Comparison of mixing and displacement ventilation in a low energy office building during heating season - DTU Orbit (08/11/2017)

Comparison of mixing and displacement ventilation in a low energy office building during heating season
The present study investigated the performance of mixing and displacement ventilation systems in a low energy office building during heating season. Measurements were performed with regard to air distribution and ventilation effectiveness. The results show that indoor air temperatures in occupied zone was 21.0°C for mixing ventilation and 20.8°C for displacement ventilation when supply air temperature was 19°C and air change rate was 4.2 h-. Vertical air temperature difference between the head level and the foot level were all less than 3°C and local air velocity were all less than 0.2m/s for both ventilation systems. In addition, local ventilation effectiveness ranged from 0.91 to 0.94 for mixing ventilation and from 1.03 to 1.17 for displacement ventilation. Distributions of vertical air temperature and velocity and horizontal contaminant concentration were more uniform for mixing ventilation compared to those for displacement ventilation. Due to the heat emission from equipments and occupants, heating system was not needed in the low energy office building in a mild winter. In such a situation, indoor thermal environment was still acceptable in terms of the general thermal comfort and the local thermal discomfort for a standard office worker.

General information
State: Published
Organisations: Department of Civil Engineering, Section for Indoor Climate and Building Physics, Xi'an Jiaotong University , Harbin Institute of Technology
Authors: Fang, L. (Intern), Olesen, B. W. (Intern), Wu, X. (Ekstern), Wang, F. (Ekstern), Zhao, J. (Ekstern)
Pages: 492-499
Publication date: 2014

Host publication information
Title of host publication: Proceedings of Indoor Air 2014
BFI conference series: International Conference on Indoor Air Quality and Climate (5010063)
Main Research Area: Technical/natural sciences
Conference: 13th International Conference on Indoor Air Quality and Climate, Hong Kong, Hong Kong, 07/07/2014 - 07/07/2014
Publication: Research - peer-review › Article in proceedings – Annual report year: 2015