

Advanced in vitro exposure systems

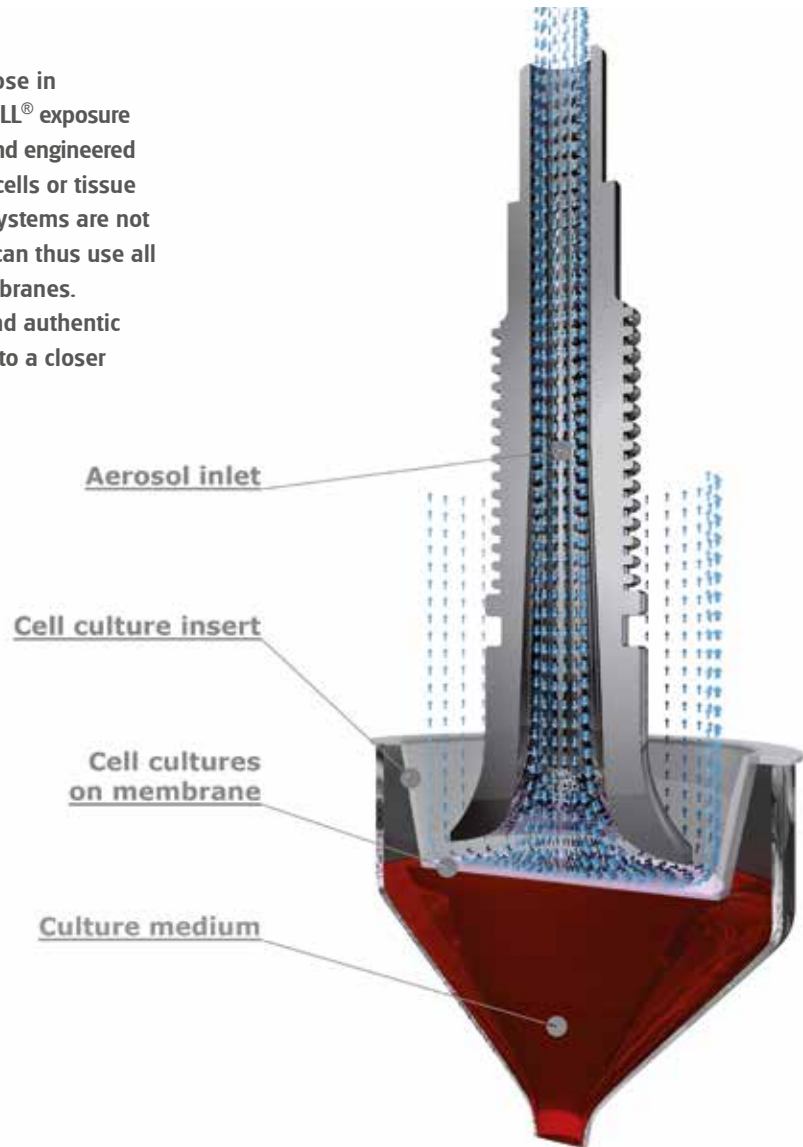
VITROCELL® 6/48



VITROCELL[®] Exposure Systems for Inhalation Toxicology

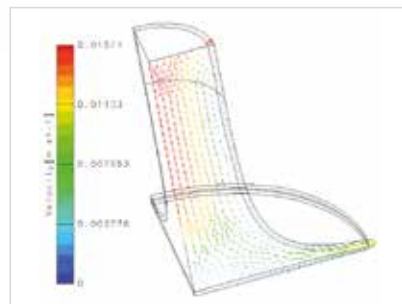
Direct Exposure Technology at Air/Liquid Interface

In response to the scientific need to expose in physiologically relevant conditions, VITROCELL[®] exposure modules have been specifically designed and engineered to enable direct exposure of mammalian cells or tissue at the air/liquid interface where the cell systems are not covered with culture media. Researchers can thus use all cell types cultivated on microporous membranes. This approach allows for more credible and authentic results than by submerged exposure due to a closer replication of the human physiology.



