

# Advanced in vitro exposure systems

VITROCELL® 24/48

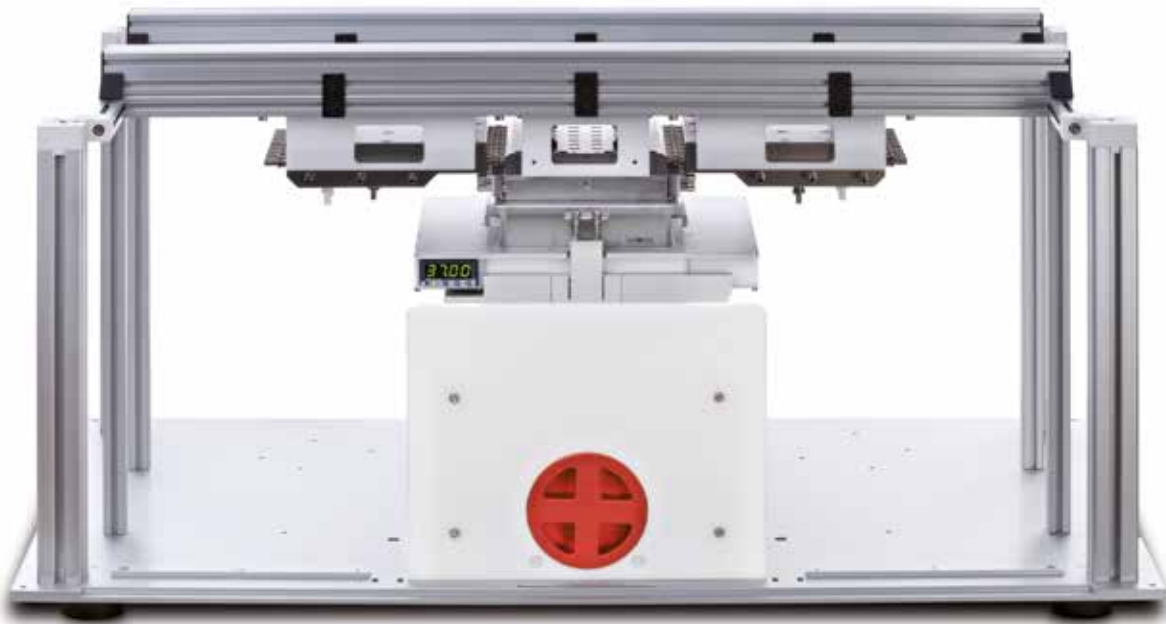


**Higher Throughput**

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

## **VITROCELL® 24/48 Exposure Module**

**For 48 cell culture inserts (24-well size)**



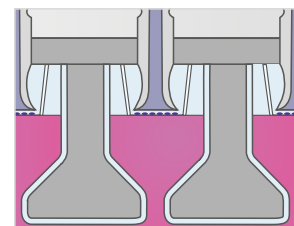
**VITROCELL® 24/48 incl. rack, locking device and dilution systems**

The VITROCELL® 24/48 module system has been specifically designed and engineered to facilitate the research of human 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.

Normally only one system is required: 7 dilutions with 6 inserts each are used for exposure to the substances and 6 inserts in the same system for clean air control. Each dilution represents a different dose concentration, so that a complete dose/response profile can be obtained in one experiment.

The cells are exposed at the air/liquid interface on 48 cell culture inserts or on a HTS plate using low flow rates of the aerosol.

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).

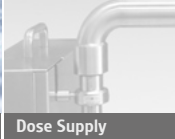


### **Culture media supply**

The media is supplied to the module by gravimetric method or syringe.



Exposure Systems



Dose Supply



Dilution



Racks & Carts



Dose Monitoring

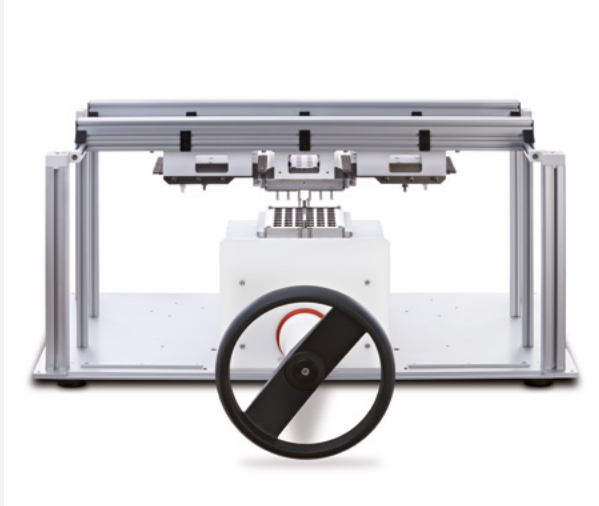


Skin Exposure



Auxiliary Equipment

## Base module with unique locking device



The base module is made of electropolished stainless steel. Temperature can be programmed individually.



