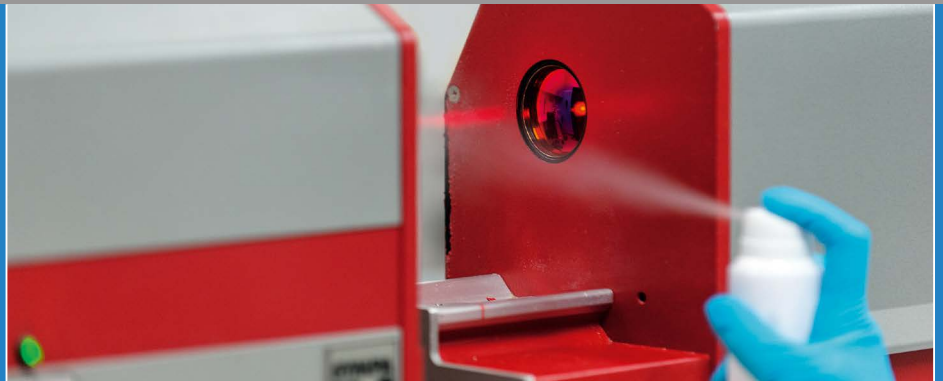


CHEMICAL SAFETY AND ASSESSMENT



EXPOSURE CHARACTERIZATION

Characterizing, assessing and measuring the respiratory uptake of substances

Assessment and characterization of human and environmental exposure by using a broad diversity of methods is among our key competencies. Our expertise in this subject area, in inhalation exposure in particular, is the result of many years of experience. We characterize human exposure to gases and aerosols/particles at workplaces, in indoor air and in the environment, with a focus on respiratory uptake. For this purpose, we combine state-of-the-art measurement technology with mathematical modeling tools and provide necessary adaptations to customize a solution to a client's specific needs or ensure its compliance with current regulations.

In addition, we employ, develop, and refine existing exposure models to assess chemical products used at workplaces and in private homes. The results serve to assess risks to

human health and the environment, to support substance and product registration and authorization, and to improve product safety.

Key topic

Taking into account the relevant regulatory guidelines, we develop custom-tailored methods and processes to determine human and environmental exposure to potentially harmful airborne substances. We perform exposure calculation for all exposure routes – oral, dermal, and respiratory – as a basis for risk assessment and support our clients with issues of product safety and product optimization. In collaboration with regulatory agencies and industry, we furthermore develop new strategies for data-based and model-based reliable exposure assessment.

Contact

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Measurement and characterization
of spray exposure.

Our services and expertise

- Physical and chemical measurement of emissions from aerosols (e.g. dusts, (nano)particles, sprays, oil mists, vapors, and microorganisms) and gases (volatile and semivolatile organic compounds)
- Inhalation exposure modeling:
 - Dispersion of pollutants (SprayExpo, e.g. for biocides; quantification of particle deposition and resuspension for indoor air models)
 - Lung deposition and absorption (inter-species comparison; clearance and solubility)
- Development of custom-tailored measurement and process technology:
 - Measurement technology for dusts and aerosols (PM₁₀, PM_{2.5}, exhaust gases, nanoparticles)
 - Aerosol generation methods (calibration aerosols, nebulization, dry dispersion)
- Process development (development of test methods and analytical procedures)
- Design of relevant exposure scenarios and calculation of the exposure – also by using commercially available models
- Development of new exposure models in collaboration with regulatory agencies and/or industrial clients

Your benefits

- Customized development of instruments and analytical procedures
- Development of product-specific concepts and testing strategies for in-depth characterization of potential exposure risks
- Efficient and on-time project work benefiting from the expertise of our experienced team
- Strong network in inhalation research inside and outside of the institute
- Strong network in the scientific community with regard to exposure assessment

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The Fraunhofer Institute for Toxicology and Experimental Medicine ITEM is one of about 70 institutions of the Fraunhofer-Gesellschaft, Europe's leading organization for applied research. Protecting man from health hazards in our industrialized world and contributing to the development of novel therapeutic approaches are the aims Fraunhofer ITEM is pursuing with its contract research, with a focus on airway research.

In the area of chemical safety we assess the risks from potentially harmful substances and support the development of novel products with an eye on human health and the environment. We can draw upon a broad spectrum of expertise, covering toxicology testing, exposure assessment, analytical methods, regulatory research, and chemical risk assessment.

From compound to safe products

Development of test and analytical methods

Toxicology testing

Exposure characterization

Regulatory research and risk assessment