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## NUMERICAL STUDY OF CONDITIONS ON THE STAIRCASE DURING A FIRE IN A PUBLIC BUILDING

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### Abstract

Fire is one of the most common risks to the environment and human health. Fire, depending on the conditions of combustion and the type of fuel, can emit many toxic products. The paper presents numerical analyzes of the conditions that can occur in a building during a fire. The conditions were analyzed in terms of the safety of the occupants and possible emissions of pollutants into the atmosphere. The temperature, propagation of smoke, and emission of pollutants were analyzed. A numerical model was created using Fire Dynamics Simulator (FDS) software. The model represents a staircase and a corridor in a real building located at the Silesian University of Technology in Poland. The results show that safe conditions are only ensured for a limited time, and emissions can also be harmful to occupants and the environment.

Keywords: Fire; FDS; Numerical study; Staircase.