



# BD FACSDuet™ Sample Preparation System

The BD FACSDuet™ Sample Preparation System (BD FACSDuet™ System) is an in vitro diagnostic instrument designed to prepare specimens for acquisition on the BD FACSLyric™ Flow Cytometry System. When the BD FACSDuet™ System is physically integrated with the BD FACSLyric™ Flow Cytometry System via the BD FACSLyric™ System universal loader, it provides automatic sample transfer to the flow cytometer, delivering a complete walkaway sample-to-answer solution.

Bidirectional data integration from the BD FACSLyric™ Flow Cytometry System to BD FACSDuet™ System is provided by BD FACSLink™ Software, which also enables Laboratory Information System (LIS) integration.

The BD FACSDuet™ System, integrated with the BD FACSLyric™ Flow Cytometer, is designed to provide complete traceability of specimens, reagents and samples across the system through extensive use of barcodes. Additionally, an audit trail tracks activity on the system in order to support 21 CFR Part 11 compliance.

## The BD FACSDuet™ Sample Preparation System also provides:

- Support for a wide variety of blood collection tubes, both in size (eight different sizes) and from multiple manufacturers (BD Vacutainer® Tubes, SARSTEDT, Greiner and Streck) for a total of 20 different specimen tube types

- Compatibility with multiple reagent vial sizes from a wide range of manufacturers (Beckman Coulter, BioLegend, Cytognos, Dako, Invitrogen and Life Technologies)

The BD FACSDuet™ Sample Preparation System is available as either a BD FACSDuet™ Sample Preparation System (Base) or BD FACSDuet™ Premium Sample Preparation System. The BD FACSDuet™ Premium Sample Preparation System configuration has additional hardware not available on the BD FACSDuet™ Sample Preparation System (Base) model, including centrifuge, wash carousel and additional bulk fluid tanks, to enable user-defined preparation methods that include wash steps.

The BD FACSDuet™ Premium System comes with pre-defined standard workflow templates for prewash/stain/lyse/wash and fix/perm workflows. Users can adapt these templates or design their own user-defined preparation methods. BD Multitest™ IMK, 4C, and 6C IVD Reagents and process controls for lymphocyte subset enumeration have been validated for both configurations. The BD FACSDuet™ Sample Preparation System (Base) can be upgraded to the BD FACSDuet™ Premium Sample Preparation System configuration onsite by BD service engineers.

Unless otherwise noted, specifications in this document apply to both the BD FACSDuet™ Sample Preparation System (Base) and the BD FACSDuet™ Premium Sample Preparation systems. Where differences exist between the systems, both systems will be separately defined.



# Technical specifications

## Instrument

### Dimensions

**Height:** 83.8 cm (33.0 in.)

**Width:** 106.2 cm (41.8 in.)

**Width with touchscreen extended:**  
153.7 cm (60.5 in.)

**Depth:** 74.4 cm (29.3 in.)

### Weight

**With rack loaded, attached workstation, and ready to use (does not include three 10-L tanks):**

BD FACSDuet™ System (Base):  
169 kg (372.6 lb.)

BD FACSDuet™ Premium System:  
177 kg (390.2 lb.)

### Power requirements

100–240 V / 6–2.5 A / 50–60 Hz

### Power consumption

Mean: 420 W

Peak: 600 W

## Environment

### Storage temperature

5–45 °C

### Operating temperature

15 °C (59 °F) to 30 °C (86 °F)

### Operating relative humidity

20% to 80% (non-condensing)

### Operating barometric pressure

≥0.8 atm (approximately 2,000 meters)

### Heat dissipation

<500 BTU/hr

### Noise level

≤ 64 dBA, under normal operating conditions

### Facility requirements

Please refer to the BD FACSDuet™ System Site Preparation Guide for details

### BD FACSDuet™ System table

**Recommended when BD FACSLytic™ and BD FACSDuet™ Systems are physically integrated**

Height: 86.35 cm (33.99 in.)

Length: 200.0 cm (78.74 in.)

Depth: 97.0 cm (38.19 in.)