Cell culture inserts (24-well size)



The base module is made of electropolished stainless steel and autoclavable at 20 min./121° C (250° F). This module is renowned in scientific circles for its reliability and durability.

## Aerosol exposure top



Special sealing and connection mechanisms guarantee a hermetic connection of the base module with the aerosol exposure top.

The aerosol inlets are already connected to

the integrated distribution system. Evacuation from the module takes place via small holes using an individually controlled vacuum flow for each insert.

The flow rate is controlled by the VITROCELL® calibration valves which are connected to a vacuum pump. The aerosol exposure top with the integrated aerosol distribution system is made

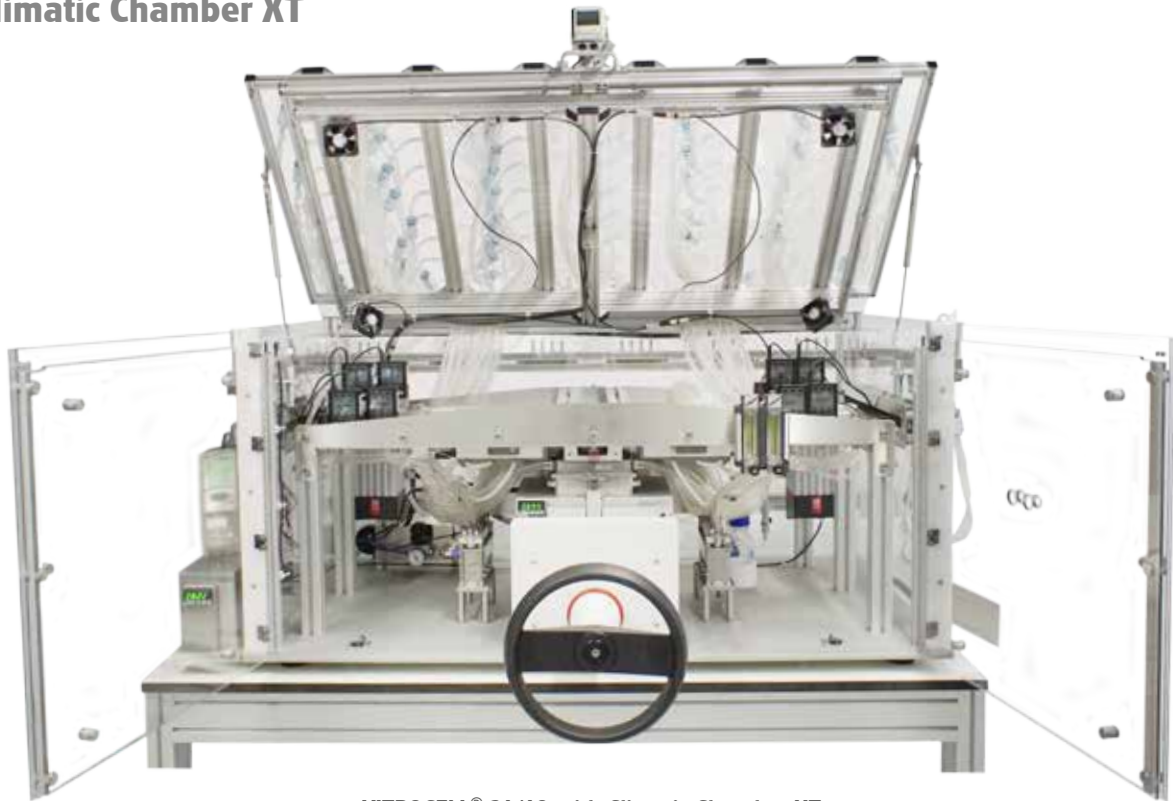
of stainless steel with VITROGLIDE surface treatment.

The dynamic dilution system for up to 8 dilutions is part of the delivery.



# VITROCELL® 24/48

## Climatic Chamber XT



VITROCELL® 24/48 with Climatic Chamber XT

The new generation of Climatic Chambers is enlarged to accommodate all required components for the operation of the VITROCELL® 24/48 System.

More space facilitates the handling of dosimetry tools inside the chamber.

