

RESEARCH ON THERMAL CONDITIONS IN VENTILATED LARGE SPACE BUILDING

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Abstract

The aim of the paper was to verify whether it is possible to predict thermal indoor environment in an industrial facility, characterized by large cubature and significant heat sources using a computational fluid dynamics (CFD) technique. For this purpose, thermal imaging measurements were carried out to obtain boundary conditions, followed by numerical simulations of the airflow using the Ansys CFX software. Direct results of temperature and velocity distribution of air were analyzed for two different cases. The possibility of reducing the supply airflow rate without affecting either technology safety or thermal comfort was examined. The results of calculations can be helpful for improving the energy efficiency of the tested object by indicating the optimal operating modes for given operating conditions of the production hall.

Keywords: CFD; Large space building; Thermal conditions; Thermovision; Ventilation.