

NUMERICAL STUDIES ON THE NATURAL SMOKE VENTING OF ATRIA

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Abstract

The use of numerical fluid mechanics to model smoke flow in buildings where a fire develops is common. It allows to check the effectiveness of ventilation systems at the design stage. It also gives the opportunity to determine the conditions that will be on escape routes. Numerical analyzes of smoke flow in buildings are most often performed using Fire Dynamics Simulator (FDS).

The paper presents numerical analyzes performed for the atrium building. The purpose of the calculations was to build a numerical model that corresponds to the real object located in the laboratory in Murcia, Spain. The analyzes consisted of fitting a numerical model based on the temperature distribution at selected points of the atrium. The model mapped the geometry of the real building and assumed the same fire power. Calculations showed high temperature compliance throughout the atrium, except for the vicinity of the fire source itself.

Keywords: FDS; Natural venting; Atrium.