

Experience High Speed Sorting

MoFlo XDP Cell Sorter

Blood Banking
Capillary Electrophoresis
Cell Analysis
Centrifugation
Genomics
Lab Automation
Lab Tools
Particle Characterization



Performance

Accelerate cell sorting research beyond past limitations with the first true 32-bit high-resolution 5-decade multi-channel digital system in the history of flow cytometry.

Applications

Increase productivity through rapid response capabilities to tackle the most demanding applications with ease.

Functionality

Highly configurable to meet demanding sorting application needs. Improved light detection and filters provide the sensitivity you need.

Reliability

Stable fluidics are key to successful sorting. MoFlo XDP combines this historic reliability with cutting edge engineering and proven performance.

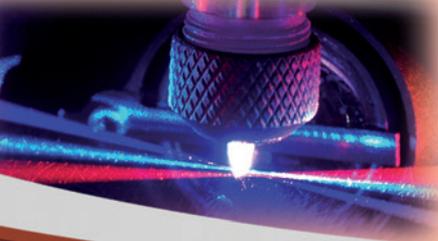
Results

Powerful and responsive, MoFlo XDP allows customized, accurate control of single cell deposition for advanced research possibilities.

Support

Across the globe, a network of technical experts is available to help with all your system support needs. Wherever you are, our world-class customer service and support is dedicated to making sure your sorter functions at peak efficiency throughout its lifetime.

MoFlo XDP Cell Sorter - Setting the Standard.



XDP Electronics

Maximize yield in all sort modes.

- ✓ Zero dead time
- ✓ >100,000 events per second
- ✓ Digital triggering on any parameter
- ✓ Digital pulse processing
- ✓ True dynamic range of 5 decades
- ✓ Unmatched linearity

SP Cells

Identification of side population cells (SP) based on the efflux of Hoechst 33342 and other rare cell populations can be studied using the MoFlo XDP. Excited by a UV laser, Hoechst 33342 blue and red fluorescence is captured and results in a small tail trailing off the main population. This side population of cells is quite rare and can easily be separated at high speeds on the MoFlo XDP thus decreasing the sorting time required.

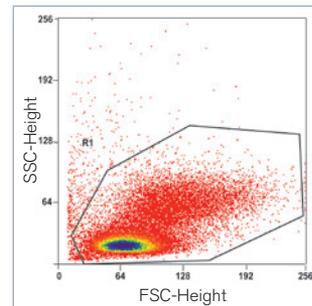
Data courtesy of Susan Majka, PhD., University of Colorado Health Science Center.



Summit Software Version 5.2

Determine regions with full parameter resolution.

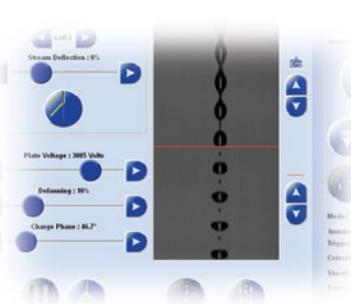
- ✓ Powerful data handling
- ✓ High viability and yield
- ✓ >1 billion event listmode files
- ✓ 18 x 18 Auto-compensation matrix
- ✓ Workspace concept
- ✓ Standard and custom plate sort capability



IntelliSort

Assure purity and yield.

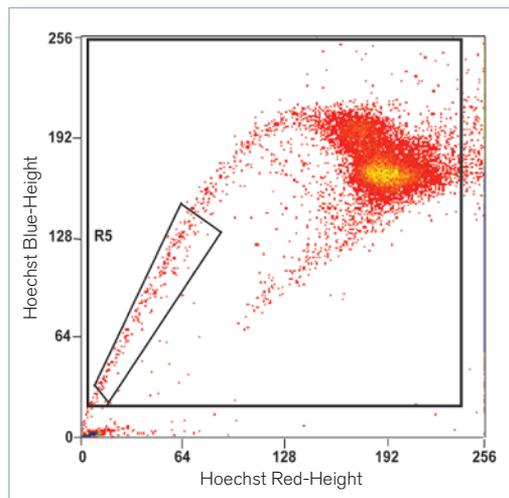
- ✓ Cruise control sorting
- ✓ Walk away operation
- ✓ Pressure and temperature monitoring
- ✓ Improved image quality



