

The Impact of Water-Based Fire Suppression Systems on Combustion Products

Results from a series of experiments on studying the impact of water-based fire suppression systems on combustion products were recently published in Fire Technology. Results show that the high-pressure water mist (HP-mist) system was more effective than the low-pressure water mist (LP-mist) and sprinkler systems in reducing the amount of combustion gases during suppression, resulting in lower Fractional Effective Doses (FED).

The fuel was a high-density polyethylene (HDPE) pallet placed on two wood pallets. Various suppression systems were studied, at operating pressures ranging from 2 to 60 bar and water flow rate ranging from 10 to 206 L/min. The main combustion products identified were CO_2 , CO,

and H_2O . In addition, NO_x (nitrogen oxides), C_xH_y (light-weight hydrocarbons), and HCN were present in relatively high concentrations. When the fire could not be immediately extinguished, the NO_x , C_xH_y , and HCN concentrations were higher than those in the baseline experiment without suppression.

The results show that water-based suppression systems are effective in fire suppression, not only in reducing the fire size but also in reducing the production of acute toxic gases.

Links to more info

The paper is published under open access and can be freely downloaded here:

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