The advantages:

- No losses
- No dissolution
- No reaction of constituents with culture media
- High sensitivity



Optimized
flow dynamics



VITROCELL® EXPOSURE AT THE AIR/LIQUID INTERFACE

Submerged Cultivation and Exposure in Incubator

- A** Media above cells
- B** Cells on membrane
- C** Media below cells

Interaction of test components with culture media

Low sensitivity

Suspension Cultivation and Exposure in Incubator

- A** Cells in media

Interaction of test components with culture media

Low sensitivity

Air / Liquid Cultivation and Exposure in Exposure Module

- A** Direct and controlled exposure of test atmosphere to cells
- B** Cells on membrane
- C** Media below cells

No losses
No reaction of principle components with culture media

High sensitivity of system

The exposure of mammalian cells or tissues to airborne substances is frequently performed under submerged conditions. In doing so, the test substances are dosed into the culture media. This procedure results in an undesired interaction of the formerly airborne substances with the media, causing limitations for authentic analysis. Therefore VITROCELL® recommends the air/liquid interface exposure technology.

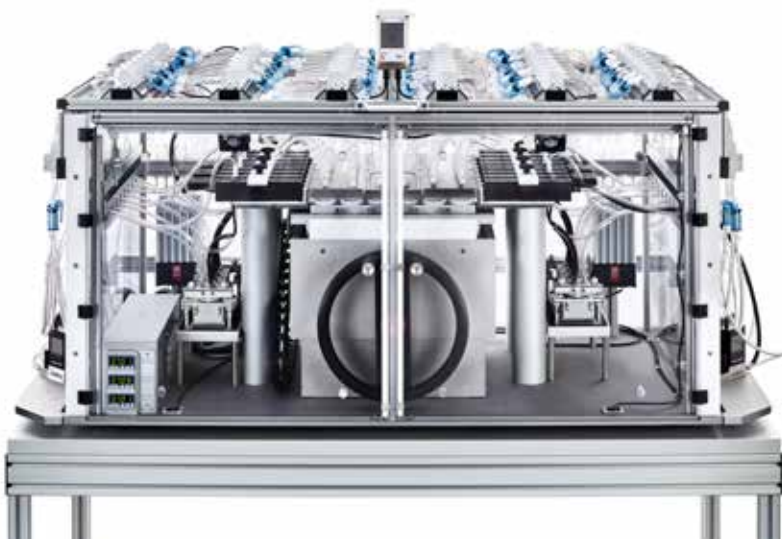


Higher Throughput

**7 doses @ 6 replicates
1 control @ 6 replicates**

VITROCELL® 6/48 Climatic Chamber Exposure Module

For 48 cell culture inserts (6-well size)



Easy access to all components

The VITROCELL® 6/48 module system has been specifically designed and engineered to facilitate the research of mammalian cell cultures in direct exposure to airborne substances such as gases, complex mixtures, nanoparticles and fibers. The system authentically simulates the conditions of human physiological exposure.

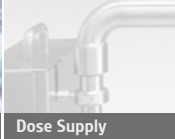
Only one system is required: 7 dilutions with 6 inserts are used for exposure to the substances and 6 inserts in the same system for clean air control.

The cells are exposed at the air/liquid interface on 48 cell culture inserts using low flow rates of the aerosol. A complete dose / response profile can be obtained in one experiment.

After exposure, the cells are further processed to measure a wide range of endpoints, e. g. cytotoxicity, genotoxicity, proliferation, cellular and oxidative stress as well as inflammation (see also VITROCELL® assay guide).



Heating Systems for base module and climatic chamber to avoid effects of aerosol condensation.



Base module

The base module has been designed for 48 cell culture inserts.

The media is supplied individually to each well compartment.

Temperature is electronically controlled at 37° C (99° F) by means of a heated base plate. Therefore, an additional incubator is not required while using this module. The base module is made of aluminum with



Base module

media compartments of stainless steel. It is autoclavable at 121° C (250° F) for 20 min.

This module is renowned in scientific circles for its reliability and durability.



