

Easy to use measurement equipment for emissions from interior finishing materials in buildings in use

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Introduction

Emissions from new materials like flooring, paints, and adhesives after renovation can cause annoyance. Mostly the different firms involved pass the responsibility to each other without any examination. In that case the principal has to prove which of the materials is responsible for the emission. The aim of this study was to develop a new measurement method with an minimal of cost and easy to use as an alternative for CEN ENV 13419 Part 2.

Methods

To identify the source the air samples from emission cells and from the room air were compared. Used were 12-litres emission cells (Figure 1). These were made from trays of normal stainless steel which are use in the kitchen of restaurants.



Figure 1. Emission cell against the wall.

After thorough ventilation emission cells were put against the wall and on the flooring. This was repeated in 3 different rooms of the office

building. After a period of 8 hours while the room was closed air samples were taken from the emission cells and from the room air on Tenax. The flow was 0.1 L/min and the sampling volume 3 l.

The analysis was done by gas chromatography coupled with a mass spectrometer. Because of the compounds that are typical for solvent-free materials the extraction from the Tenax was done by thermo-desorption.

Results

For a preliminary indication of the sources after an hour the emission cells were slightly lifted to have a first impression of the sources.

The analysis of the air samples showed that 15 different compounds, mostly aldehydes, coming from the flooring had significantly higher concentration. Most of these compounds have a low odour threshold. The characteristics of the smell did not correspond with an odour problem caused by aldehydes. Further analyses showed a high concentration of a mixture isoalkanes (C₈-C₁₃).

Conclusions

Although the ventilation rate in emissions cells was 0.5/hour the study showed that it is possible to identify an source if the concentration in the emission cell was significantly (> 30%) above the room air concentration. At similar concentrations it must be assumed it deals with a secondary contamination.

The study showed that it is possible to measure the source of the emissions from a surface with the payable emissions cells which were used.