XDP Touch Screen Control Panel

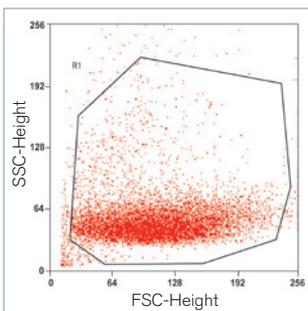
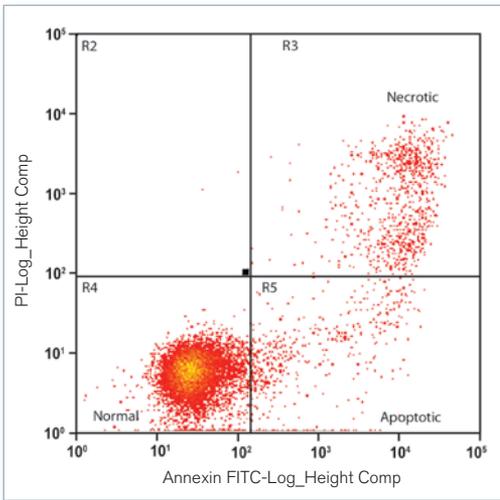
Access intuitive set up and sorting refinements.

- ✓ Individual stream deflection control
- ✓ Simple coarse and fine alignment
- ✓ Droplet control
- ✓ Stream configuration/control
- ✓ CyClone calibration
- ✓ Sort statistics



Apoptosis

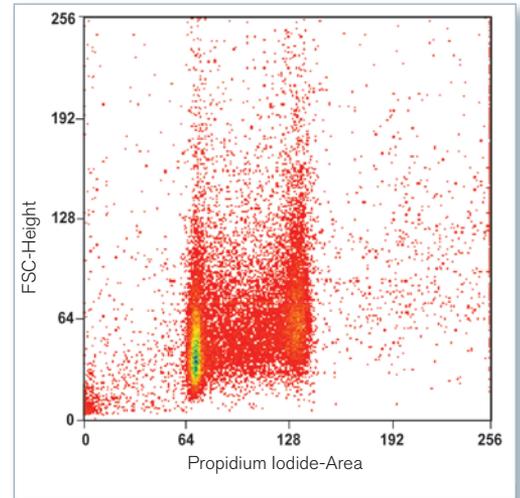
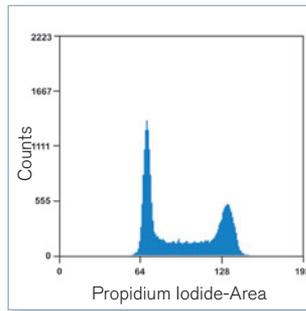
FITC conjugated Annexin V and propidium iodide (PI) can be used to identify cell membrane changes associated with apoptosis as membrane integrity degrades during this process. This staining combination was used to evaluate cells for apoptotic activity using the MoFlo XDP.



Cell Cycle

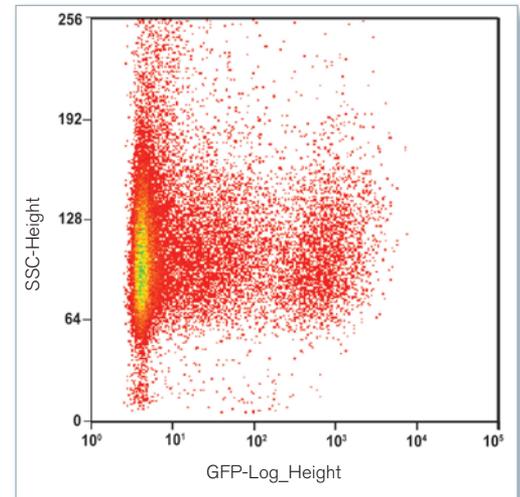
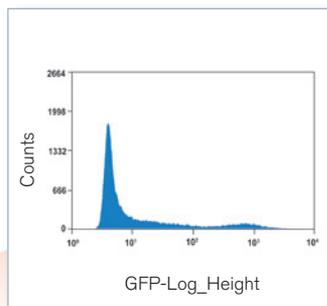
Propidium iodide (PI) can be used to identify DNA content of cells that have been permeabilized to accept the dye where it intercalates into the cellular DNA. Therefore the PI signal intensity is directly proportional to the amount of DNA in the cell. The majority of the cells in the histograms shown are in G0/G1 phase with 1x DNA content (left peak). Cells in G2/M phase appear in the peak to the right and contain 2x DNA. Cells falling between the peaks are in S phase and actively replicating the DNA.

Data courtesy of Lynne Bemis, PhD, University of Colorado Health Science Center.



