Thesis Abstract cohort 2012-2014
The International Master of Science in Fire Safety Engineering

ROLFF LEISTED

Design fire for building content in arson scenarios

The cost of fires caused by arson on a global-scale is estimated between 0.1 and 0.4% of a country's GDP. If arsonist uses liquid accelerants is the potential for growth much greater and the risk for loss of live is increased. It is desirable to reduce this risk by anticipating the accelerant in the design phase.

In this thesis the possibility of predicting components behaviour when accelerants are added is investigated by use of small-scale experiments. The specimens were ignited with a smaller ignition source and the heat release rate was measured using oxygen calorimetry. Data was analysed using factorial analysis and functional analysis. It was showed that both methanol and heptane affected parameters such as the time to peak, peak heat release rate and growth rate in a way that made the foam and fabrics behave worse.

With superposition was it possible to predict the total heat released with a 12% error on average for standard non flame retarded foam.

The increase in growth rates is found to be of such magnitude that accelerant as part of the ignition source should be accounted for in the design phase if an arson scenario is deemed likely.