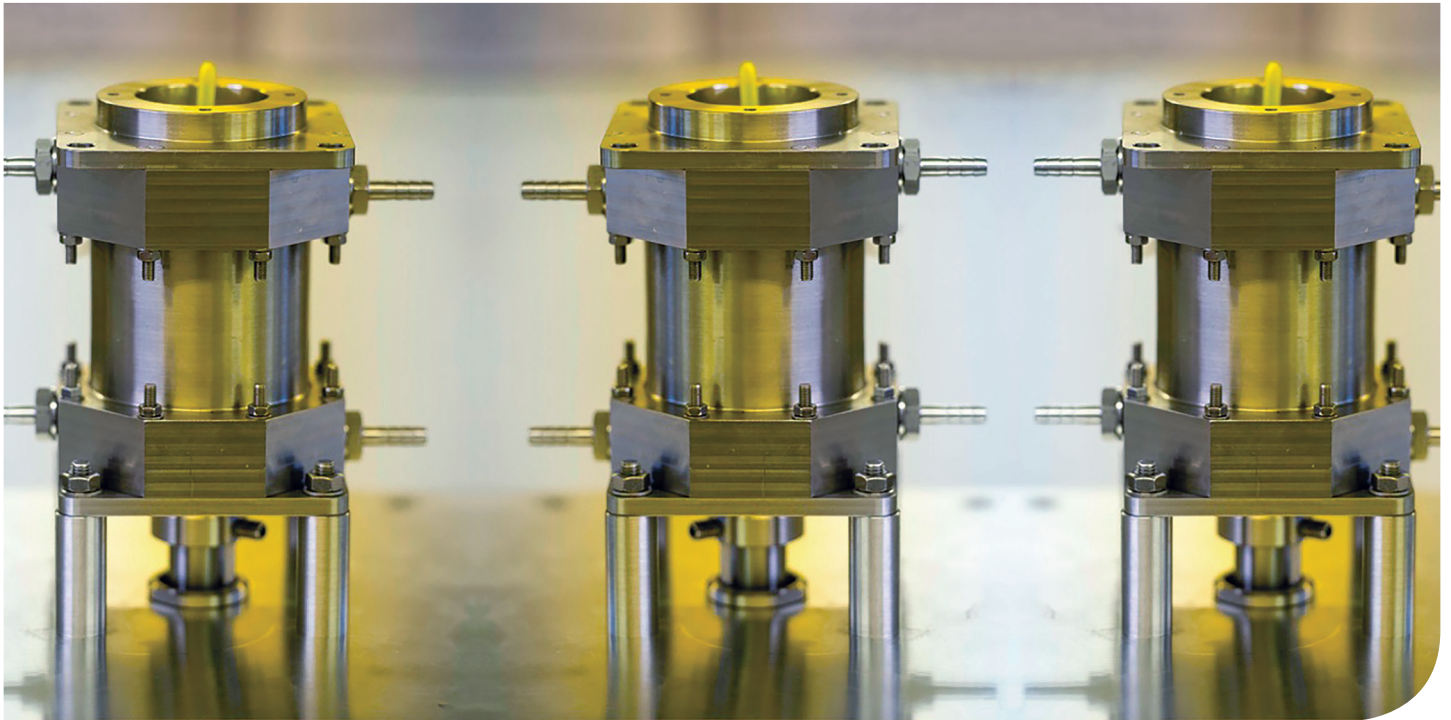


LTS-1



Pilot scale oscillatory unit

The Micropore LTS-1 is designed for large lab / pilot scale testing and comes in a standard configuration. It is the first step in scale-up from proof of principle and formulation development carried out on the Micropore LDC-1 towards a robust manufacturing process. It has a capacity of up to 5 kg/hr of disperse phase.

- Monosized drops and particles - with resulting yield improvements and reduced waste
- Low energy - with resulting preservation of sensitive materials
- Ideal development tool for continuous manufacturing
- Operational stability under different flow rates
- Data shown from membrane area of 50 cm²
- Disperse phase flow rate up to 5 kg/hr.

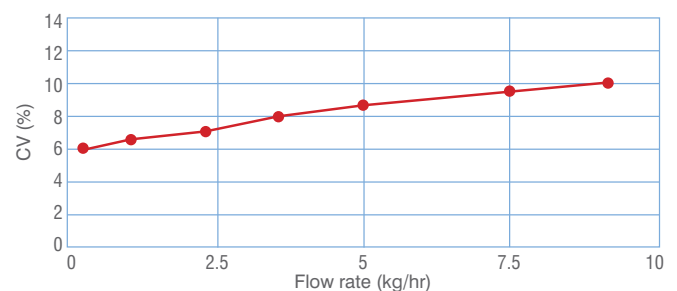
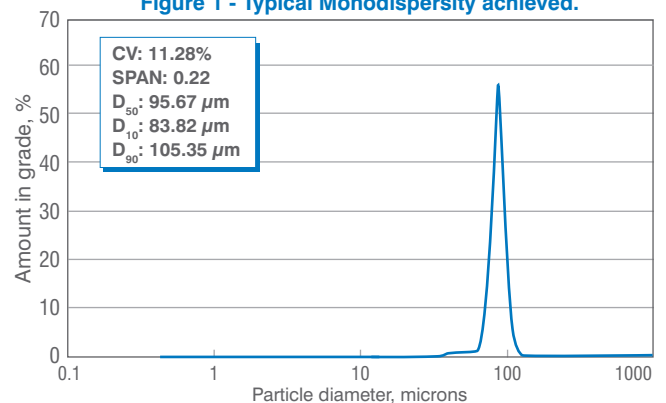


Figure 1 - Typical Monodispersity achieved.