GFP

Green Fluorescent Protein (GFP) is the most common fluorescent protein and is often used to study protein localization or protein-protein interaction. It is a naturally occurring bioluminescence complex found in the *Aequorea victoria* jellyfish. When isolated from the jellyfish and purified, GFP can be excited by a 488 nm laser line with an emission around 510 nm. The data collected on the MoFlo XDP shows GFP expression following transfection.



MoFlo XDP Specifications

Analysis Rate	100,000 eps
Sort Rate	70,000 eps
Sensitivity	< 150 MESF FITC, <100 MESF PE
Drop Drive Frequency	200 kHz
Optical Parameters	2 scatter and up to 18 fluorescence
Purity	> 99% at all speed
Yield	Poisson 'time of arrival' statistics for 32 parameter + compensation
Plate Deposition	6-1536 wells plus custom configurations
Sort Gates	Up to 32
Analysis Gates	Unlimited
Excitation Lines	Up to 3
Laser Options	Solid State: 488 nm, 200 mW OPSSL; 635 nm, 25 mW Diode; 405 nm, 25 mW Radius; 355 nm, 100 mW, 642 nm fiber coupled with BSO Water-cooled lasers: I90, Krypton series Laser Engine: Fiber delivered 405 nm, 50 mW; 488 nm, 200 mW; 532 nm, 150 mW; 561 nm, 200 mW; 592 nm, 200 mW; 640 nm, 60 mW Custom Lasers: Incorporate additional wavelengths to meet your needs.
Filter Options	Standard filters sets and Hoechst, DAPI, INDO, APC/APC- Cy7
Data Resolution	Up to 5 decades
Nozzle Sizes	8 ranging from 50 µm to 200 µm
Particle Resolution	< 0.2 µm to 25 µm
Compensation	18 x 18 intra-laser compensation
Available Signal	Log, height, area, width, log area for each parameter
System Pressure	4-100 PSI
Software	Summit Software version 5.2, Microsoft Office Professional Edition 2003
Operating System	Microsoft Windows XP Professional

For Research Use Only. Not to be used in diagnostic procedures.
Class I laser product.

Global Service and Support

- ✓ Application specialists
- ✓ Field service engineers
- ✓ Training programs
- ✓ Discussion board/user groups



Partner with Beckman Coulter

- Experience exceptional flow cytometry performance.
- ✓ Industry leader
 - ✓ Worldwide presence
 - ✓ Innovative solutions
 - ✓ Robust and proven platforms

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MoFlo Astrios EQ Series



Cell Sorter Specifications

Excitation Optics

Laser Palette

Wavelength	Stated Power	Beam Profile
355nm	100mW	Elliptical shape
405nm	55mW	Flat-Top shape
488nm	200mW	Flat-Top shape
532nm	150mW	Flat-Top shape
560nm	200mW	Flat-Top shape
592nm	200mW	Flat-Top shape
645nm	100mW	Flat-Top shape

Number of laser interrogation points: 7 discrete spots

Number of pinholes: 7

Standard Filter Sets optimized per laser wavelength:

- 355nm – PI, Hoechst (red and blue), DAPI
- 405nm – Cascade Blue*, Pacific Blue*, Cascade Yellow*
- 488nm – FITC, PE, ECD (PE-Texas Red*), PE-Cy5/PerCP, PE-Cy5.5, PE-Cy7
- 532nm – PE, PE-Alexa* 610, PE-Alexa 647, PE-Cy5.5, PE-Alexa 700
- 561nm – mCherry, DSRed, mPlum, HCRed
- 592nm – Texas Red, APC, APC-Cy7, Alexa 647, Alexa 700, Alexa 750
- 642nm – APC, APC-Cy7, Alexa 647, Alexa 700, Alexa 750

Emission Optics

Resolution: Resolves minimum 0.2µm diameter particles in forward scatter from background

Fluorescence Sensitivity: Fluorescence sensitivity of < 125 MESF for FITC and < 110 MESF for PE using Spherotech** 8-peak beads using 488nm laser

Optical Parameters: Use of up to 7 spatially separated lasers across 44 parameters acquired simultaneously (out of 51 total available)

FLOW-530DS10.14-B

Sort Performance

Drop Drive Frequency: Adjustable up to 200kHz

Sort Purity: > 99% at 70,000 EPS, 70µm nozzle at 60psi, using a Purify sort mode and a starting population of 1% positive events

Sort Yield: Greater than 90% of theoretically predicted yield

Acquisition Rate: Validated to 100,000 particles/sec

Sort Rate: Validated to 70,000 sort decisions/sec

CyClone (Sort Collection)

