

Flexible Flow Cytometer

# CyFlow Space

Flexibility for  
Your Changing  
Needs



# CyFlow Space gives you the space you need for your work

**Analysing cells and particles, be it from blood, plasma, tissue, plants, cell cultures or other materials, is an important part of much research and industrial development. To obtain statistically sound results and the confidence to proceed and invest further in your project, you need a high throughput and precise detection of each cell type for your samples. The ability to measure thousands of cells within seconds is a must.**

Flow Cytometry (FCM) is the answer. Since it is a non-destructive method, it reflects the real distribution on a cellular level. Quickly and with utmost accuracy. Of course FCM is not new – it has been a proven technology for over 45 years. But there are vast differences in the available solutions and they need to meet your increasing technological demands in both science and development.

In terms of FCM protocols, new fluorochromes with different spectra are launched to the market regularly. To take advantage of these changes, the ability to work with optimised excitation lights through different colour lasers and suitable optical filter sets is therefore of essential interest. This calls for instruments that can be customised with respect to their configuration, but at the same time remain user-friendly with a straightforward workflow. You want to concentrate on your research and not on a complicated tool.

## The CyFlow Space affords you space to Grow and Adapt

The CyFlow Space is all about offering you flexibility and precision. Thanks to its adaptable configuration, it lets you change in line with your present requirements. And should those needs grow, you can extend it or upgrade it modularly. This kind of flexibility delivers the freedom to operate the instrument in routine settings, in single, specialised research departments or in core facilities with a range of connected working groups. And when you're done with a particular project, you can adapt it to your next challenge.



**Figure 1** CyFlow Space with Autoloading Station for high-speed auto sampling

## Modular System

The CyFlow Space is an open system with high flexibility: from basic configuration up to a multi-laser and multi-parameter system, you're sure to have access to the right tools.

Forget about the limitations of fixed instrument configurations and restricted laser wavelengths. The CyFlow Space lets you adapt your flow cytometer to your individual applications and can accommodate the most complex customised solutions. With more than 10 different lasers, up to 16 parameters and a large range of optical filters to choose from, you can optimise every fluorescence channel as you wish. Upgrades or changes are quick, easy and performed on site if you so wish.

## Application areas

Research field	Industrial field
Biomedical research	Quality control
Microbiology	Industrial biotechnology
Cell biology	Industrial microbiology
Biotechnology	Food & beverage industry
Agroscience	Plant & animal breeding
Marine biology	Aqua culture
Environmental science	Industrial development

