2-800 ECC

Hard Drives

HP 80 GB SATA/3 Gb/s 7,200 rpm HD (1st slot)

HP 250 GB SATA/3 Gbs NCQ 7,200 rpm HD (2nd slot)

DVD Drive

HP 16x DVD+/-RW, SuperMulti SATA

Networking

Integrated Broadcom Gigabit 10/100/1000 ethernet

Broadcom 5751 NetXtreme® Gigabit PCIE NIC Ethernet

Options

Monitor Options

Two 19-in. LCDs, 2560 x 1024 resolution (standard)

One 22-in. LCD, 1680 x 1050 resolution (optional)

One 24-in. LCD, 1920 x 1200 resolution (optional)

Printer Options

Options vary by location. Please check with your local sales representative.

High Throughput Option

The BD™ High Throughput Sampler (HTS) option is available to increase your lab productivity by acquiring samples from a 96- or 384-well microtiter plate.

The HTS can be front or side mounted on the BD LSRFortessa.

HTS Throughput

Acquisition: Less than 15 minutes per microtiter plate in high throughput mode using a 2-second acquisition, less than 44 minutes in standard mode using a 10-second acquisition

Carryover‡

<0.5% HT mode

<0.75% STD mode

†Minimum configuration listed. Workstation may include upgraded specifications.

‡High-throughput mode (HT) based on a 2-second sample acquisition. Standard mode (STD) based on a 10-second acquisition. Carryover based on testing performed with beads and peripheral blood mononuclear cells. Other cell types may require optimization of HTS parameters.

Installation Requirements

Dimensions (H x W x D)

38 x 36 x 30 in.
(96.5 x 91.4 x 76.2 cm)

Weight

~440 lb (199.6 kg)

Temperature Operating Range

66–79°F (19–26°C)

Humidity

10% to 90% relative, non-condensing

Heat Dissipation

2353 BTUs per hour

Power

Operation at 100/115/230 VAC
and 50 or 60 Hz

Maximum power: 1,500 watts

Noise

<70 dB

Air Supply

None required

Electrical Requirements

BD requires one dedicated circuit for the cytometer and the computer system (including printer) with a dedicated AC source not shared with any other equipment. The instrument will be powered from the line conditioner supplied by BD Biosciences.

Regulatory Status

BD Biosciences certifies that the BD LSRFortessa cell analyzer conforms to relevant directives to bear the CE mark. It also conforms to the UL and CAN/CSA general requirements (61010.1). The BD LSRFortessa flow cytometer is a Class I (1) laser product per CDRH regulations and EN/IEC 60825.

Class I (1) laser product.

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