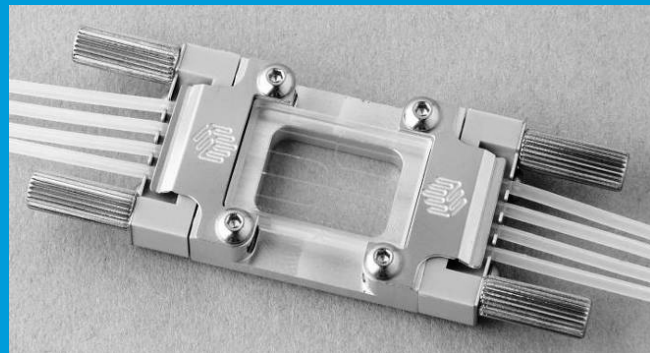
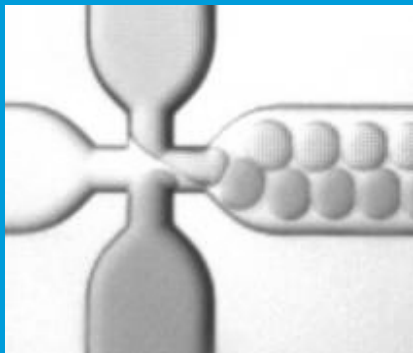


# Droplet Advanced System



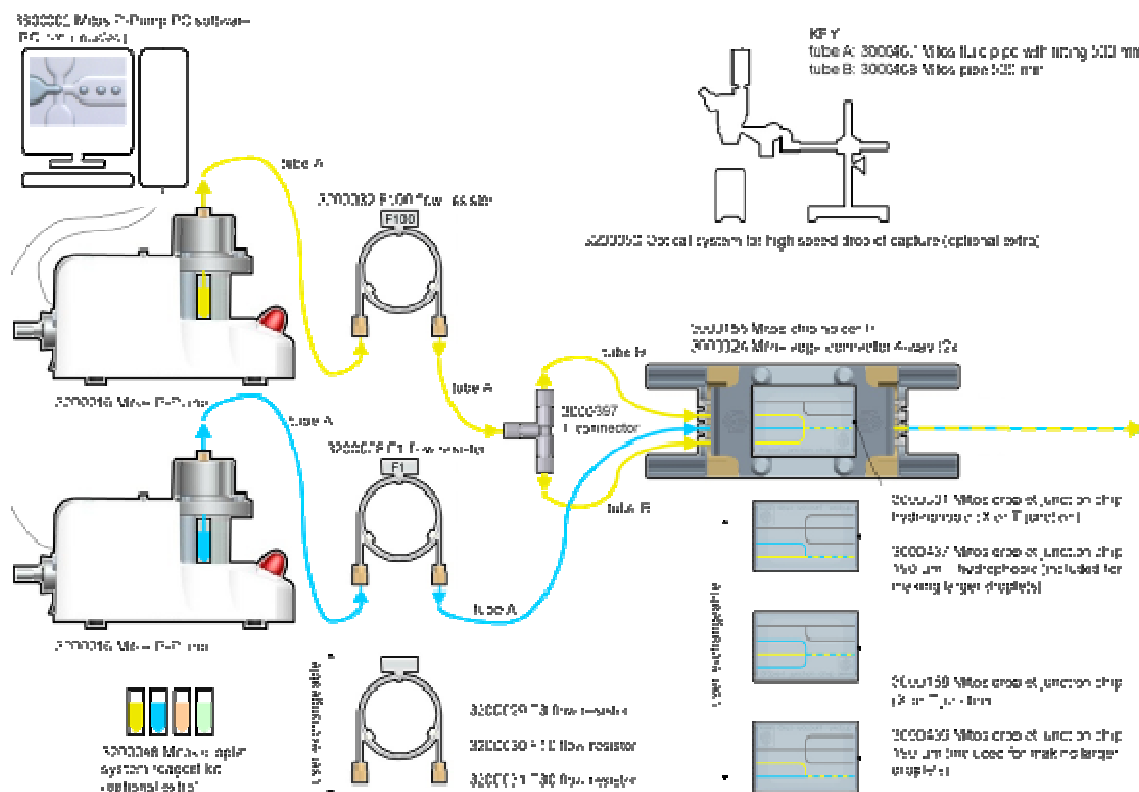
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## Description

Developed for more experienced researchers, the Droplet Advanced System provides a flexible, high-performance solution for droplet microfluidics. Providing a complete solution which contains all required pumps, connectors and chips, this system is ideal for a wide range of development work in droplet microfluidics with potential applications in high throughput chemistry and biology.

The modular system enables users to produce highly monodispersed droplets (aqueous or organic) ranging from  $\varnothing$  10 to 250 $\mu$ m. The Droplet Advanced System provides a pulseless and stable liquid flow, with a wide pressure range of 0 – 10bar.

The pressure driven pumps and flow resistors enable precise control over flow rates and droplet size, providing a highly advanced and flexible solution for droplet formation. In addition, quick changes to flow conditions enable fast optimization of droplet parameters. A broad range of accessories, including high-speed optical systems, larger reservoirs, reagent kits and flow sensors provide an additional level of user flexibility.



