

Abstract

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Optimization of HVAC Inlet and Outlet Position in Indoor Spaces with Different Furniture Configuration

Air conditioning is used to maintain temperature, humidity, air circulation, and air quality within an indoor environment. Although health, safety, and economics are being given increased attention comfort is still a major concern in the HVAC industry. This paper investigates the airflow pattern, comfort, and discomfort zones inside a seminar room at Egyptian Liquefied Natural Gas building. The flow patterns inside the seminar room are obtained using Computational Fluid Dynamics (Fluent Code). The objective of this paper is to use the Computational Fluid Dynamics as a design tool to get the optimum location for furniture, supply, return, and exhaust in such manner that does not affect the architectural aesthetics. Furniture is a powerful tool in location and orientation inside the architectural space. Comfort air velocity for occupants is related to their position. The location of supply, return and exhaust has a great effect on the airflow distribution inside the room. Supply, return and exhaust should be located with respect to furniture location to avoid draft which affects comfort inside the room. It is observed that different furniture configurations, and return and exhaust locations have great influence on the air flow and percentage of comfort detected inside the room.