The extended version features an integrated humidification system with pre-heating of dilution air. The flow controllers are moved to the inside of the chamber for constant temperature and increased humidity output.

## Features

- Supplied with dynamic double-jet dilution system for 8 dilutions with 6 replicates
- 48 media compartments for **COSTAR®**, **FALCON®** and **ThinCert®** inserts in 24-well size
- Base module made of electropolished stainless steel for extreme durability
- Integrated aerosol distribution system made of stainless steel/VITROGLIDE surface
- Single supply to each cell culture membrane
- Base module and aerosol exposure top are autoclavable
- Integrated, sensor-controlled heating plate
- Optional climatic chamber for liquid aerosols
- Integrated flow controllers
- Space for Humidification Station



Integrated supports for flow controllers

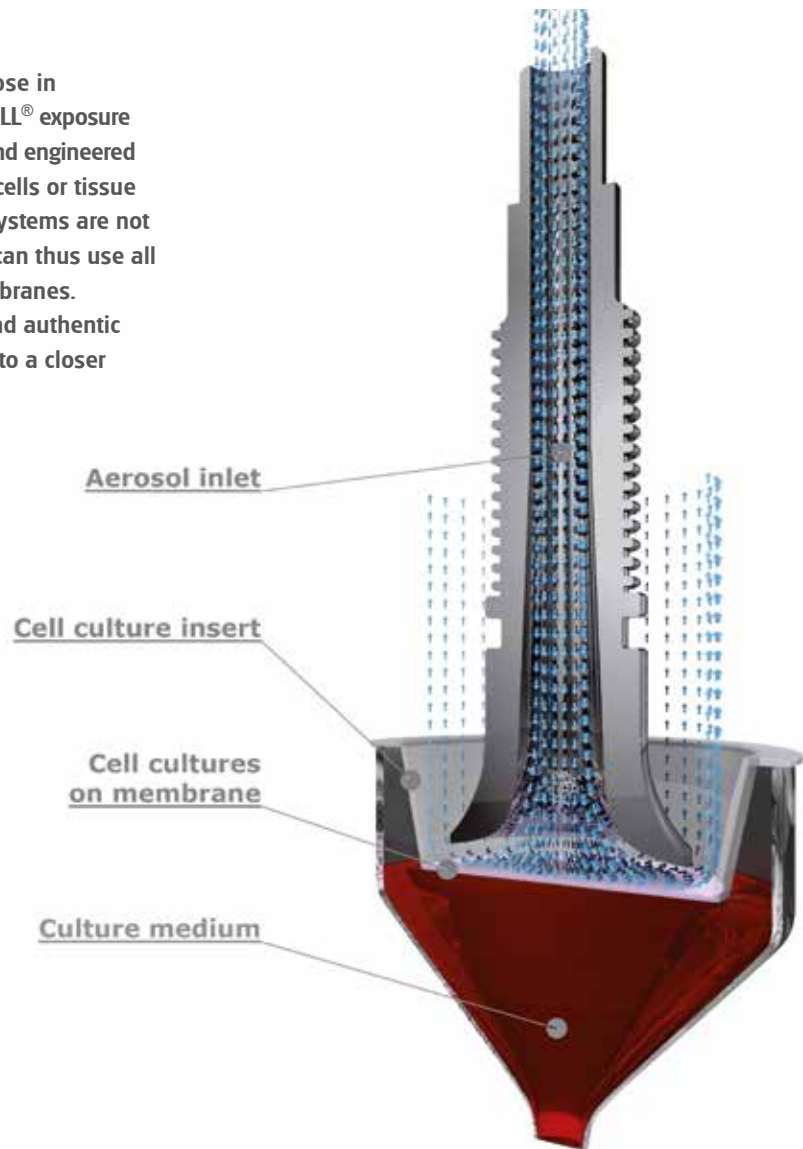


Holders for oscillators of microbalances

# VITROCELL® Exposure Systems for Inhalation Toxicology

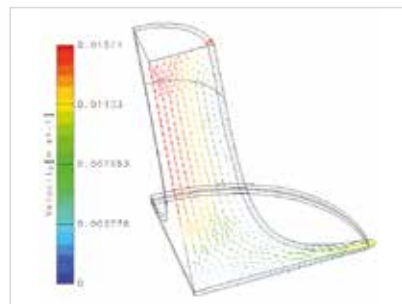
## Direct Exposure Technology at Air/Liquid Interface

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.



## 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.

For more information  
please scan the QR-Code:



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