

Human response to ductless personalized ventilation coupled with displacement ventilation - DTU Orbit (09/11/2017)

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A human subject experiment was carried out to investigate the extent to which ductless personalized ventilation (DPV) in conjunction with displacement ventilation can improve perceived air quality (PAQ) and thermal comfort at elevated room air temperature in comparison with displacement ventilation alone. The experimental conditions comprised displacement ventilation alone (room air temperature of 23 °C, 26 °C, 29 °C) and DPV with displacement ventilation (26 °C, 29 °C), both operating at supply air temperatures 3, 5 or 6K lower than room air temperature, as well as mixing ventilation (23 °C, 3 K). During one hour exposure participants answered questionnaires regarding PAQ and thermal comfort. PAQ was significantly better with DPV than without DPV at the same background conditions. Thermal comfort improved when DPV was used. Combining DPV with displacement ventilation showed the potential for improving PAQ and thermal comfort when room air temperature is above the comfortable temperature range.

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