

BD LSRFortessa™ X-20 Cell Analyzer

Technical Specifications



The BD LSRFortessa™ X-20 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 X-20 cell analyzer can be used to detect up to 18 colors simultaneously and supports up to 5 lasers. 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 choose from 22 different wavelengths and a wide range of power options. 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 X-20 optical layout allows for up to five lasers.*

Laser Power

355 nm: 15 mW
405 nm: 50 mW
488 nm: 50 mW
561 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 (BP) filter

Side Scatter Detector

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

Emission Optical Design

Emitted light from the gel-coupled cuvette is delivered by fiber optics to the detector arrays. The BD LSRFortessa X-20 uses configurable polygon-shaped optical pathways that use signal reflection to maximize signal detection. Please see the filter guide at bdbiosciences.com 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-Cy5™: 10 molecules of equivalent soluble fluorochrome (MESF-PE Cy5)

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

FITC and PE measurements performed using SPHERO™ 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 G_2/G_1 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. Requires the 100-mW, 488-nm blue laser.

Data Acquisition Rate

40,000 events/sec with beads

Fluidics

Sample Flow Rates

Front button 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 FACFlow™ supply system: automated fluidics system, which includes a rolling cart and two 20-L Cubitainer® packages

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Data Management

Software: BD FACSDiva™ v8.0 or later

Workstation†

Operating System

Microsoft® Windows® 7 Professional 32-bit OS SP1

Processor

Intel® Xeon® E3-1240v3 3.4 GHz CPU

RAM

4 GB

Options

Monitor Options

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

One 23-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 X-20.

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% High-throughput mode

<0.75% Standard mode

Installation Requirements

Dimensions (H x W x D)

76.2 x 73.7 x 76.2 cm (30 x 29 x 30 in.)

Weight

~159 kg (~350 lb) depending on configuration

Temperature Operating Range

66°F–79°F (19°C–26°C)

Humidity

10% to 90% relative, non-condensing

Heat Dissipation

~2,700 BTU per hour depending on configuration

Power

Operation at 100/120/230 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.

Compliance with Safety Standards

UL 61010 (US)

IEC 61010 and IEC 60825 (Europe)

CAN/CSA - C22.2 No. 61010 (Canada)

**New laser options are available through the special order program, and are developed on a regular basis. Please check with your local sales representative for the latest wavelength and power options.*

†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.

Class 1 Laser Product.

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