## Reagent and fluid capacities

### Reagents

On-board reagents are kept in an insulated and light protected reagent bay that only opens when reagents are being pipetted

23 reagent vials per rack, two racks loaded at one time

Reagent adapters are available to accommodate the use of different vials  
Automated reagent cocktailing for up to 45 unique reagents per cocktail

BD Horizon™ Brilliant Stain  
Buffer position

Two 50-mL bulk reagent positions

### Tank capacities

Saline tank: 10 L

DI water tank: 10 L

Waste tank: 10 L

### BD FACSDuet™ System (Base):

Lyse tank: 1 L

### BD FACSDuet™ Premium System:

Bulk fluidic tanks for lyse, fix and other fluids:

2x250 mL

3x600 mL

### 10-L tank dimensions:

Height: 38.1 cm (15 in.)

Width: 16.1 cm (6.3 in.)

Depth: 35.6 cm (14 in.)

## User-definable ranges

### Dispense and fluid volumes

#### Specimen dispense

5–400 µL (in increments of 1 µL)

#### Reagents dispense

5–1,000 µL (in increments of 1 µL)

#### BD Trucount™ Tube Controls

5–50 µL (in increments of 1 µL)

### BD FACSDuet™ System (Base):

BD FACSTM Lysing Solution  
5–1,000 µL (in increments of 1 µL)

### BD FACSDuet™ Premium System:

Bulk fluids tanks via injectors (e.g., wash solution)

2x250-mL tanks (Tanks A and B):

50–450 µL

2x600-mL tanks (Tanks C, D): 100–4,000 µL

1x600-mL tanks (Tank E): 50–4,000 µL

**NOTE:** Tanks A–D can also be accessed by the reagent probe (5–1,000 µL range)

### Reagent multidispense:

Enabled for sets of five dispenses in the following volume ranges:

### Volume ranges:

5–6 µL

16–50 µL

301–450 µL

### Specimen multidispense

Specimen multidispense can be done with the following volumes and number of repeats:

Sample distribution volume range	Maximum number of repeats
20 µL	20
21–49 µL	8
50–74 µL	5
75–99 µL	4
100–133 µL	3
134–200 µL	2

### Aspirate volume (BD FACSDuet™ Premium System only)

#### Minimum volume remaining:

150 µL (1 µL increments)

#### Maximum volume per tube:

4 mL during wash and centrifuge (BD FACSDuet™ Premium System)

2 mL for final transfer to BD FACSLytic™ System

#### Unreachable volumes

Specimen tubes: 250 µL

5-mL amber vials: 130 µL

BD plastic vials (0.5–4 mL): 50 µL

Lyse (BD FACSDuet™ System Base): 170 mL

**Centrifuge:**  
(BD FACSDuet™ Premium System only)

**Speed:** 200g–900g

Holds 16 tubes

Automated centrifuge balancing

**Incubation times:**

0–1,000 minutes (1 minute increments)

**Maintenance protocol**

Instrument priming, rinsing and cleaning procedures as well as probe alignment are preprogrammed

## Performance and settings for IVD assays with BD Multitest™ Assays with BD Trucount™ Tubes

### Dispense volumes

Specimen: 50 µL

Reagent: 20 µL

Lyse: 450 µL

**Incubation times**

Reagent: 15–30 min

Lyse: 15–30 min

### Performance

**Accuracy and precision (A&P) for specimen**

Accuracy: ±3.0% by volume

Precision: CV = 3.0%

**Reagent dispense volume: 20 µL**

A & P for reagents (in single- and multidispense mode)

Accuracy: ±20.0% by volume

Precision: CV = 10.0%

**A&P for lyse (in single- and multidispense mode)**

Accuracy: ±5.0% by volume

Precision: CV = 5.0%

## System performance for user-definable ranges

**NOTE:** The reagent probe dispenses from the bulk lyse tank on the BD FACSDuet™ Sample Preparation System (Base). The BD FACSDuet™ Premium Sample Preparation System, dispenses from bulk tanks A–D in the bulk fluids drawer. The BD FACSDuet™ Premium Sample Preparation System bulk tank accuracy and precision data below refer to the fluidic system

that dispenses directly into the wash carousel.