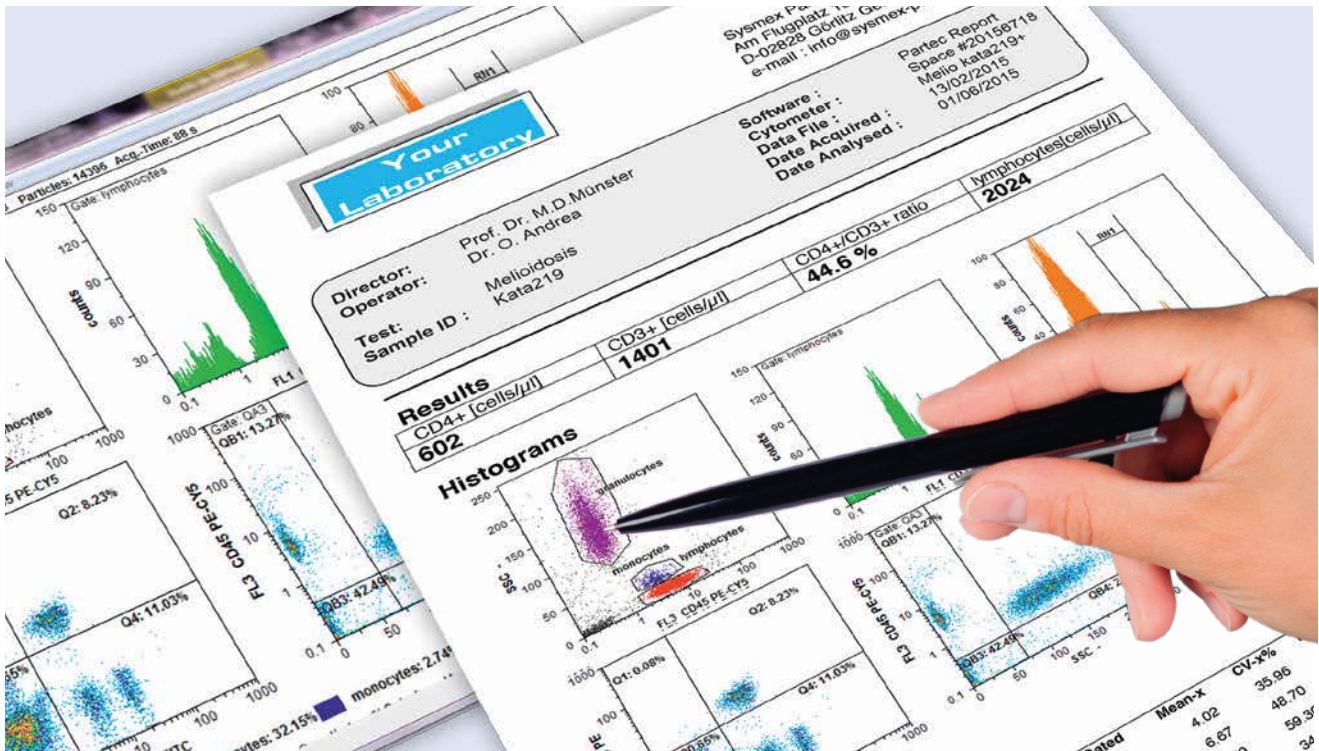


Figure 3 Report of a multi-colour analysis of CD3/CD4/CD45 on CyFlow Space with FloMax software

## Ease of use

The CyFlow Space is simple to operate and gives users easy access to the instrument's full capacities. Taking just five minutes to start up, you can get to work pretty much straight away. And there's no need to hang around during shutdown either – that's quick and easy too.

To further its user-friendliness, the CyFlowSpace's operating software FloMax is intuitive and efficient. It integrates instrument control, including convenient acquisition and analysis, with on- and offline data analysis and a compensation tool in a single software package. Many of its functions are just a click away, such as digital compensation of colour cross talks. Pre-defined and freely adaptable instrument settings and panel modes facilitate switching between different applications.

FloMax is dedicated to applications in immunology, cell biology, microbiology, biotechnology, etc. To ensure compatibility with many of the most common FCM analysis programs, it uses the Flow Cytometry Standard (FCS) data format and lets you generate individual data reports in flexible formats.

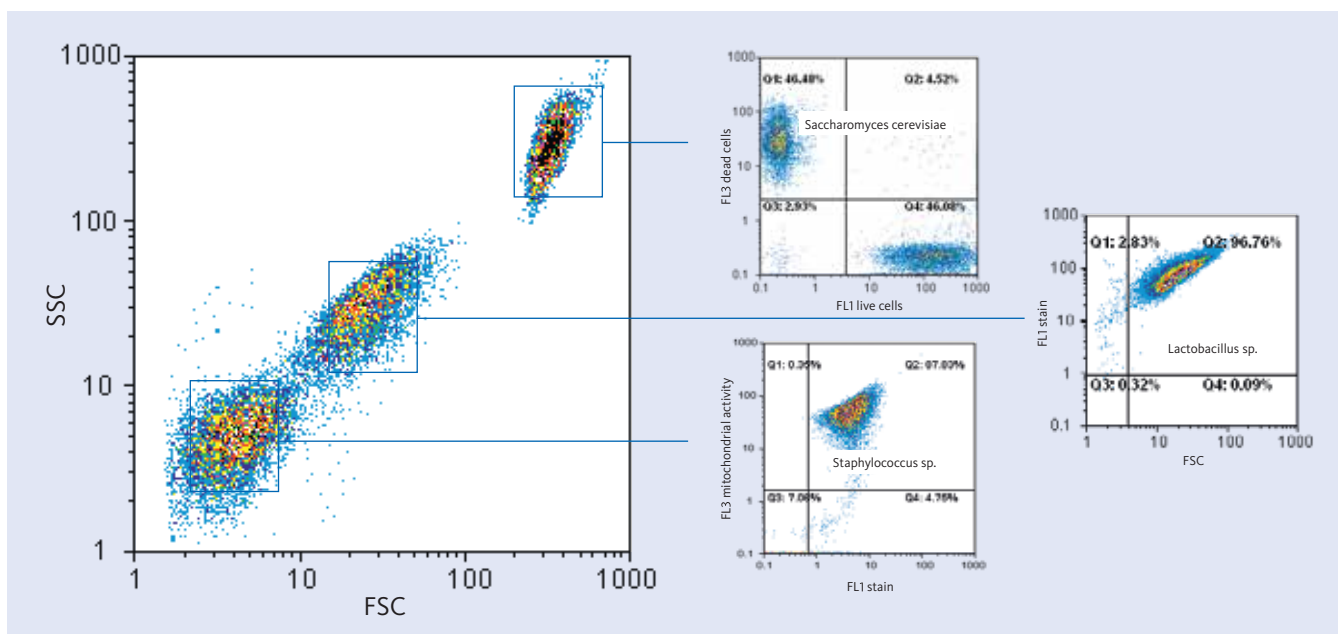
The unique counting principle of 'True Volumetric Absolute Counting' (TVAC) eliminates the need for time-consuming and cost-intensive use of reference beads for counting purposes. And the integrated CCD camera means you can monitor the signal directly on the display to instantly check the sample flow.