Fully scalable

Micropore's LTS-1 is able to generate quality data to enable scale-up to manufacturing volumes through to manufacturing scale devices which can be configured to meet client requirements.

- Continuous production process
- Multi-tonne/ year capability
- Small footprint
- cGMP / FDA ready

Performance and capability

The Micropore LTS-1 is a development tool to enable a smooth transition from the Micropore LDC-1 to the company's full scale manufacturing products. It operates continuously and is a step on in development from the batch Micropore LDC-1

The Micropore LTS-1 also has the capability of varying each operating parameter independently to achieve the precise conditions for manufacture of extremely narrow size distribution products. It does this through a patented membrane and flowcell

coupled to an azimuthally oscillating motor. Independent control can be exercised over the following parameters to generate precise levels of shear for precise product sizing

- Continuous phase flowrate
- Disperse phase flowrate
- Oscillation amplitude
- Oscillation frequency

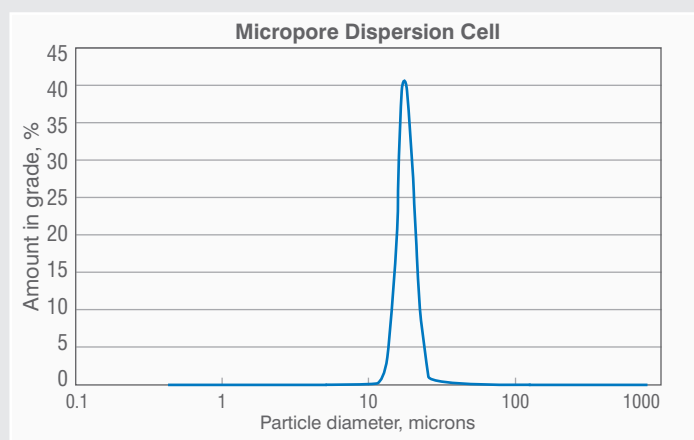
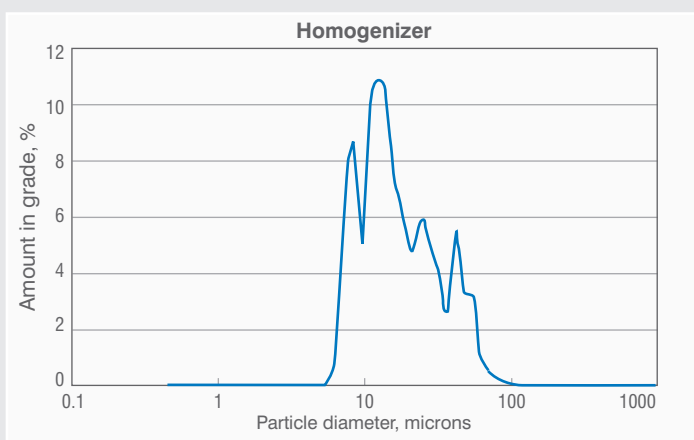
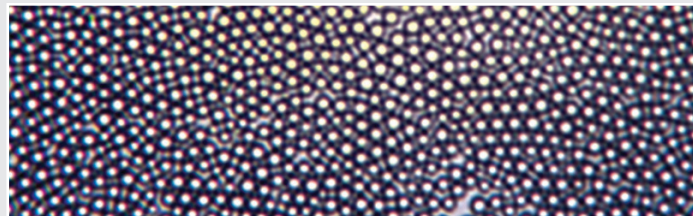
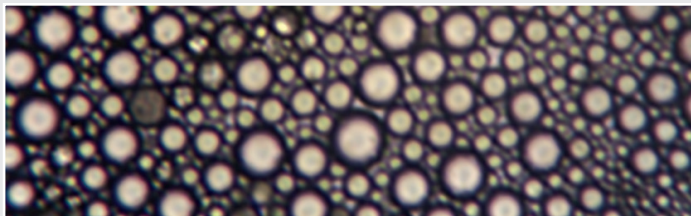
This precision enables clients to develop their formulations in ways that have not previously been possible and to ensure optimal performance and economics of their final formulated product.

Data generated with the Micropore LTS-1 is used to customise the design of the full scale manufacturing unit – the Micropore AXF-1 of CXF-1.

Many clients have developed a suite of products through purchase of the Micropore LTS-1. For those clients who are looking for development of a single product a rental option is available.

Membrane Emulsification Advantages

- Emulsions prepared via membrane emulsification are inherently more stable, as all of the droplets are close to the same size, they will have the same buoyancy, reducing creaming or sedimentation.
- The membrane process uses much lower shear force and so it is more gentle, allowing processing of sensitive materials without damage.
- These emulsions can be post-processed and turned into microcapsules, delivery systems for a variety of actives. Each microcapsule will behave in exactly the same way, reducing variability upon rupture.
- The amount of emulsifier or surfactant can be reduced, providing a reduction in raw material costs.
- A comprehensive body of peer-reviewed literature, describing the benefits of membrane emulsification, is available.
- Because membrane emulsification is a very controlled and highly engineered process a major advantage, compared with traditional methods, is significant reduction in waste and an improvement in on-specification product yield.



When compared with traditional emulsification methods, such as rotor/stator homogenisers, membrane emulsification offers clear benefits.