Plate Deposition:

- 6, 24, 96, 384 and 1,536-well plates
- Custom plate deposition
- Temperature controlled (heated or cooled) with water bath (optional)

Tube Deposition:

- MoFlo Astrios can perform up to 6-way sorting
- Up to 2-way sorting: 1.5, 5, 15 and 50 mL tube sizes (optional)
- Up to 4-way sorting: 3x5 mL plus 1x50 mL (optional)
- Up to 6-way sorting: 1.5 (optional) and 5 mL tube sizes
- Temperature controlled (heated or cooled) with water bath (optional)

Slide Deposition:

- Custom deposits in user defined pattern
- Index sorting is standard

IntelliSort II (Automated Drop Delay and Monitoring):

Using a proprietary algorithm, IntelliSort II is a fully bead-less process to calculate optimal droplet break-off. Upon optimization, IntelliSort II continues to monitor drop break-off.

Electronic Processing

Data Acquisition Parameters

Scatter parameters: Forward scatter (FSC), this includes 2 FSC parameters (EQ model) and Side scatter (SSC), which is only available for the 488 nm laser for all wavelengths ≥ 405 nm

Parameter numbers: Use of up to 7 spatially separated lasers across 44 parameters acquired simultaneously (out of 51 total available)

Available Signal: Log height and log area, linear height, area and width for each parameter

Electronic (Hard) Abort Rate:

- Negligible dead time during analysis

System Linearity: 2.0 ± 0.05 (singlets/doublets ratio for PI-stained CEN cells)

Signal Processing: 32 bits for pulse height parameters with 100MHz sampling

Signal Dynamic Range: 5 decades for log parameters. Scale can be expanded to display 4-9 decades.

Compensation:

- 20X20 digital compensation matrix
- Auto Compensation with Summit Software
- VisiComp with Summit Software

Acquired event capability

> 1 billion events .fcs files with no parameter limit

Fluidics

Jet-in-Air Nozzle: 70 μ m, 100 μ m

Sheath Pressure: 10 – 85psi

Sheath and Waste Containers: Autoclavable 2.5 Gal. (9.45L) sheath and waste tanks

Replaceable Sample Line: Replaceable line from SmartSampler to nozzle

SmartSampler (Sample Input):

- 0.5 mL, 1.0 mL, 1.5 mL, 5 mL, 7 mL, 15 mL, 50 mL tubes accepted. 5mL is the standard. All others are optional.
- Automatic agitation of sample
- Temperature control (-4 to 40°C) with water bath (optional)
- Automatic start-up, backflush and shutdown
- Any tube type (glass, polypropylene, polystyrene, etc.)
- Bubble detector on sample line to prevent air from entering nozzle
- Airtight chamber protects the operator from tube dislodgement or leakage from cracked or defective sample tubes

Fluidics Pressure Control:

- Sample differential and boost are controlled through software for fine adjustments.
- Coarse adjustments for sample, sheath and boost are manually performed.

Biosafety & Design

- Sort Rescue
- Aerosol Evacuation System (optional)
- Replaceable sample tubing and probe (SmartSampler to Nozzle)
- Autoclavable nozzle tip
- Autoclavable sheath and waste containers
- Removable sort chamber door
- Sort chamber with no sharp corners (designed to be easily cleaned)
- Easily cleanable deflection plates
- Quick Release nozzle
- Upper module and hood VHP tested

The Baker Company Class II Biological Safety Cabinet with the MoFlo Astrios installed and operational according to end user conditions was aerosol tested to the following International Biological Safety Cabinet Standards:

- NSF/ANSI International Standard 49- 2012
- European Standard (EN 12469:2000)
- British Standard (BS EN 12469:2000)
- South Africa National Standard (SANS 12469:2000)
- French Standard (NF-095:2006)
- China Standard (SFDA YY- 0569:2005)
- Japanese Industrial Standard (JIS K 3800:2009)
- Australian Standard (AS 1807.1:2009)

*Certifications adhere to local Regulatory Standards.

Regulatory Requirements

- Class I laser product per 21 CFR 1040
- Class 1 laser product per ANSI Z136.1:2007 and IEC 60825-1

For research use only. Not for use in diagnostic procedures.

Class I laser product. All data claims performed using standard instrument laser and filter configurations.

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For more information about the MoFlo Astrios EQ Cell Sorter Series, contact your local Beckman Coulter office or visit: www.AstriosEQ.com

See it. Sort it. Every well, every time.

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Life Sciences

MoFlo Astrios EQ