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Chair with Integrated Personalized Ventilation for Minimizing Cross Infection

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1 Introduction

Personalized Ventilation (PV) has proven to be a very efficient system to protect people from cross infection because clean air is supplied direct to the breathing zone.

The idea behind the present PV system is to utilize the fact that the head or the body is in natural contact with surfaces as chairs, neck support pillows, pillows, clothing, etc., and those surfaces are designed also to be a supply opening of fresh air. A neck support, a supply opening covering the whole chair, and a version with two areas along both sides of the chair (seat straps), have been tested. The system can be used in aircraft cabins, trains, buses and offices.

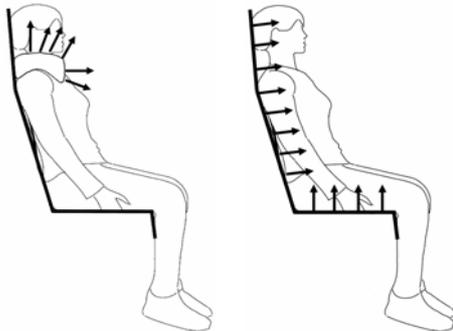


Figure 1. Personalized ventilation diffuser designed as a neck support pillow and as a seat.

2 Methods

The tests are made in a full-scale room with a breathing thermal manikin. N₂O is added to the supply flow giving a concentration in the room of 20 to 30 ppm. All the experiments are isothermal.

3 Results

Figure 2 shows the results for the neck support. An effectiveness larger than 80% is obtained for

PV flow rates above 10 l/s (1.0 corresponds to inhalation of clean air, and 0.0 to inhalation of fully contaminated room air).

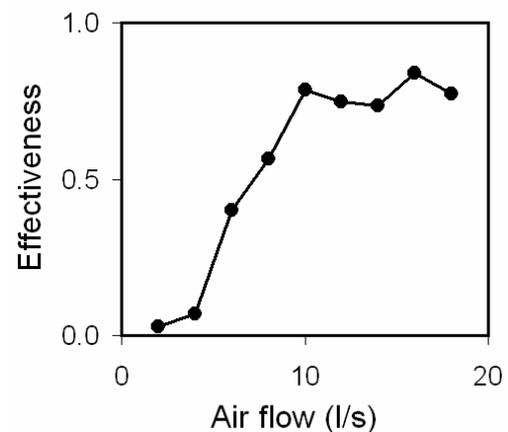


Figure 2. Effectiveness and experiment with smoke visualization for the neck supporter.

4 Conclusions

A neck support pillow in three different designs has been tested. The neck support has in general an effectiveness larger than 70% to 80%, and in special cases 95%. Fully integrated chair covers have also been tested, but more design work is necessary to make a final conclusion for this version of personalized ventilation.