### Accuracy

**Specimens**

- 5–10 µL: +/- 1 µL
- >10–49 µL: +/- 10.0%
- >50–400 µL: +/- 5.0%

**Reagent probe**

- 5 µL: +/- 20%
- >5–19 µL: +/- 20.0%
- >20–99 µL: +/- 6.0%
- >99–500 µL: +/- 5.0%
- 1,000 µL (for lysing solution) +/- 5.0%

**Wash carousel (BD FACSDuet™**

**Premium System only)**

**Injector dispense for Tank A and B**

- 50–99 µL: +/- 10%
- 100–450 µL: +/- 6%

**Injector dispense for Tank C and D**

- 100–499 µL: +/- 10%
- 500–999 µL: +/- 6%

**Injector dispense for Tank E**

- 50–99 µL: +/- 10%
- 100–450 µL: +/- 6%
- 450–499 µL: +/- 10%
- 500–999 µL: +/- 6%
- 1,000–4,000 µL: +/- 3%

**Aspiration probe (BD FACSDuet™ Premium System only)**

- 150–299 µL: +/- 35%
- ≥300 µL: +/- 20%

### Precision

**Specimens**

- 5–10 µL: ≤ 20.0%
- >10–49 µL: ≤ 10.0%
- >50–400 µL: ≤ 3.0%

**Reagent Probe**

- 5 µL: ≤ 20%
- >5–19 µL: ≤ 20.0%
- >20–99 µL: ≤ 10.0%
- >99–500 µL: ≤ 10.0%
- 1,000 µL (for lysing solution): ≤ 5.0%

**Wash carousel (BD FACSDuet™**

**Premium System only)**

<5% for all volumes

**Aspiration probe (BD FACSDuet™ Premium System only)**

- 150–299 µL: <15%
- ≥300 µL: <10%

## Carryover

### Specimen carryover

**NOTE:** Carryover was tested using fresh whole blood. This protocol was designed to only measure carryover from the BD FACSDuet™ Sample Preparation Systems. Cell analyzers, specimen types and protocol details can impact carryover and carryover must be validated for user-defined preparation methods.

- BD FACSDuet™ Sample Preparation System (Base)  
<0.02% with specimen dispense
- BD FACSDuet™ Premium Sample Preparation System  
<0.02% (200 ppm) with both the standard and high-stringency wash settings

### Reagent carryover

<0.00002% (0.2 ppm)

## Cell recovery

>80% recovery after 4x wash cycles as compared to manual preparation tested with specimen volumes from 100–300 µL

**NOTE:** Cell recovery was tested using fresh whole blood and may vary based on the specific preparation methods and manual techniques used. Recovery must be validated for user-defined preparation methods.

## Throughput

16 tubes were run through a full 4x prewash, stain, lyse, wash protocol in <185 minutes.\*

## Sample loading

### Primary specimen tube rack

Up to four primary specimen tube racks with tube adaptors

Up to 10 tubes/rack for a total of 40 primary tubes at any given time from multiple providers

## Reagent vial compatibility

The following reagent vial types are natively supported with BD FACSDuet™ System reagent racks and adapters and do not require any manual transfer of reagents.

\* Throughput can vary by protocol. Please consult your BD Application Specialist.

## BD

Glass Amber Vial: 36.8 x 21.8 mm: 5.0 mL  
Glass Amber Vial: 38.1 x 22.0 mm: 5.0 mL  
Plastic Vial: 47.3 x 10.2 mm: 0.5 mL  
Plastic Vial: 47.3 x 10.2 mm: 2.0 mL  
Plastic Vial: 38.8 x 16.0 mm: 4.0 mL

## Beckman Coulter

Glass Amber Vial: 37.6 x 20.4 mm: 5.0 mL  
Glass Amber Vial: 42.5 x 13.5 mm: 1.0 mL

