

EUROCHAMP-2

EUROCHAMP-2 is a European project which aims a better integration of simulation chambers or studying atmospheric processes. Eurochamp is funded within the EC 7th Framework Programme , Sections “Support for Research Infrastructures – Integrated Infrastrucutre Initiative” EUROCHAMP-2 started on May 1, 2009 for a 4 year period and it is the successor of EUROCHAMP-1 from June 1, 2004 until May 31, 2009. Today 14 European partners are the backbone of this project, which developed a grid of environmental chambers designed for the scientific investigation of atmospheric chemical processes. EUROCHAMP intends to make better use of these expensive facilities by breaking down boundaries between national research institutions and opening up access to a wider range of researchers

Chemistry of Indoor Air: Search for Stealth Compounds

The hypothesis of the project is that irritating and/or toxic substances are products of chemical reactions taking place in indoor air when organic compounds contained in indoor air with origin in building materials or consumer products (*e.g.* cleaning agents and air fresheners) react with ozone or ozone/nitrogen oxides mixtures. Identity of these compounds is unknown to the health scientists to judge the irritation potential. The products escape detection by conventional measurement techniques; hence the name “*stealth compounds*”. Concentrations of the stealth compounds are such that they may affect human well-being and health. Formation and accumulation rates of these products in indoor air may be suppressed by *e.g.* appropriate choice of ventilation strategies.

Main goals of the proposed project are:

- Provide information about the identity, formation rates and likely concentrations of the stealth compounds produced by the chemical processes in indoor air to those involved in exposure and health considerations.
- Develop a mathematical model for atmospheric chemistry indoors, including both the chemistry and ventilation, to help the ventilation and health decision makers on regulation strategies.

Ultrafine particles in the indoor air: Measures to substantially reduce human exposure

The objectives of the proposed project are to:

- Identify the principal factors influencing the indoor concentrations of ultrafine particles (UFPs), especially various measures to reduce human exposure indoors, *e.g.* air filtration, room air cleaners, restricted use of potential indoor sources, restrictions regarding window airing bringing ozone indoors
- Quantify to what extent indoor environments can be designed, operated and maintained in order to achieve a substantial reduction of the indoor concentration of UFPs
- Identify and quantify the reaction products of ventilation filter materials with ozone
- Further develop a method for prediction of UFP concentrations in indoor environments based on a particle number balance model.

The work is based on both laboratory and field measurements as well as modelling, focusing on various residential buildings, offices and schools. A doctor thesis produced within the applying research group, as well as preliminary simulations, indicate that it is feasible to design ventilation systems to reduce the indoor concentration of UFPs substantially, and consequently protect the population from a potential health hazard. The overall purpose is to verify the indicated results and to establish recommendations for the design of ventilation systems.