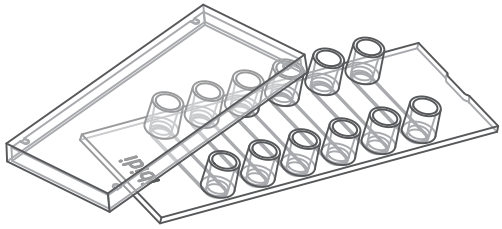
µ-Slide VI $^{0.4}$ Bioinert

Instruction Manual



The ibidi labware comprises a variety of µ-Slides, µ-Dishes, and µ-Plates, which have all been designed for high-end microscopic analysis of fixed or living cells. The high optical quality of the ibidi Polymer Coverslip is similar to that of glass, enabling a variety of recommended microscopy techniques with uncompromised resolution and choice of wavelength.
The surface of the µ-Slide VI $^{0.4}$ Bioinert is completely non-adherent and allows no binding of any biomolecule, even in long-term experiments. This makes Bioinert ideal for the culture and high-resolution imaging of suspension cells and cell aggregates, such as spheroids, organoids, and embryoid bodies.

This document applies to the following product:

80600	**µ-Slide VI $^{0.4}$ Bioinert**

Material

The µ-Slide VI $^{0.4}$ Bioinert is made of a polymer that has the highest optical quality. The ibidi Polymer Coverslip bottom exhibits extremely low birefringence and autofluorescence, similar to that of glass. It is not possible to detach the bottom from the upper part. The slide is intended for one-time use and is not autoclavable, since it is only temperature-stable up to 80 °C/175 °F. Please note that gas exchange between the medium and the incubator's atmosphere occurs partially through the polymer coverslip, which should not be covered.

Optical Properties of Polymer Coverslip	
Refractive index (589 nm)	1.52
Abbe number	56
Thickness	No. 1.5 (180 µm)
Material	Polymer

WARNING – The ibidi Polymer Coverslip is compatible with certain types of immersion oil only. A list of suitable oils can be found in the Section "Immersion Oil".

Shipping and Storage

This product is sterilized and sealed in a gas-permeable packaging. The shelf life under proper storage conditions (in a dry place, no direct sunlight) is outlined in the following table.

Conditions	
Shipping conditions	Ambient
Storage conditions	RT (15–25 °C), dry place (relative humidity <50%)

Shelf Life	
Bioinert	36 months

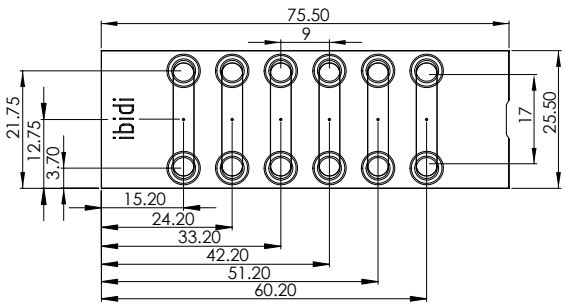
Surface

The Bioinert surface is a thin hydrogel layer that is covalently attached to the ibidi Polymer Coverslip. It allows no adsorption, coating, or binding of proteins, antibodies, enzymes, and other biomolecules. Therefore, the Bioinert technology provides a stable passivation in cell-based assays for several days or even weeks. The hydrophilic Bioinert surface hinders any protein attachment, thus inhibiting subsequent cell attachment. The Bioinert surface is not biodegradable by cells, allowing long-term assays with suspension cells and cell aggregates, such as spheroids, organoids and embryoid bodies.

Geometry

The µ-Slide VI 0.4 Bioinert provides a standard slide format according to ISO 8037/1. The 9 mm lateral adapter-to-adapter distance (as in 96 well plates) enables the use of multichannel pipettes.

Specifications of the µ-Slide VI 0.4	
Outer dimensions (w × l)	25.5 × 75.5 mm²
Adapters	Female Luer
Number of channels	6
Channel height	0.4 mm
Channel length	17 mm
Channel width	3.8 mm
Volume of each channel	30 µl
Volume of each adapter	60 µl
Height with/without lid	8.7 / 7.5 mm
Growth area per channel	0.6 cm²
Coating area per channel	1.2 cm²
Bottom	ibidi Polymer Coverslip
Bioinert surface thickness	200 nm
Bioinert surface material	Polyol-based hydrogel
Protein coatings	Not possible



TIP – The day before seeding the cells, we recommend placing the cell medium, the slide, and the tubing into the incubator for equilibration. This will prevent the liquid inside the channel from forming air bubbles during the incubation time.
Quick dispensing of the cell suspension helps avoid trapped air bubbles and leads to maximal homogeneity of cell distribution.

Seeding Cells

Without a surface modification, Bioinert does not support direct cell adherence. Depending on your application, the number of cells or cell aggregates might differ. Follow these steps for a general cell application protocol:

1. Trypsinize and count cells as usual. Dilute the cell suspension to the desired concentration. Depending on your cell type, we recommend a 3–7 × 10^5 cells/ml suspension.
2. Add 30 µl cell suspension directly into each channel. Quick dispensing helps to avoid trapped air bubbles.
3. Cover the slide with the supplied lid and incubate as usual (e.g., at 37 °C and 5% CO_2).
4. Following cell stabilization, slowly fill each reservoir with 60 µl medium.

