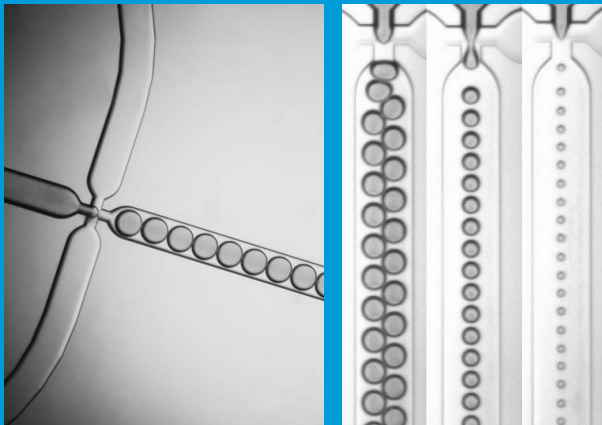


Droplet Collection System



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Description

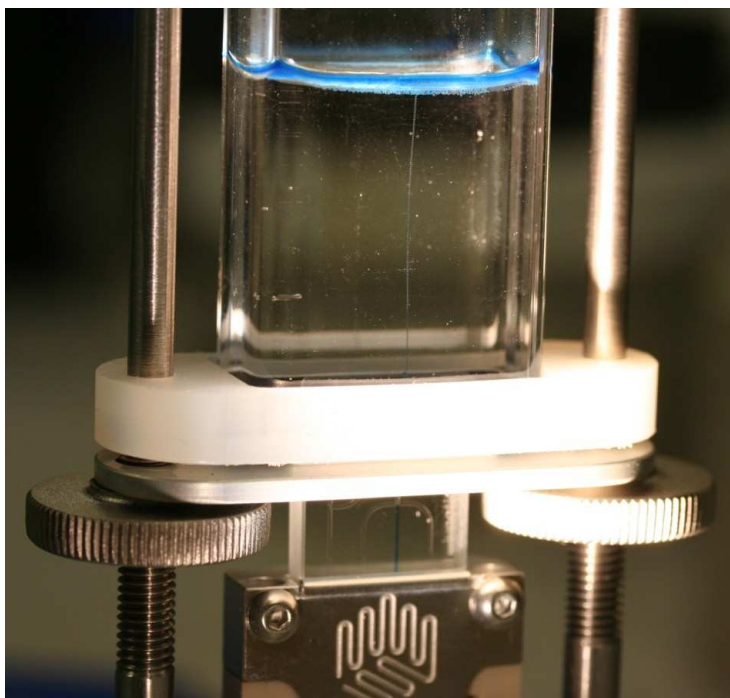
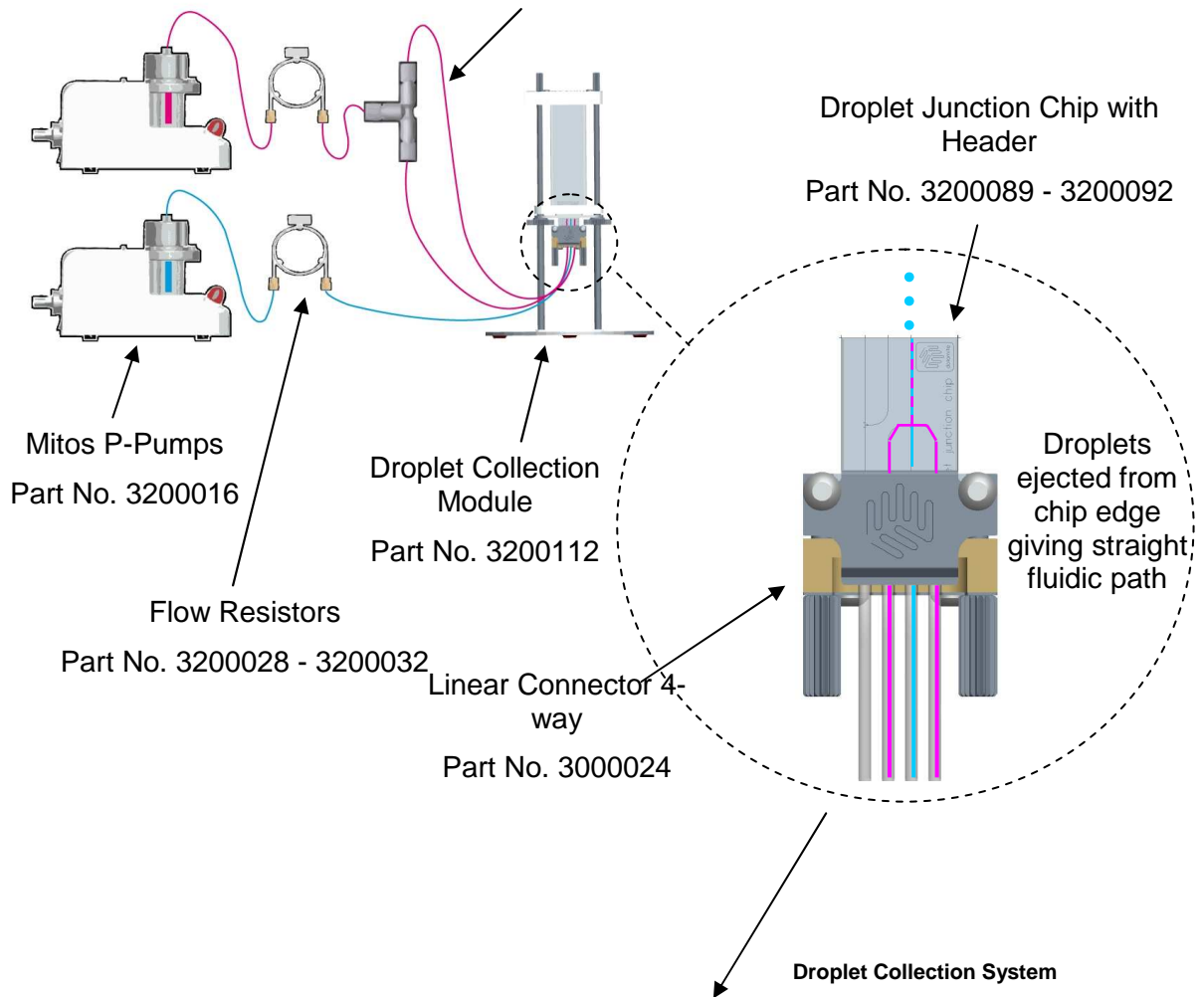
Developed for generation, collection and analysis of droplets, the Droplet Collection System provides a complete toolkit to formulate and collect highly consistent products. This modular system is ideal for research in a range of applications from food science to drug delivery to the synthesis of particles.

