

Individual Abstracts (max 5 abstracts):

Abstract 1:

Title: Comparison of exposure to VOCs in offices and homes during remote work.

Author and co-authors: Pertti Pasanen, Heta Mustonen, Katja Holm, Marko Hyttinen, Maija Leppänen

University of Eastern Finland, Department of environmental and biological sciences, Finland

In Finland, working remotely has become more common in recent years. The aim of this study was to evaluate working conditions and exposures at home and compare those in office environments offered the employer. The remote home offices (n=71) were selected voluntary basis among office workers in university, a city, bank and two research institutes. Environmental conditions, T, RH, air exchange rate, and concentrations of CO₂ and volatile organic compounds were measured from workers home and office. VOC samples were collected into Tenax TA[®] adsorbent tubes and analyzed with a TD-GC-MS equipment during the normal working day.

The results showed differences between home and office environments. The averages of CO₂ concentrations were 830 ppm and 540 ppm at home and workplace offices, respectively. Correspondingly the average concentrations of TVOCs were 200 µg/m³ and 33 µg/m³. These differences are explained partly by lower ventilation rate in homes than offices, 0,32 vs. 2.2 dm³/s/m². At home offices the workers exposed to more complex mixtures and significantly higher concentrations of VOCs (average number of quantifiable VOCs 45, concentration ranges 35-1300 µg/m³) than at office environments (n=18, 2-370 µg/m³). The most abundant compounds at home environments were terpenes and aldehydes. Decamethylcyclopentasiloxane (max conc. 1200 µg/m³) was commonly present at homes (80%) and but less (max 33 µg/m³) in offices (13%). The results revealed that there are more individual sources for VOCs (e.g. consumer product, cosmetics) at home environment than at offices, and also more efficient ventilation dilutes the concentrations in offices lowering the exposure.