

## FluoSurf

FluoSurf is a fluorinated surfactant especially designed and optimized to stabilize aqueous droplets in fluorinated oil produced by droplet-based microfluidics for biotechnological applications.

### Contents

Overview.....	2
Benefits.....	3
Product specifications .....	4
How to use FluoSurf .....	4
Applications of FluoSurf .....	5

Part Name	Part Number
FluoSurf neat - 1g	1903-01
FluoSurf neat - 10g	1903-02
FluoSurf neat - 100g	1903-03
FluoSurf 2% in HFE 7500 - 10mL	1903-04
FluoSurf 2% in HFE 7500 - 50mL	1903-05
FluoSurf 4% in HFE 7500 - 10mL	1903-06
FluoSurf 4% in HFE 7500 - 50mL	1903-07
FluoSurf 2% in FC 40 - 10mL	1903-08
FluoSurf 2% in FC 40 - 50mL	1903-09
FluoSurf 4% in FC 40 - 10mL	1903-10
FluoSurf 4% in FC 40 - 50mL	1903-11

For other conditionings or formulations please contact us [contact@emulseo.com](mailto:contact@emulseo.com)

## Overview

Droplet-based microfluidic is an emerging and powerful tool for biotechnological analyses as digital polymerase chain reaction (dPCR) or single cell analysis. Droplets, which behave as microreactors, are formed in microfluidic chips, involving a considerable increase of the number of experiments in a reduced time.

Fluorinated oils are commonly used as continuous phase for these kinds of application because of their low viscosities, their ability to solubilize and transport oxygen, and the non-solubility of chemical and biochemical compounds in these latter.

In order to stabilize aqueous droplets in fluorinated oil in the scale of experiments, fluorinated surfactants are used. FluoSurf is a surfactant soluble in fluorinated oils especially designed and optimized to stabilize droplets for biotechnological analyses.



Figure 1: FluoSurf is available neat or diluted at 2 w/w-% or 4 w/w-% in HFE 7500 or FC 40.

## Benefits

### -Stability

FluoSurf allows the stabilisation of formed droplets from 1  $\mu\text{m}$  to 300  $\mu\text{m}$  with a high production frequency (several 1000 droplets per second) and allows to stabilize droplets at high temperature (up to 95°C)

### - Biocompatibility

FluoSurf is perfectly biocompatible and is ideal to stabilize droplets containing biochemical compounds of biological entities.

### - Purity

Thanks to a well-established post process allowing the elimination of impurities, FluoSurf is obtained with a high purity.

### - Leakage limitation

Thanks to the elimination of impurities involving leakage, hydrophilic and hydrophobic molecules can be efficiently contained within droplets.

### - Reproducibility

FluoSurf production is perfectly reproducible. Each batch is tested in term of structure and performance following a well-established quality control. A certificate of analysis can be delivered for each batch.



Figure 2: Production of aqueous droplets labelled with Rhodamine G6 (100mM) by using FluoSurf 4 w/w-% in HFE 7500.

## Product specifications

Product name	FluoSurf
Available concentrations	Neat, 2 w/w-% or 4 w/w-%
solvents	HFE 7500 or FC 40
Formula	PFPE-b-PPO-PEO-PPO-b-PFPE
Molecular weight	7kD<M <sub>w</sub> <13kD
Charge	Neutral
Surface tension	4 mN/m
Critical micelle concentration (CMC)	0.03 w/w-%
Hazards	Not classified hazardous. MSDS available on Emulseo website
Biocompatibility	Biocompatibility has been tested with plankton, yeast, E. Coli and mammalian cells
Microfluidic chip compatibility	Emulseo recommends to carry out a fluorophilic surface treatment on the microfluidic chips for the use of FluoSurf diluted in fluorinated oil as continuous phase
Storage conditions	Store in a cool, dry, temperature consistent environment. The product can be refrigerated if desired. FluoSurf is shipped in amber glass bottle to prevent degradation by UV exposure. It is not recommended to use a clear glass bottle for storage
Shelf life	12 months from purchase if stored appropriately

## How to use FluoSurf

Neat FluoSurf must be solved in fluorinated oil (HFE 7500 or FC 40) during one night before use. FluoSurf can be delivered at 2 w/w-% or 5 w/w-% in HFE 7500 or FC 40 as ready to use formulations. If necessary, fluorinated solutions can be filtrated using PTFE syringe tip filters (repeated filtrations may reduce product concentration).

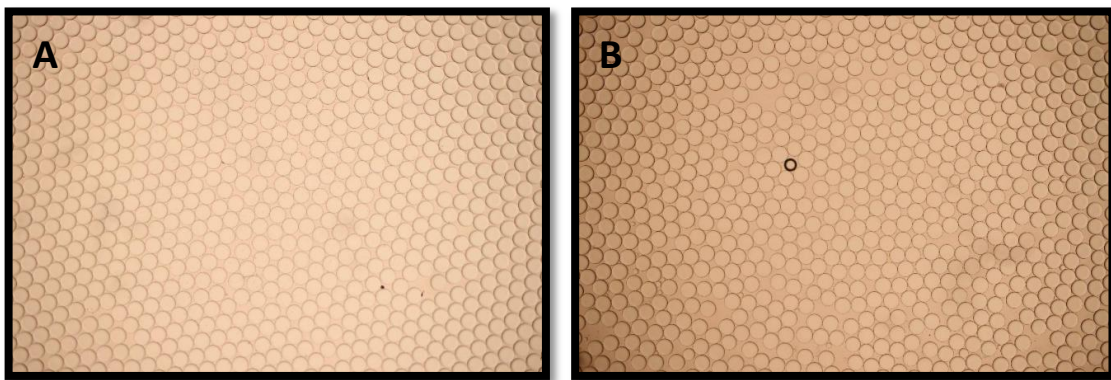
At high or fluctuating temperatures (dPCR), the 4 w/w-% concentration is recommended in order to improve droplet stability.

It is advised to collect water in fluorinated oil emulsion into a plastic container. Hydrophilic surface of glass containers can disrupt droplet stability.

## Applications of FluoSurf

Applications of FluoSurf (non-exhaustive list):

- DNA amplification (dPCR)
- Single cell analysis
- Enzyme or protein screening
- Isolation of bacteria



**Figure 3: Optical microscope pictures of water in oil emulsion using FluoSurf before (A) and after (B) thermocycling. The difference of coefficient of variation before and after is less than 4%. Thermocycling: 30 cycles 95°C during 30s, 55°C during 1 min, 72°C during 5 min, 40°C during 1 min.**