

NUMERICAL PREDICTION OF THE PROPAGATION OF GASEOUS CONTAMINANTS IN THE VENTILATED LABORATORY

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Keywords: ventilation, laboratory, airflow, contamination, numerical prediction.

Summary

The aim of the presented investigations was to improve the quality of CFD numerical modeling of the propagation of gaseous contaminations in a test laboratory with a tracer gas source and a local exhaust in general mixing ventilation. The investigations were carried out making use of experimental identification of the flow. Concise information is presented concerning the CFD method applied in the modeling of the airflow and gaseous contaminant. The tested object has been characterized, as well as its respective experimental data. The ways of generating its simulation model has been described, paying special attention to the simulation of the diffuser. The results of prediction have been compared with the results of measurements of the air velocity and the concentration of gaseous contaminant. Attempts have been made to improve the quality of the obtained results of prediction of the distribution of tracer gas concentration by increasing the accuracy simulating the diffuser, the jet leaving the diffuser and the airflow pattern in surrounding the contaminant source and suction nozzle. It has also been tried to utilize the results of numerical prediction for the purpose of determining the effectiveness of the local exhaust.