**Droplet Advanced System**

## Benefits and applications

### Benefits

- Highly monodispersed droplets ranging from  $\varnothing$  10 to 250 $\mu$ m
- Pulseless and stable liquid flow
- Wide pressure range 0 - 10bar
- Supplied with a set of 5 flow resistors
- Excellent chemical resistance

### Applications

Developed for more experienced researchers, the Droplet Advanced System benefits a wide range of application areas including:

- General and advanced research into the generation of droplets;
- Droplet studies into the wetting properties of sample liquids, droplet stability, droplet production rates, influence of surfactant and junction geometries;
- Feasibility testing and development of concepts in droplet microfluidics;
- Ideal for experimentation requiring precise control of droplet volumes.

## System Components

The Droplet Advanced System is built around Dolomite's industry leading microfluidic pumps, connectors and chips:

- 2 x MitoS P-Pump (Part No. 3200016)
- 1 x Chip Interface H (Part No. 3000155)
- 2 x Linear Connector 4-way (Part No. 3000024)
- 4 x Droplet Junction Chips: Part No. 3000158 - hydrophilic chip with channel depth of 100 $\mu$ m, Part No. 3000301 – Droplet Junction Chip chip with channel depth of 100 $\mu$ m, Part No. 3000436 – Droplet Junction Chip with channel depth of 190 $\mu$ m, Part No. 3000437 – Droplet Junction Chip with channel depth of 190 $\mu$ m
- 5 x Flow Resistor (Part No. 3200028 - 3200032)
- MitoS P-Pump software suite (Part No. 3600002)
- Advanced Droplet Starter Kit containing a selection of tubing and fittings (Part No. 3200075)

The Mitos P-Pump is a 0 – 10bar pressure pump which offers pulseless liquid flow over a wide flow rate range and the capability to pump high viscosity liquids. The Linear Connector ensures that a quick and reliable seal is made every time, so downtime is minimised. This connection system is well suited to droplet microfluidics as the tube interfaces directly to micro-channels at the chip edge. The result is a straight fluidic path, eliminating the flow disruption seen with 90° bends.

All Dolomite droplet generation chips are double etched to give a near circular channel profile, which is important for the generation of consistent, spherical droplets. The chip fabrication process results in highly accurate channel dimensions with very smooth surfaces ( $R_a = 5\text{nm}$ ). These glass chips have excellent optical transparency for clear imaging of droplets. Advanced hydrophobic coating treatments enable water-in-oil droplets to be generated instead of the oil-in-water droplets formed in the untreated chips.

## Specifications

Technical information	Droplet Advanced System
Droplet size range	10 – 250 $\mu\text{m}$
Monodispersity	Very good
Droplet production rate	>10,000 per second
Junction types	X-junction and T-junction (alternative geometries available on request)
Sample volume	30ml
Max pressure	10bar
Pump type	Pulseless pressure driven pump
Independent control of fluid channels?	Yes
Flow resistors required?	Yes
Speed of liquid refill	Fast
Speed of connections	Fast
Flexibility of experimentation	High

## Accessories

There is a broad range of accessories available including:

- Droplet System Reagent Kit – Part No. 3200048
- High Speed Camera and Microscope System – Part No. 3200050
- MitoS P-Pump Remote Chamber 400 – Part No. 3200043
- MitoS P-Pump Vessel Holder Kit – Part No. 3200017
- MitoS P-Pump Starter Kit – Part No. 3200033
- Pneumatic Connector Kit – Part No. 3200034

The Droplet Advanced System is part of Dolomite's Micro Droplet System range which also includes:

- The Pressure-based Droplet Starter System: a basic toolkit for initial work in droplet microfluidics, and
- The Syringe-based Droplet Starter System: ideal for initial concept work and experimentation towards the development of a high throughput droplet system.

## Custom Options

Other chip configurations are available on request. If you would like to generate droplets of a different size, operate without surfactant or create Janus particles, Dolomite can design the junction geometry required. The range of Dolomite services available covers all aspects of the development process from characterization of liquids for droplet generation to the design of commercial instruments in the field of droplet microfluidics. Please contact Dolomite to discuss your application.



**The Dolomite Centre Ltd.**

Unit 1, Anglian Business Park, Royston,  
Hertfordshire, SG8 5TW, United Kingdom

**T:** +44 (0)1763 242491

**F:** +44 (0)1763 246125

**E:** [info@dolomite-microfluidics.com](mailto:info@dolomite-microfluidics.com)

**W:** [www.dolomite-microfluidics.com](http://www.dolomite-microfluidics.com)

**Dolomite Microfluidics**

29 Albion Place  
Charlestown, MA 02129

**F:** 617 848 1211

**F:** 617 500 0136

**E:** [salesus@dolomite-microfluidics.com](mailto:salesus@dolomite-microfluidics.com)

**W:** [www.dolomite-microfluidics.com](http://www.dolomite-microfluidics.com)