## BioLegend

Plastic Vial: 47.3 x 10.2 mm: 0.5 mL

## Cytognos

Glass Amber Vial: 38.9 x 18.2 mm: 4.0 mL  
Plastic Vial: 46.6 x 10.16 mm: 0.5 mL

## Dako

Glass Amber Vial: 47.0 x 17.7 mm - 6.0 mL

## Invitrogen

Plastic Vial: 47.3 x 10.2 mm - 0.5 mL

## Life Technologies

Glass Amber Vials: 43.8 x 21.8 mm - 6.0 mL  
Plastic Vial: 47.3 x 10.2 mm: 0.5 mL

## Primary specimen tube compatibility

### BD Vacutainer®

13 x 75 mm: 2.0, 3.0 and 4.0 mL  
13 x 100 mm: 6.0 and 7.0 mL  
16 x 100 mm: 9.5 and 10.0 mL

Use BD Hemogard™ Closure or conventional cap (standard rubber stoppers)

The BD FACSDuet™ Sample Preparation System and BD FACSDuet™ Premium Sample Preparation System are Class 1 Laser Products. The BD FACSDuet™ Sample Preparation System and BD FACSDuet™ Premium Sample Preparation System are for In Vitro Diagnostic Use. Sample preparation for user-defined protocols and cocktail functions are for Research Use Only, not for use in diagnostic or therapeutic procedures.

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BD Life Sciences, Milpitas CA, USA

[bdbiosciences.com/duet](http://bdbiosciences.com/duet)

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## Greiner

13 x 75 mm: 2.0 and 3.0 mL\*  
13 x 100 mm: 6.0 and 7.0 mL\*  
16 x 100 mm: 9.0 and 10.0 mL

\*Use Premium or Non-Ridged Pull Cap

## SARSTEDT S-Monovette™

8 x 66 mm: 1.2 mL  
13 x 65 mm: 2.6 mL  
11 x 66 mm: 2.7 mL  
13 x 65 mm: 2.6 and 3.4 mL  
15 x 75 mm: 4.0 mL  
13 x 90 mm: 4.9 mL

## Streck Cyto-Chex™ BCT

13 x 75 mm: 5.0 mL  
2-mL flat

## 96-well plate compatibility

Name
96 Well Plate Corning Standard flat bottom PS
96 Well Plate Corning Standard round bottom PS
96 Well Plate Corning Standard round bottom PP
96 Well Plate Corning Standard conical bottom PP
96 Well Plate Corning Deep 1-mL round bottom PP
96 Well Plate Corning Deep 2-mL conical bottom PP
96 Well Plate Eppendorf Deep 1-mL conical bottom PP
96 Well Plate Eppendorf Deep 2-mL conical bottom PP

## Specimen tube adapter sizing chart

Compatible specimen tubes	
SARSTEDT 1.2 mL	D8 x L66
SARSTEDT 2.6 mL and 3.4 mL	D13 x L65
SARSTEDT 2.7 mL	D11 x L66
BD Vacutainer® 2.0 mL, 3.0 mL and 4.0 mL	D13 x L75
Streck 5 mL	D13 x L75
Greiner 2.0 mL and 3.0 mL	D13 x L75
SARSTEDT 4.0 mL	D15 x L75
SARSTEDT 4.9 mL	D13 x L90
BD Vacutainer® 6.0 mL and 7.0 mL	D13 x L100
Greiner 6.0 mL and 7.0 mL	D13 x L100
BD Vacutainer® 9.5 mL and 10 mL	D16 x L100
Greiner 9.0 mL and 10.0 mL	D16 x L100

## Carrier compatibility

BD FACSLytic™ System 30 tube rack  
BD FACSLytic™ System 40 tube rack  
Use with 12x75-mm BD Trucount™ Tubes and 5-mL K-Resin or Polystyrene or Polypropylene tubes

## Barcode reader

The following barcodes are supported for primary specimen tubes:  
ISBT 128  
Code 128  
Code 39  
Codabar  
interleave 2 of 5 standard barcode reagent vials  
DataMatrix (reagent scanning only)

## Computer

Operating System: Microsoft™ Win 10  
Processor: Intel™ BayTrail J1900  
64-Bit EMB English  
Touch screen

## Data management options

BD FACSLink™ Hardware and Software for LIS connectivity

