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-Cy™5: 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_0/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 µL/min

MED: 35 µL/min

HI: 60 µL/min

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

Recommended Fluidics Option
BD FACSFlow™ supply system: automated fluidics system, which includes a rolling cart and two 20-L Cubitainer® packages

BD

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
66ºF–79ºF (19ºC–26ºC)

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.

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