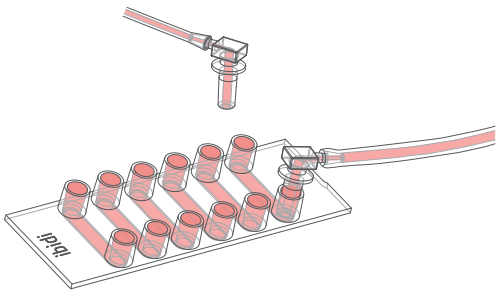
TIP – Trapped air bubbles can be removed from the channel by inclining the slide and knocking at one edge.

CAUTION – Ensure incubator shelves and microscope stages are level, as single cells or clusters may gradually shift to one side on uneven surfaces. Please also avoid evaporation and temperature changes. Both will lead to convectional flow.

Connecting Tubing for Perfusion

The µ-Slide VI 0.4 Bioinert is compatible with the ibidi Pump System as well as other pump setups for experiments in which cells or spheroids are cultured in suspension and exposed to flow. To perform such experiments, please follow the protocol outlined below.

1. Fill both Luer ports of the designated flow channel completely with cell-free medium. This ensures air bubble-free connection of the tubing.
2. Prepare the perfusion system: Fill the tubing completely with medium, then pinch it off using a screw clamp or hose clip.
3. Connect the male Luer ends of the clamped tubing to the Luer ports one at a time, ensuring no air is trapped. Remove any excess medium with a tissue.



4. Open the clamped tubing and conduct your perfusion experiment.

For a serial connection of several µ-Slides VI 0.4 Bioinert with each other, please refer to Application Note 31: Serial Connection of µ-Slide VI 0.4 Channels for Flow Experiments.

Shear Stress Calculations

Detailed information about flow rates, shear stress, and shear rates is provided in Application Note 11: Shear Stress and Shear Rates for ibidi µ-Slides.

To calculate the shear stress (τ) in µ-Slide VI 0.4 Bioinert, insert the flow rate (Φ) and the dynamic viscosity (η) in the formula provided below:

$$\tau = \eta \cdot 176.1 \cdot \Phi$$

For simplicity, the calculations include conversions of units (not shown). Please insert the values in the unit definitions given below:

Shear stress	$\tau \left[\frac{dyn}{cm^2}\right]$
Dynamical viscosity	$\eta \left[\frac{dyn \cdot s}{cm^2}\right]$
Flow rate	$\Phi \left[\frac{ml}{min}\right]$

Microscopy

To image your cells, no special preparations are necessary. Living or fixed cells can be directly observed, preferably on an inverted microscope. The bottom cannot be removed. Due to the thin bottom, high-resolution microscopy is possible.

Without disturbing effects such as convection, evaporation, and fast stage accelerations, there is no need to stabilize your cell samples on the Bioinert surface. Minimize convectional flow caused by evaporation or temperature gradients. Even without cell attachment, single cells, spheroids, or other clusters remain stable on the Bioinert surface.

Chemical Compatibility

The following table provides some basic information on the chemical and solvent compatibility of the µ-Slide VI 0.4 Bioinert. For a full list of compatible solvents and more information on chemical compatibility, visit ibidi.com/chemicals.

Chemical / Solvent	Compatibility
Methanol	Yes
Ethanol	Yes
Formaldehyde	Yes
Acetone	Yes, without lid
Mineral oil	No
Silicone oil	Yes
Immersion oil	See Section “Immersion Oil”

Immersion Oil

WARNING – When using oil immersion objectives with the ibidi Polymer Coverslip, use only the immersion oils specified in the table below. The use of any non-recommended oil could damage the ibidi Polymer Coverslip. The resulting leakage may harm objectives and microscope components. All immersion oils that are not listed in the table below should be considered non-compatible.

Company	Product	Ordering No.	Lot Number	Test Date
ibidi	ibidi Immersion Oil 2	50102	24-07-04	07/2024
Cargille	Type A	16482	100592	01/2017
Cargille	Type HF	16245	92192	01/2017
Carl Roth	Immersion oil	X899.1	414220338	01/2017
Leica	Immersion Liquid	11513859	n.a.	03/2023
Leica	Immersion Liquid Type G	11513910	n.a.	04/2024
Nikon	Immersion Oil F2 30cc	MXA22192	n.a.	01/2020
Nikon	Silicone Immersion Oil 30cc	MXA22179	20191101	01/2020
Olympus	Silicone Immersion Oil	SIL300CS-30CC	N4190800	01/2017
Zeiss	Immersol 518 F	444960-0000	220211	03/2023
Zeiss	Immersol 518 F (30 °C)	444970-9010	220816	03/2023
Zeiss	Immersol 518 F (37 °C)	444970-9000	220302	03/2023
Zeiss	Immersol W 2010	444969-0000	101122	04/2012
Zeiss	Immersol Sil 406	444971-9000	80730	03/2023
Zeiss	Immersol G	462959-9901	211117	03/2023

For research use only!

Further information can be found at ibidi.com. For questions and suggestions, please contact us by e-mail at info@ibidi.com or by telephone at +49 (0)89/520 4617 0.