## Modular extension possibilities

It's important to us that the devices we deliver find effective, extensive use. As part of the Sysmex FCM concept, the CyFlow Space can be expanded and upgraded modularly by adding an Autoloading Station and other units, such as a piezo-electric cell sorter device. Upgrade options can also mean adding laser light sources, optical parameters and fluorescence channels.

## CyFlow Space Autoloading Station

To achieve higher throughput, you can add the Autoloading Station, which enables automated and accurate uptake of samples with high-speed sample loading. The station performs a flexible sample-to-sample cleaning procedure with lowest carry-over and can read both 96- and 384-well plates.



**Figure 2** Separation of differently sized organisms during a single measurement in a scatter plot: *Staphylococcus* sp. – *Lactobacillus* sp. – *Saccharomyces cerevisiae*. The subsequent analysis comprised mitochondrial activity measurement of *Staphylococcus*, DNA staining of *Lactobacillus*, and viability measurement of *Saccharomyces*.

### **CyFlow Space Sorting Module**

The sorting module is one of Sysmex's unique technical solutions. It works as a closed system and lets you sort cells and particles precisely, stably and with non-destructive high purity. It combines a high-resolution flow chamber with a piezo element and electric activation. In contrast to standard droplet sorters, the process in Sysmex's sorters is smooth and reduces mechanical stress – essential for numerous applications with fragile cell types, such as e.g. neuronal stem cells. As a closed sorting solution, it also offers the advantages of sterile sorting of viable cells for subsequent cell culture and aerosol-free sorting to prevent bio-hazardous exposure.

Other modules, such as a light polarisation component or an anaerobic cabinet, are available on request.

### **A Long History of Quality and Accuracy**

'Made in Germany' we now have 45 years of experience in your market, and our technology has been used with great success and acclaim in various fields in industry, research and development.

The high quality of our instruments within our FCM concept delivers systems with great stability and sensitivity. The high precision of the optical bench in the CyFlow Space system is combined with a powerful electronic and computer system and so forms the basis for real-time signal analysis and processing with high fluorescence and scatter sensitivity.



## Technical specifications

Lasers / LEDs	Detectors	Exemplary dyes
<b>BLUE LASER</b> 488 nm (50 mW fixed/ adjustable to 200 mW)	Green Orange Orange Red Red I Red II Far Red	FITC / GFP / Alexa Fluor 488 PE / YFP PE-Texas Red / PI PE-Cy5 / PerCP PE-Cy5,5 / PerCP-Cy5.5 PE-Cy7
<b>RED LASER</b> 638/640 nm (25/40 mW)	Red I Red II Far Red	APC / APC-Cy5 APC-Cy5,5 / Cy5.5 APC-Cy7
<b>VIOLET LASER</b> 405 nm (100 mW)	Blue Green Orange	Pacific Blue / Alexa Fluor 405 / CFP Cyan / AmCyan / brilliant violet 510 Pacific Orange / brilliant violet 605
<b>UV LASER</b> 375 nm (60 mW) <b>HIGH-POWER UV LED</b> 365 nm	Blue	DAPI / Hoechst 3342
<b>GREEN LASER</b> 532 nm (30 / 100 mW)	Orange Red	mStrawberry / PE mCherry / PI / PE-Texas Red
<b>YELLOW LASER</b> 561 nm (100 mW)	Orange Red	PE / DS Red / PE-Texas Red PE-Cy5 / PI / mCherry / mRuby
<b>ORANGE LASER</b> 594 nm (50 mW)	Orange Red Red Far Red	Texas Red / Alexa Fluor 594 / mStrawberry APC / mCherry / mRFP / JRed mPlum

**Figure 4** Available light sources and exemplary detector configurations

<b>Light sources and optics</b>	Flexible choice of up to 5/3 light sources (stand-alone analyser/with integrated sorter) Modular optical system with up to 16/8 optical parameters with selected PMTs (stand-alone analyser/with integrated sorter) and time parameter Exchangeable optical filters
<b>Flow system</b>	Quartz flow cuvette for laminar sample transport and hydrodynamic focusing Biosafety cleaning system True Volumetric Absolute Counting (TVAC) based on mechanical volume measurement
<b>Electronics and signal processing</b>	Selectable linear, 3- or 4-decade logarithmic scale 16-bit analogue-to-digital converters, selectable trigger parameter Pulse height, area and width analysis for doublet discrimination
<b>FloMax operating software</b>	Based on Microsoft Windows Master licence for instrument control, data acquisition and data analysis Data analysis software for multi-parametric flow cytometry data files in FCS 2.0 or FCS 3.0 standard format
<b>Computer system</b>	Latest industry standard Windows PC with Microsoft Office Microsoft Windows 7 professional 32-bit operating system 22" colour LCD TFT display DVD-RW, USB and Ethernet ports
<b>Options</b>	Immersion gel coupling CyFlow Space sorter module CyFlow Space Autoloading Station with CyPad software
<b>Weight</b>	approx. 37 kg
<b>Dimensions (W x H x D)</b>	main unit: 560 x 300 x 650 mm

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