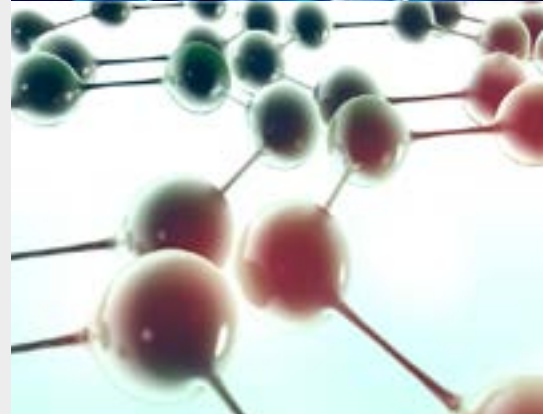


STOPPED FLOW



# $\mu$ SFM.

Micro-Volume Stopped-Flow  
Make every drop count



# 100 $\mu\text{l}$ is all you need ... for 10 shots !



The result of decades of research and development,  $\mu\text{SFM}$ , BioLogic's latest stopped-flow mixing system has been specifically designed to meet the need of micro-volume operations in rapid-kinetics experiments.

Samples, especially proteins, are often researchers' most valuable assets. Their scientific, financial and development/production cost makes them precious scientific commodities.

So, in rapid kinetics experiments, every drop counts.

## More experiments - fewer samples

$\mu\text{SFM}$  joins our widely recognized micro-volume quench-flow instrument (QFM-4000) and strengthens BioLogic's position as the micro-volume leader for rapid kinetics studies.

The  $\mu\text{SFM}$  is a two-syringe stopped-flow system. An independent stepping-motor drives each syringe, giving users total control of mixing ratios ranging from 1:1 to 1:9.

A unique design utilizing high-precision motors and micro-volume glass syringes simplifies the mixing process and manages sample use with pinpoint accuracy; ensuring only a few  $\mu\text{l}$  of precious sample are needed during each experiment.

## Direct, one-stage process

### The most efficient instrument on the market

$\mu\text{SFM}$  is so effective because it reduces both priming volumes and volumes per experiment.

The priming volume is the minimum sample volume needed to load into the system to start collecting data. The  $\mu\text{SFM}$  has been designed to position driving syringes as close as possible to the mixer – minimizing priming volumes, so that samples are not replaced needlessly.

This, in combination with a one-step process where samples are directly transferred from storage vials to the stopped-flow driving syringe, makes the  $\mu\text{SFM}$  the most efficient stopped-flow on the market.

With a 100  $\mu\text{l}$  stock users have enough solution for 10 replicates, with 200  $\mu\text{l}$  of stock 23 usable shots are possible!



X-ray head for  $\mu\text{SFM}$

## Easy coupling

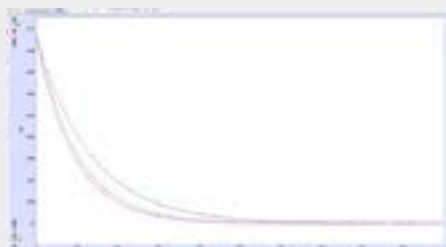
The  $\mu$ SFM observation head is built around a standardized design for all our stopped-flow models and is compatible with all BioLogic spectrometers. The BioLogic MOS-200 and MOS-200/M are perfect for all rapid reactions as they offer absorbance, fluorescence and 90° light scattering capabilities. The observation head is connected to the monochromator using a fiber optics cable and the photomultiplier tube is attached directly to the observation head. External coupling options enable compatibility with a wide range of other systems. A microvolume X-ray head is also available as an option for capillaries.



## No compromise on dead time

Independent stepping motors give users full control over flow velocity allowing dead times of 1 ms to be obtained. The measurement of short dead times is enhanced by a highly responsive stop mechanism and a pre-trigger. The  $\mu$ SFM is the ideal instrument for single mixing experiments with moderate rate constant (below 150 s<sup>-1</sup>).

## Concentration dependence studies



Concentration dependence studies can be carried out easily by loading different concentrations of reagents in the second syringe. After a few replicates this syringe can then be safely removed from the  $\mu$ SFM body without interference. There is no cross contamination nor any need to re-prime the flow circuit. In the example below, with 300  $\mu$ l of sample, we demonstrate how users can test three concentrations obtaining eight replicates for each concentration, resulting in 24 total experiments.

