Energy Impact of Ventilation and Air Infiltration
14th AIVC Conference, Copenhagen, Denmark
21-23 September 1993

The Evaluation of Ventilation Effectiveness Measurements in a Four Zone Laboratory Test Facility

J R Waters, C E Brouns

Coventry University, School of the Built Environment
Priory Street, Coventry CV1 5FB, UK

ABSTRACT

The Evaluation of Ventilation Effectiveness Measurements in a Four Zone Laboratory Test Facility

Improvements to ventilation systems for the purpose of saving energy may also affect the provision of good air quality. Measurement of ventilation effectiveness may be used to determine whether or not good fresh air distribution and satisfactory contaminant removal has been achieved in a specific case. However, for such measurements to be useful, it is necessary to establish recommended values of the parameters and to check the reliability of the measurement procedures. This paper is concerned with the second of these problems. It is well known that both air change efficiency and contaminant removal effectiveness can easily measured when there are clearly defined supply and exhaust ducts for the ventilating air, and there is no re-circulation. However, measurement become more difficult when these conditions are not satisfied. Also, in all cases, tracer gas measurements often require the estimation of end corrections to exponential decay curves, with a possibility of large errors. This paper reports on the first part of a systematic exploration of ventilation effectiveness measurement methods, carried out in the four zone test facility described by Brouns and Waters. Several different flow patterns and ventilation strategies are tested, and comparisons with some full scale measurements are made.