

# Human thermal comfort in aircraft cabins

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## **Abstract**

Providing thermal comfort and good air quality are important factors to create a healthy and comfortable environment for passengers in airplane. The current ventilation system is the mixed one, 50% of air is fresh air from outside and the other 50% is recirculated air from the cabin. Personalized systems are introduced to improve those two factors. In this research the air distribution system is a combined system between the mixed ventilation system and the gaspers, the effect of the gaspers are investigated on the whole cabin of the economy section of BOEING 777 commercial aircraft. Temperature and velocity distributions are discussed; also PMV and PPD are used to predict the thermal sensation of passengers. It was found that the gaspers increase the air velocity in the cabin, makes the temperature distribution more uniform, and provide thermal comfort for passenger on his demand. The investigation is done by computational fluid dynamics package (ANSYS FLUENT 15.0), FLUENT is the solver, it solves the continuity, momentum, energy, and turbulence model equations. Meshes with sizes between 6,000,000 and 7,000,000 cells are generated in each case

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