

VITROCELL® Powder Chamber

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For Exposure to Smallest Quantities of Dry Powders

This novel 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. For optimization of the process to various test-substances, the user is able to alter a series of parameters. A typical exposure experiment itself takes only 30-60 minutes.

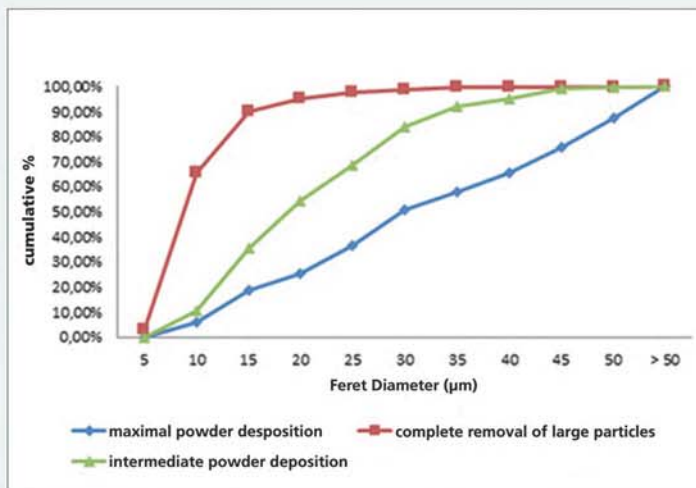


Overview of the complete VITROCELL® Powder Chamber setup

Customer Example 1

We investigated different experimental setups to evaluate the influence on deposition characteristics of an Active Pharmaceutical Ingredient (API) loaded formulation with a broad size distribution. The following parameters were identified which led to different particle sizes and different deposited masses.

	Flow rate	Sedimentation time	Exposition time	Tube length	Filling time	Mass [$\mu\text{g}/\text{cm}^2$]
maximal powder deposition	30 L/min	0 s	30 min	30 cm	600 ms	~1.8
intermediate powder deposition	30 L/min	10 s	10 min	20 cm	600 ms	~1.2
complete removal of large particles	30 L/min	5 min	30 min	20 cm	1500 ms	~0.7



Customer Example 2

In a cooperation of Bayer Vital GmbH, PharmBioTec GmbH and Bock Project Management, the Powder Chamber was successfully applied to study pollen deposition on nasal in vitro model (MucilAir™). The SEM image shows pollen interacting with mucus-like structures after aerosolized pollen deposition on an air-liquid MucilAir™ cell culture system.

The publication entitled **Combining MucilAir™ and Vitrocell® Powder Chamber for in vitro evaluation of nasal mucosa pollen protective ointments** is currently in preparation. The team involved the following researchers and affiliations: Julia Metz^{1,2}, Katharina Knoth¹, Henrik Groß¹, Claus-Michael Lehr^{1,2,3}, Carolin Stähler⁴, Udo Bock⁵, Marius Hittinger¹.
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