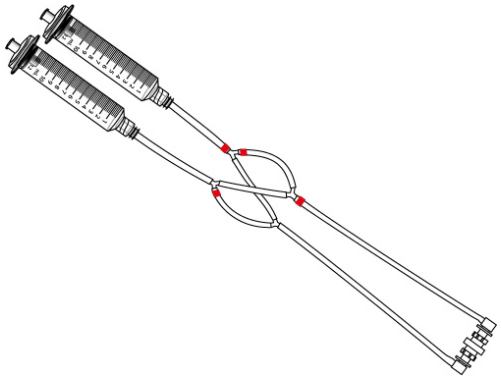
Perfusion Set

Instruction Manual



The Perfusion Set is part of the ibidi Pump System consisting of two reservoirs, which contain the cell culture medium, and the tubing leading to the channel slide. The Perfusion Set is mounted onto the Fluidic Unit, which enables the ibidi Pump System to generate flow inside the channel.

The Perfusion Set exists in multiple versions with varying volumes and tubing length to allow for a wide range of shear stresses and flow rates. The standard syringe reservoir size is 10 ml. However, the system can also be equipped with 2 ml and 50 ml syringe reservoirs.

Material

The Perfusion Set consists of silicone tubing, polypropylene adapters, sterile air filters, and syringe reservoirs. The syringes contain no natural rubber and are latex-free.
The lifespan of the Perfusion Set's silicone tubing is dependent on the number of switching events. The material fatigues after 500 000-1 000 000 pinching cycles. To prolong the lifespan of the tubing, change the position of the tubing inside the valve slightly.

Note!
We do not recommend reutilization of the Perfusion Set as substances may adhere to the surface of the tubing and repeated sterilization and utilization of the tubing may lead to leakages.

All parts of the Perfusion Sets can be cleaned and sterilized by different techniques. Please see the following table for details. Syringes, filters, and slides are not autoclavable and must be removed before autoclaving or replaced with new parts. Replacement reservoirs (Filter/Reservoir Sets: #10971, #10972, #10974) are available for purchase. Best results are achieved when a new Perfusion Set is used for every experiment.

Sterilization Compatibilities		
	Autocl.	Ethanol
Filters	no	yes
Syringe reservoirs	no	yes
Tubing	yes	yes
PP adapters	yes	yes
µ-Slide	no	yes

Geometry

The Perfusion Set is manufactured in multiple versions. There are three different inner diameters of the tubing (1.6 mm, 0.8 mm and 0.5 mm), varying tube lengths (15 cm, 50 cm, and 100 cm, respectively), and three reservoir sizes (10 ml, 2 ml and 50 ml). The possible combinations that are available (marked with a color code) are listed in the following tables:

Perfusion Sets with ID 1.6 mm			
	Red	Yell./Green	Orange
Syringe size	10 ml	10 ml	10 ml
Tubing ID	1.6 mm	1.6 mm	1.6 mm
Tubing length	15 cm	50 cm	100 cm
Total volume	12.6 ml	13.3 ml	14.3 m
Dead volume*	0.3 ml	1.0 ml	2.0 ml

*Dead volume of the tubing without slide.

Perfusion Sets with ID 0.8 mm			
	Blue	White	Grey
Syringe size	10 ml	10 ml	10 ml
Tubing ID	0.8 mm	0.8 mm	0.8 mm
Tubing length	15 cm	50 cm	100 cm
Total volume	12.4 ml	12.6 ml	12.9 ml
Dead volume*	0.075 ml	0.25 ml	0.52 ml

*Dead volume of the tubing without slide.

Perfusion Sets with ID 0.5 mm			
	Yellow	Black	Brown
Syringe size	2 ml	2 ml	2 ml
Tubing ID	0.5 mm	0.5 mm	0.5 mm
Tubing length	15 cm	50 cm	100 cm
Total volume	2.5 ml	2.6 ml	2.7 ml
Dead volume*	0.03 ml	0.1 ml	0.2 ml

*Dead volume of the tubing without slide.

It is possible to enlarge the medium volume by using 50 ml reservoirs (#10974). To mount the 50 ml syringes onto the Fluidic Unit, a special Reservoir Holder is needed (#10978). A combination with the 1.6 mm inner diameter tubing is recommended.

Shipping and Storage

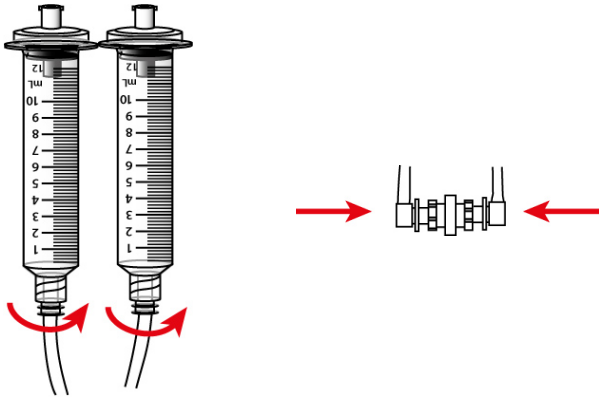
The Perfusion Sets are sterilized and welded in a gas-permeable packaging.

Shipping conditions	Ambient
Storage conditions	RT (15–25 °C)
Shelf life	36 months

Handling

The Perfusion Set comes in sterile packaging. To degas the silicone tubing and plastic parts, leave the Perfusion Set in the packaging and place it in the incubator overnight.

When taking out the Perfusion Set of the packaging, place the Fluidic Unit into the laminar flow hood. Insert the reservoirs into the holder on the Fluidic Unit and check the tightness of the adapters. It is recommended to secure the adapters connecting the reservoirs to the tubing and the two Elbow Luer Connectors in the Female Luer Coupler.



Check the tightness of the connections!

Flow Assays

The Perfusion Sets are designed to perform flow assays in combination with the ibidi Pump System and the ibidi channel slides.
The Perfusion Set and Slide Selection Guide shows the possible combinations of components according to shear stress or flow rate ranges.
Find more details on how to use the Perfusion Sets in

- the ibidi Pump System instruction manual
- the Application Note 13 “Endothelial Cells under Perfusion”
- and the Application Note 11 “Shear Stress and Shear Rates”

Always perform a flow calibration before starting the experiment, as explained in the Pump System instruction manual!

Due to varying inner diameters and tube lengths, specific flow rate and shear stress ranges can be reached, according to the Perfusion Set and Slide selection. More information on the possible flow rates and according shear stress can be found in the ibidi Pump System instruction manual