

Advanced in vitro exposure systems

VITROCELL® Powder Chamber



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For exposure to smallest quantities of dry powders

This system is specifically designed for dose-controlled and uniform deposition of dry powder aerosols on cells cultured at the air/liquid interface.

The dry powder can be applied from all commercially available inhalers or via direct dosing.

A typical powder quantity for exposure is 20 mg per experiment.

Exposure Process

Duration for a single experiment lasts approx. 20 minutes. The powder is transported via negative pressure from the inhaler or direct dosing device to

4 independent sedimentation tubes. After these are filled, the 4 cell culture insert compartments are moved under the sedimentation tubes for exposure.

The entire process is sequenced automatically by editing the VITROCELL® Powder Chamber Controller.

Process Parameters

The following process parameters can be varied to optimize the results:

- sedimentation tube length (10 – 30 cm)
- Flow rate (l/min)
- Sedimentation time (s)
- Exposure time (min)
- Filling time (ms)



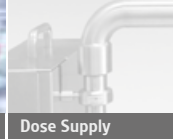
Adaptors for all commercially available dry powder inhalers

- 1 Particle release
- 2 Sedimentation tubes
- 3 Exposure tray
- 4 Controller





Exposure Systems



Dose Supply



Dilution



Racks & Carts



Dose Monitoring



Skin Exposure



Auxiliary Equipment



Process Steps

1 | Insert loading

The exposure tray houses 4 compartments for 12-well sized cell culture inserts or optional Quartz Crystal Microbalances. The tray is shown in the loading position.



2 | Filling of sedimentation tubes

Filling of the sedimentation tubes is performed by a controlled air flow. Subsequent sedimentation takes place via gravity and without active flow. Filling and sedimentation times are edited in the controller unit. The tray is shown in the sedimentation position.

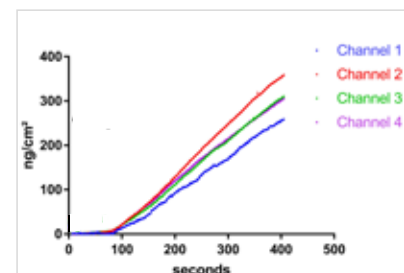


3 | Exposure to inserts

After filling and sedimentation, the tray is moved to connect the sedimentation tubes with the cell culture insert compartments. The desired exposure duration time is edited in the controller unit. The tray is shown in the exposure position. After exposure the tray is moved back to position 1 to access the exposed inserts.

Dose Monitoring

All 4 cell culture insert compartments can be equipped with Quartz Crystal Microbalances for evaluation and monitoring of the dose.



Features

- Deposition of small particles
- For 12-well sized inserts
- Exposure to 4 wells
- Controlled dry powder release
- Deposition by sedimentation and diffusion
- Flexible flow rates
- Easy handling
- Physiological air/liquid interface conditions

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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