

# microfluidic encapsulation made easy, scalable and GMP-ready



## Microfluidic Encapsulation

Emultech makes reproducible microparticle formation easy, scalable and GMP-ready. The company is dedicated to the translation of microparticle concepts into production processes. Emultech offers equipment and services for early laboratory development as well as scaled equipment for clinical development and full-scale manufacturing.

## Microencapsulation at a Glance

Microencapsulation is the entrapment of active ingredients in a matrix in order to achieve a pre-defined function. This function can be controlled and sustained release of the ingredient, targeted delivery, protecting or masking the ingredient. The ingredients can be active pharmaceutical ingredients (i.e. small molecules, peptides, proteins or cells), functional food and cosmetic ingredients (i.e. vitamins or minerals).

Our platform allows for the use of a wide variety of matrix materials. Both hydrophobic and hydrophilic formulations are feasible. Typical matrix materials include the commonly used PLA, PLGA, chitosan and alginate. However, specialty polymers can also be used for particle formation.

## Controlled Processing

Microencapsulation in microfluidic systems is widely recognised as the most controlled process for microencapsulation. The unique control and versatility of our platform allows for easy development of novel products and the faster acquisition of the desired particle characteristics, such as size, loading and release profile. Since each particle is individually formed in separate channels, particles have highly uniform characteristics that allow for more effective development and make it easy to scale up.

## cGMP-Ready

Our patented technology is available for research and small as well as large production scale. Production can be maximised through our Mega Disc. Where exact volumes per particle are being researched, Emultech's technology is a world first and so far the only technology with 2100 production channels and thus such large production volumes.

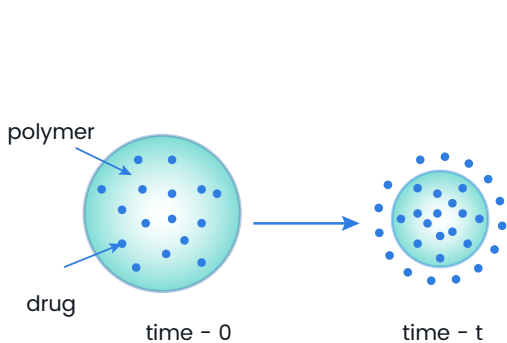


Fig. 1: Drug release over time from microparticle.

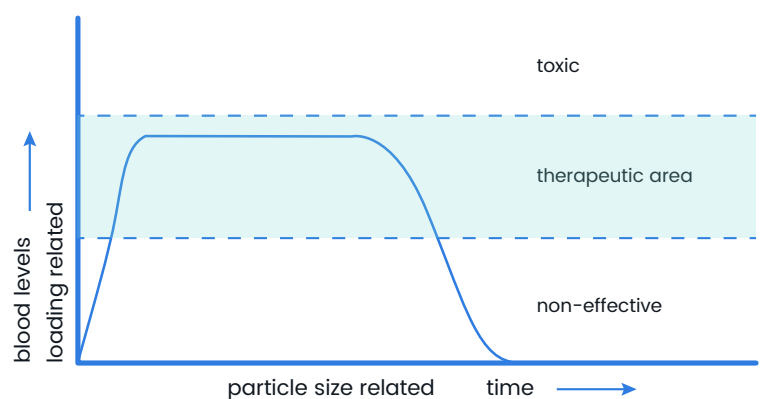


Fig. 2: Sustained release drug delivery.

## Functional Principle

The heart of each of our machines is our unique and patented technology. The machines are user-friendly and help you to identify the right process conditions to obtain the desired results quickly. The technology guarantees high consistency between batches. Also, it ensures easy upscaling and translation from the Emultech D to the Emultech P, and subsequent scale-up to clinical and market relevant volumes.

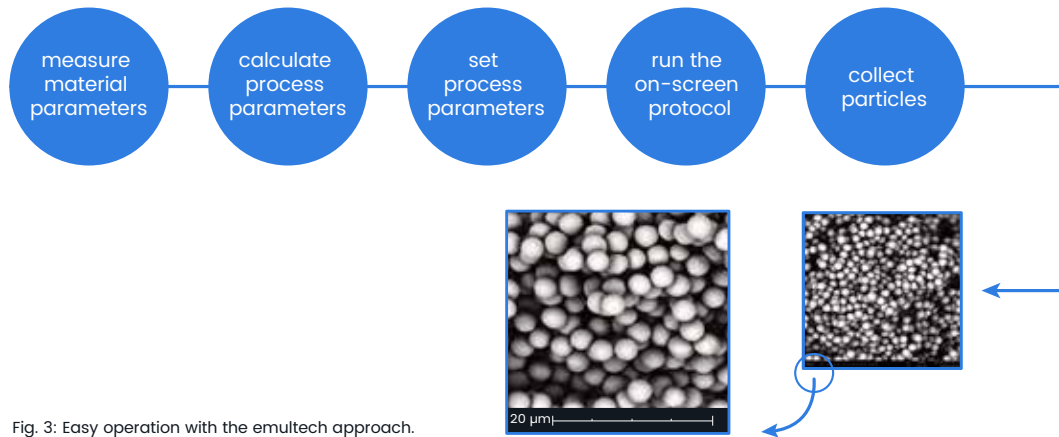


Fig. 3: Easy operation with the emultech approach.

## Benefits

During the development of our platform, Emultech focused on creating an easy-to-use, versatile platform for the development of microencapsulates. A platform that can be used in early research and in development, but also in clinical development and market relevant production. By addressing the three user needs – suitability for many applications, easy scale-up and cGMP readiness – Emultech presents the right tools for the development of microencapsulates.

### Highly Reproducible

- Uniform and narrow size distribution (<1% standard deviation is feasible)
- Model-based process, ensuring batch-to-batch consistency
- Straightforward scale-up

### Benign Process

- Operating conditions at room temperature
- No high shear
- Temperature control is an option

### Easy Sterile Processing

- 0.22 micron filter setup is an option
- Wetted parts autoclavable and transferable to laminar air flow cabinet

### Versatile Platform

- Range of 1 to 1000 micron
- Wide range of carrier materials feasible
- Wide range of active ingredients feasible

### Ease of Use

- Plug-and-play installation
- Simple and easy cleaning through integrated rinsing and disposable parts
- Automated process
- Tabletop set-up
- User-friendly design

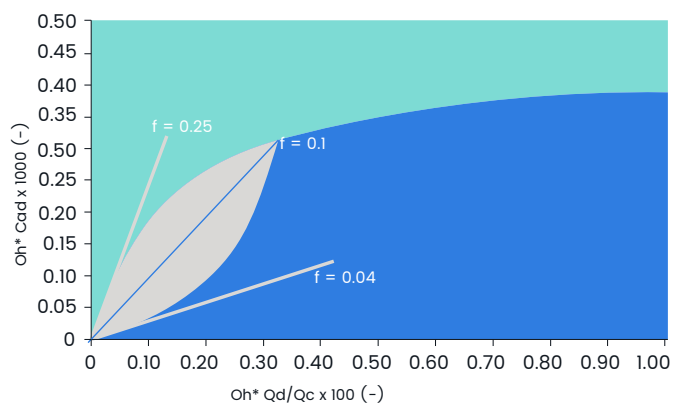


Fig. 4: Solid science behind emultech technology.



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