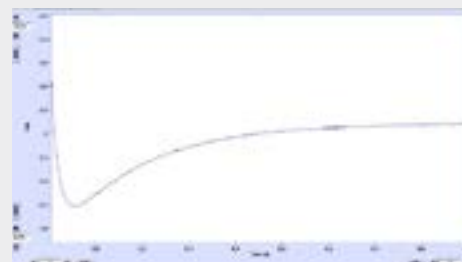
## Fill it. Forget it.

There is no need to remove the syringe every two measurements as with other rival systems, resulting in sample loss for priming. The  $\mu$ SFM's unique design makes it the perfect instrument for multiple experiments and automation.



## Refolding/unfolding studies

The  $\mu$ SFM can achieve a 1:9 mixing ratio. Refolding/unfolding experiments are even possible for reactions between 5–6s. With only 50  $\mu$ l of stock solution the user has enough material to prime the instrument and collect nine valuable shots. Only 3  $\mu$ l of precious sample is used for each shot and without compromising sensitivity.



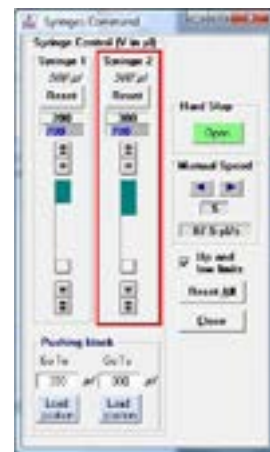
Lysozyme refolding starting from 50  $\mu$ l stock

## User-friendly software

Programming a mixing sequence is highly intuitive, so new users are operational in minutes.

Bio-Kine software is included with the  $\mu$ SFM for system control, data collection, and analysis. This software makes sample management simple. The user sets the mixing ratio, the sample volume and the injection flow-rate. Color-coded window displays calculated values and alert the user to out of range conditions. The estimated dead time is also indicated in the mixing sequence window.

Handling glass syringes and small volumes is made easier with Bio-Kine's automatic loading functions. The user first indicates the sample quantity loaded manually in the syringe. The  $\mu$ SFM pushing blocks then move to preset positioning points where high-precision adjustments can be made from the driving unit. This fast and simple process ensures accurate sample management and minimum wastage.



## Temperature control

The driving syringes, the mixer and the cuvette are temperature controlled by a water bath circulator. They are connected to the same circuit to avoid temperature gradients created when different circuits are used for syringes and cuvettes. The syringes can be removed from the  $\mu$ SFM without stopping the water bath circulator.

This allows the user to reload the syringe within a few seconds, reinstall them and continue a series of experiments. An optional temperature probe is available for installation on the cuvette. It provides temperature readout in Bio-Kine software with 0.1 °C precision.

### SPECIFICATIONS

Drive mechanism: independent stepping motors	
Number of syringes	2
Syringe type	Glass, 500 $\mu$ l
Number of mixers	1
Mixer type	Micro Berger Ball
Stop mechanism	Electrovalve
Sample Consumption	
Mixing ratio	Fully variable from 1:1 to 1:9
Maximum flow rate	1.8 ml/s
Priming volume	24 $\mu$ l
Minimum volume per shot (total)	24 $\mu$ l
Minimum injection volume	3 $\mu$ l
Observation head	
Number of detection windows	3
Cuvette light path	0.8 mm
Cuvette volume	2-3 $\mu$ l
Minimum dead time	1 ms
Material	PEEK, FFKM (full solvent compatibility)

Synchronization with detection	
Trigger	fully programmable; 5V TTL trigger in/ out available
Optical coupling	fiber optics or direct attachment
Temperature control	
Temperature range	0 to +50 °C
Temperature control	Water bath circulator (optional)
Temperature probe	Optional PT100 allows direct reading of temperature in Bio-Kine
General	
Dimensions	200 x140 x 640 mm
Weight	9 kg
Communication	USB
Power	110 V - 220 V

#### Note

Bio-Kine software and a USB connected hardware interface is included with the  $\mu$ SFM. A PC is required for controlling the  $\mu$ SFM (Windows XP, 7, 8 or 10).

[www.biologic.net](http://www.biologic.net)

**Shaping the future.  
Together.**