

Advanced in vitro exposure systems



VITROCELL® PowderX

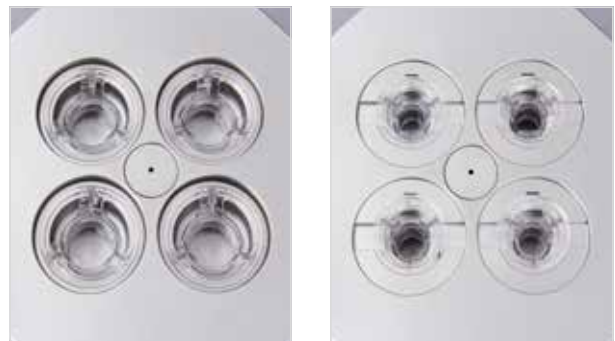
For cell culture exposure to smallest quantities of dry powders

Touchscreen operation enables a step-by-step user guidance through the entire process



PowderX allows for aerosolisation of small quantities of dry powders and particle deposition on cells cultured on 12- or 24-well sized inserts.

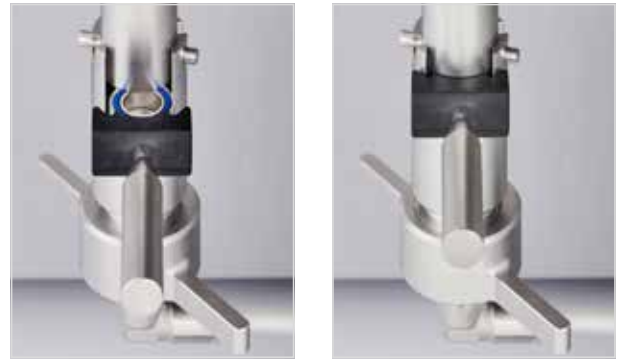
The system features biological barrier integration and continuous sampling from the basolateral compartment.



Base module houses 12- (left) or 24-well sized inserts (right). All commercial brands are supported.

Small powder samples of 5–100 mg are positioned in the quick-lock loading system. Subsequent aerosolisation of the powder takes place under high pressure by a unique jet system. The resulting shear forces facilitate deagglomeration for homogeneous dispersion into the expansion chamber. Final deposition takes place via gravimetric settling.

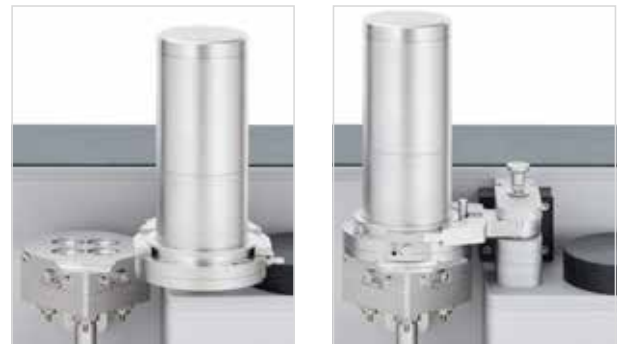
The height of the expansion chamber can be varied in three different steps according to the behaviour and properties of the powder sample. For handling of the inserts the expansion chamber can be separated effort-free from the exposure module.



Quick-lock loading system open (left) and closed (right).

Working Principle

1. Powder sample is placed in quick-lock loading system.
2. Expansion chamber and base module are tightly sealed by touchscreen operation.
3. Powder sample is aerosolized under high pressure to break up agglomerates for homogeneous dispersion in the expansion chamber.
4. Powder sample settles on cell cultures.



Medium size expansion chamber – standby (left) and sealed (right).



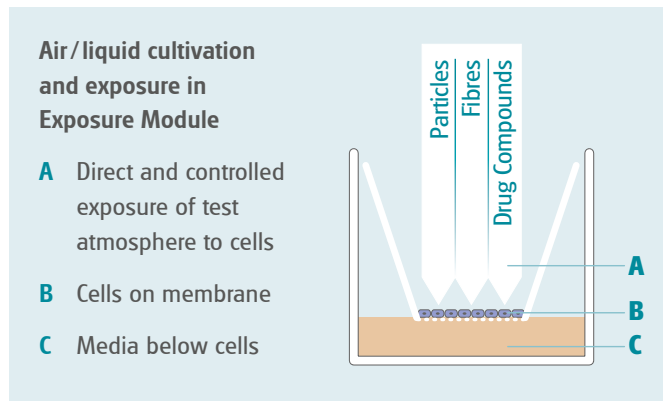
The base module is prepared for continuous or time-based sampling from the media compartment.

Key Features:

- Easy handling
- Only small quantities of powder needed (5–100 mg)
- No external airflow required
- Exposure time < 30 minutes
- Optional continuous media supply or media sampling
- Optional magnetic stirring for media compartment
- Intuitive user experience with touchscreen operation

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 medium.

Researchers can thus use all cell types cultivated on microporous membranes.

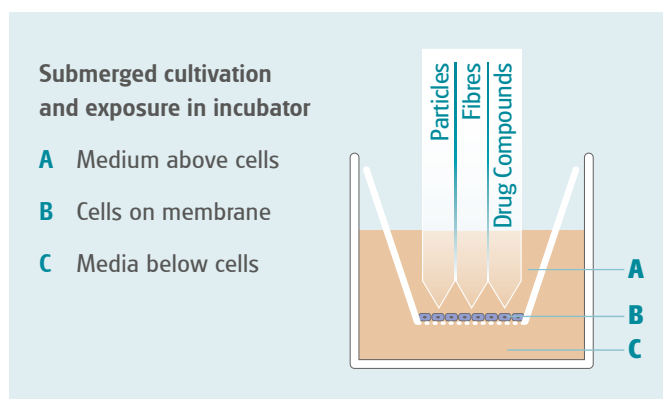
This approach allows for more credible and authentic results than by submerged exposure due to a closer replication of the human physiology.

The advantages

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



Disadvantages of submerged exposure



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 medium. This procedure results in an undesired interaction of the formerly airborne substances with the medium, causing limitations for authentic analysis.

Therefore VITROCELL® recommends the air/liquid interface exposure technology.

Exposure Principle

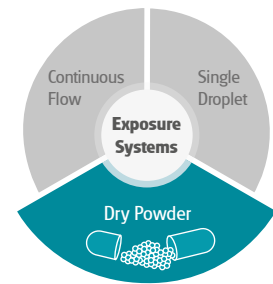
Dry Powder Exposure

VITROCELL® Dry Powder Exposure Systems are specially designed for aerosolization of smallest quantities of dry powders. This method is well suited for scarce and very expensive materials, such as new drug candidates or particle samples from the environment.

Here quantities from 1 to 100 mg can be aerosolized.

The sample is placed in the quick-lock loading system and nebulized under high pressure into the expansion chamber directly above the cell cultures.

Aerosolization can be repeated a few times to obtain a dose-response profile.



Quick-lock loading system open (left). Sealed expansion chamber (right).

Main application areas



- Dry powders
- Pharmaceutical compounds
- Nanoparticles
- Chemical powders

Dry Powder Exposure System



PowderX

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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