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A Literature Review on Air flow and Ventilation

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Abstract: Through this present paper, review about the air circulation has been presented. It is quite important to have adequate air flow in buildings. Therefore research have been executed to improve the air circulations and proper design of ventilation.
Keywords: Ceiling Fan, Airflow, Ventilation

Panorama

The proper ventilation design and adequate air flow facilitates the comfort to the people Who are leaving in their building. Recently Efforts are being made to investigate the parameters required for the proper ventilation and airflow. In the prowl of executed research pertaining to the present work author has reviewed some preeminent papers , which are descried as given below

I. FAN SIZE AND ENERGY EFFICIENCY

In this paper Richard Aynsley [1] discusses about the application of ceiling mounted circulating fan in industry and animal houses considering warm and humid climates. An approach to improve the efficiency is also discussed nicely. Industrial ceiling fans are used to demonstrate that using larger, slower, fans will not only improve energy efficiency but also reduce fan noise. It is also mentioned that large diameter fan can save more energy than the conventional fan. The emphasis has been given on the field study regarding the airflow characteristics of ceiling fan in Industrial Premises. An approach of CFD is suggested by the Author.

2.2 The Impact of Urban Wind Environments on Natural Ventilation.

In this paper Erdal Turkbeyler, Runming Yao, Rosario Nobile, Tom Bentham, David Lim [2] authors discuss about the Impact of urban wind environments considering the natural ventilation. Further an approach of Numerical study to evaluate the urban airflow considering the building blocks is also presented. In this paper an author has used Computational fluid dynamics to simulate the urban environments and it then corroborated with the experimental readings

2.3 Parametric Analysis of Air Flow through Ventilators

In this paper "Nelson Chilengwe" [3] author focused on the design of natural ve ntilation design in buildings. It is also emphasized that the driving force of natural ventilation is less as compared to mechanical system. Through this paper author has carried out the experimental study on flow measurements through the individual louver and mesh components were compared to the air flow through mesh / louver combination. A CFD approach is also applied to evaluate the work

2.4 CFD Modeling of Natural Ventilation: Combined Wind and Buoyancy Forces

In this paper M. J. Cook, Y. Ji and G. R. Hunt, **[4]** authors have reported About the simulation of CFD for the wind stack ventilation of single -storey enclosure and its compared with the experimental and analytical model. The comparison shows closed agreement of thermal stratification predicted by the CFD and the analytical model and experimental measurements. How to apply the appropriate boundary conditions are also presented through this paper.

2.5 Impact of Open Windows on Room Air Flow and Thermal Comfort

Per Heiselberg, Erik Bjørn & Peter V. Nielsen [5] reported about the natural ventilation system. It is given that the size and location of windows plays an important role in facade. Through this paper a laboratory

investigation has been carried out to elevate the thermal comfort and also discussed about the impact on various openings strategies situated in the office space. The different opening strategies gives different airflow results and thermal comfort conditions

2.6 Air flow and particle control with different ventilation systems in a classroom

Holmberg, S. and Chen, Q.[6] stated that the the air conditioning systems and ventilation are designed without giving prime importance to setting particle behave in air flow. The former studies revels that high concentrations of settling respirable particles can be found in the breathing zone, and that the exposure rates can be a health hazard to occupants. The stress has been given on how ventilation systems could be designed to mitigate respirable airborne particles in the breathing zone. CFD analysis has evaluated and Particle concentrations, thermal conditions and modified ventilation
system solutions have been presented

Conclusion:

Through the present review, author has studied air circulation system and ventilation design. It is concluded that there is a scope remained in the area of air ventilation design and need to focus on how to improve the comfort of building and industrial premises. It is also felt that the use of computational fluid dynamics should be aggrandized during design of ventilation system.

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