

NICEATM REQUESTS INFORMATION ON TECHNOLOGIES USED FOR INHALATION TESTING

Information on device and /or technology	
Institution	Fraunhofer ITEM, Nikolai-Fuchs-Str. 1, 30625 Hannover, Germany www.item.fraunhofer.de
Contact	Department In Vitro and Mechanistic Toxicology Dr. Jan Knebel jan.knebel@item.fraunhofer.de Phone: +49 511 5350-273
Product	P.R.I.T. [®] ExpoCube [®] and P.R.I.T. [®] ControlUnit
Size	Dimension of the ExpoCube: 22cm x 10cm x 11cm
	The ExpoCube is driven by a compact 19" ControlUnit housing all necessary technical parts.
Application	Cell based <i>in vitro</i> testing of airborne substances and mixtures (gases, particle- and droplet aerosols) using air-lifted interphase cultures (ALI) in a robust and efficient way for routine applications
Compatibility/ kind of tissue culture system	Commercial 12-well multiwell plate with ALI cultures on membranes of the Corning or Becton Dickinson types (growth surface area 1cm ²). Applicability to cell lines or primary cultures, complex 3D cell cultures models or <i>ex vivo</i> tissue (precision cut lung slices, PCLS)
Amount of samples handled once	The 12 cultures of one plate can be arranged in 3 exposure groups. Two of these groups (4 cultures in each line) can be exposed separately to two different exposure atmospheres (e.g. test atmosphere and positive or negative test atmosphere control, two different concentrations or other combinations). The third group is a non-exposure control. Therefore, the entire exposure experiment can be handled on one plate.
Exposure setup	Optimized by computational fluid dynamics (CFD) with respect to efficiencies of exposures to gaseous and aerosol particulate phases.
Exposure type	Stagnation flow; individual cultures are exposed completely separated.
Particle deposition	The particle deposition from aerosols is fundamentally enhanced by application of thermophoresis as a new concept for the exposure of ALI cultures in standard multiwell plates.
Range of particles (size) managed by this system	Inhalable particle size. The particle size range used within studies until now: between 389nm and 2019nm. There is no principal limit in possible size ranges (including larger and smaller particles), although the design of the ExpoCube was primarily focusing smaller particle size ranges which can enter the deeper lungs by inhalation (with a special emphasis on particle deposition optimization of these particle sizes).
Gas phase	For studying the gas phase alone, elimination of particles can easily be managed by filtering the test aerosol flow.
Biological models	cell lines or primary cultures, complex 3D cell cultures models or <i>ex vivo</i> tissue (precision cut lung slices, PCLS)
Endpoint Measurements	Acute and repeated toxicity, genotoxicity and inflammation
Chemical vapours and	Project activities focused on acute and repeated toxicity of inhalable chemical compounds

NICEATM REQUESTS INFORMATION ON TECHNOLOGIES USED FOR INHALATION TESTING

gases	
Nanomaterials	Project activities focused on the development of pharmacologically active substances using application based on nanotechnology
Cosmetics and consumer products	Project activities focused on potential adverse effects of evaporations and aerosols from cosmetic and consumer products