With the Droplet Collection System, users can produce emulsions which consist of highly monodispersed droplets (aqueous or organic) ranging from $\text{\O} 10$ to $250\mu\text{m}$. The Dolomite interface from microfluidic chip to collection module enables droplets to be collected without flow disruption and droplet coalescence. The emulsion can be monitored over time or UV cured in the quartz collection vessel. Droplets or particles produced can then be transferred for use in the chosen application.

The Droplet Collection System offers 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 Collection Starter Kit

Part No. 3200124



Benefits and Applications

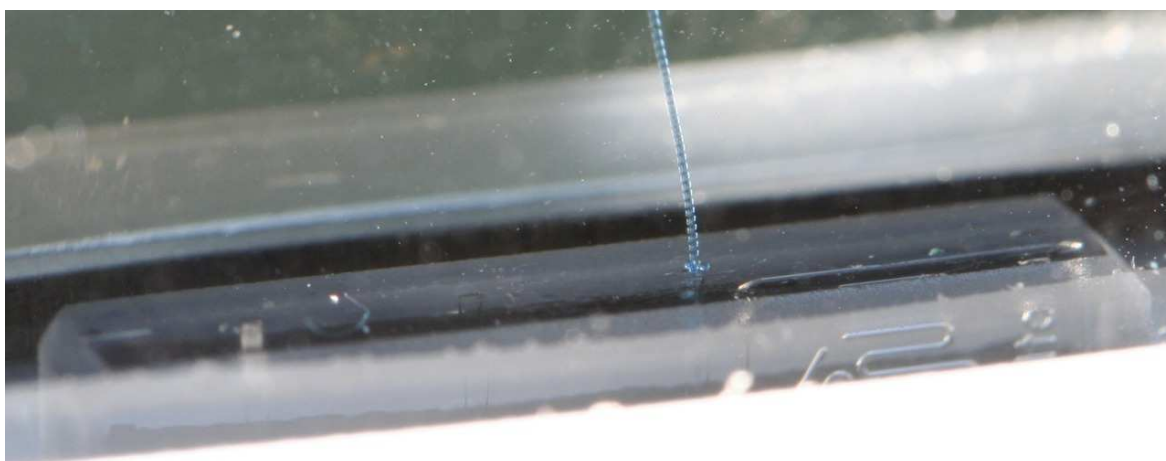
Benefits

- Enables rapid progress to be made in the formulation of droplet products
- Generates highly consistent emulsions due to monodispersity of droplets
- Droplet size range from \varnothing 10 to 250 μ m
- Option to UV cure droplets in collection module
- Straight fluidic path from chip to collection module prevents flow disruption and coalescence
- Pulseless and stable liquid flow
- Wide pressure range 0 - 10bar

Applications

The Droplet Collection System benefits a wide range of application areas including:

- Generation of droplet products for nutrition, cosmetics and materials science
- Design of emulsions for controlled drug dispersion in biological systems
- Synthesis of polymeric microspheres for diagnostics and biotechnology
- Ideal for initial studies and subsequent steps towards scale-up



Oil droplets (with blue dye) in water ejected from chip edge into Mitos Droplet Collection Module

System Components

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

- 2 x MitoS P-Pump (Part No. 3200016)
- 1 x Linear Connector 4-way (Part No. 3000024)
- 1 x Droplet Collection Module (Part No. 3200112)
- 4 x Droplet Junction Chips with Headers: Part No. 3200089 – Droplet Junction chip with channel depth of 100µm, Part No. 3200090 - hydrophobic chip with channel depth of 100µm, Part No. 3200091 – Droplet Junction Chip with channel depth of 190µm, Part No. 3200092 – Droplet Junction Chip with channel depth of 190µm
- 5 x Flow Resistor (Part No. 3200028 - 3200032)
- MitoS P-Pump software suite (Part No. 3600002)
- Droplet Collection Starter Kit containing a selection of tubing and fittings (Part No. 3200124)

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.

The Droplet Collection Module provides an interface directly from chip to collection vessel. The 15 ml flat-sided quartz vessel enables droplets to be viewed or treated. The chip can be inserted into the top or bottom of the vessel, so that sinking or floating droplets can be collected without coalescence.

Specifications

Technical information	Droplet Collection System
Droplet size range	10 – 250µm
Monodispersity	Very good
Droplet production rate	>10,000 per second
Junction type	X-junction
Sample volume	Up to 30ml
Collection volume	15ml
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
- Flow Rate Sensors with Sensor Display – Part No. 3200095 & 3200096 - 3200100
- MitoS P-Pump Remote Chamber 400 – Part No. 3200043
- MitoS P-Pump Vessel Holders Kit – Part No. 3200017
- MitoS P-Pump Starter Kit – Part No. 3200033
- Pneumatic Connector Kit – Part No. 3200034



Droplet Collection System with Mitos High Speed Camera and Microscope System (Part No. 3200050)

The Droplet Collection 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
- The Syringe-based Droplet Starter System: ideal for initial concept work and experimentation towards the development of a high throughput droplet system
- The Droplet Advanced System which benefits a wide range of development work in droplet microfluidics with potential applications in high throughput chemistry and biology.



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.



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