

## **Numerical Study on the Interaction of Sprinklers and Heat Vents.**

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### **Abstract**

Currently, there are available several models to design and evaluate sprinklers and heat vents independently. However, models that study the interaction between these two components are scarce and are not sufficiently developed. The following work first presents a literature review of experiments and models developed to study this interaction. Next, a Computational Fluid Dynamics model (CFD), is developed based on the large test room from the Swedish National Testing and Research Institute reported by Ingason and Olsson (1992). In this model, the effect of sprinkler location and water flow on heat vents is studied. A second CFD model based on the report of the National Institute of Standards and Technology (NIST), *Sprinkler, Smoke and Heat Vent, Draft Curtain Interaction* (1998) is also developed to study the effect of vents on sprinkler activation times. A discussion of the experimental results and validation of the two models is presented to then show the main conclusions found during this work.