Cell culture insert (6-well size)

Available adaptor set for:

- 12-well sized inserts
- Snapwell® inserts
- 24-well sized inserts

Aerosol exposure top

The docking station with special sealing and connection mechanisms guarantee a hermetic connection of the base module with the aerosol exposure top.

The aerosol inlet-stream flows through specifically shaped inlets. They are available in stainless steel or stainless steel with unique VITROGLIDE surface treatment for lowest adhesion results. The stainless steel / VITROGLIDE

inlets are specifically designed for aerosols containing nanoparticles.

The aerosol inlets are connected to the distribution or dilution systems. Extraction from the module takes place via small holes using a controlled vacuum flow. VITROCELL® calibration valves, which are connected to a vacuum pump, control flow rates

effectively. The aerosol exposure top features an in/outlet for heating the water circuit, ensuring corresponding temperatures with the base module. It is made of high-quality anodized aluminum and titanium.



Docking station



Drawer and locking mechanism

Features

- Suitable for **COSTAR®**, **FALCON®** and **ThinCert®** 6-well sized cell culture inserts
- Base module compartments made of stainless steel for maximum durability
- Hyperboloid geometry of inlets for optimized particle deposition and distribution
- Available inlet materials: stainless steel, stainless steel with unique VITROGLIDE surface treatment
- Heating base plate with electronic control
- An additional incubator is not required while using this module
- Option: VITROCELL® AMES 6/48 Plus with 7th row for dosimetry (for liquid trapping or microbalance)
- Autoclavable at 121° C (250° F)

Refined detail solutions



Vacuum quick connector strips for fast exchange of exposure tops with alternative inlet sizes



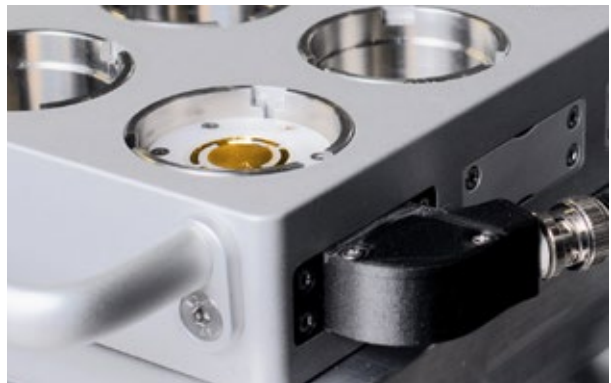
Heavy duty column guided lifting-closing mechanism for precise dosing

VITROCELL® 48 PLUS with 7th row for liquid trapping or microbalance

For Dosimetry
7 doses @ 7 replicates
1 control @ 7 replicates



Exposure module with 7th row on drawer



Optional microbalance sensor in 7th position

Technical Data

Dimensions:	1 280 x 750 x 800 mm (LxWxH), Height opened: 1 115 mm
Weight:	200 kg
Voltage:	110–240 V / 50 Hz
Rating:	1 200 W (max)
Fuse:	2 x 6.3 A

About VITROCELL®

VITROCELL® exclusively concentrates on the developing, producing, installing, training and servicing of advanced *in vitro* exposure systems.

The VITROCELL® Systems' team is driven by their vision for new in-vitro standards through state-of-the-art technology, highly qualified workmanship and absolute client dedication. VITROCELL® has successfully collaborated with clients from leading research institutes, contract research organizations, regulatory authorities or industrial laboratories across the world. Working with our team experts, all modules have been tailored to create durable and complete turnkey-systems for *in vitro* inhalation toxicology. Gases, environmental atmospheres, nano particles and complex mixtures are analyzed on lung cells at the air/liquid interface using these systems. VITROCELL® technologies are also applicable to solutions for skin research.

Over a decade of devotion to research in this specific field has given our team of design & precision manufacturing specialists the opportunity to mentor highly diversified and complex projects **from conception to completion**. We strive to become a constructive member of each research team, providing support when it is needed, advice when it is required and modules of the highest quality, which are even polished by hand before leaving here to be integrated into your workspace. Every piece of our German engineered equipment is manufactured to the highest of standards – yours.

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