*** ABSTRACT ONLY ***

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Advanced Fire Detection

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Abstract

Current test protocols and certification processes have been developed to accommodate specific detection sensor technologies. Test methods exist to evaluate specific classes of sensors, e.g., ionization, optical, temperature, or CO, etc. In the past, the fire or smoke sources used in these test methods were optimized for a unique fire or smoke property to quantify detector response. To improve detection sensitivity and reduce false alarm rates, industry has developed new sensors. Some designs are based on the measurement of different aspects of the fire source than those traditionally evaluated by current test methods. Other designs are based on specific combinations of sensors that can help in distinguishing a real fire source from a false reading. Existing test methods may not be able to evaluate and quantify the performance of new sensing methods or multi-detector systems.

A first generation Fire Emulator/Detector Evaluator (FE/DE) will be described that controls air velocity, temperature, smoke concentration, and CO concentration. Test results on these parameters will be presented and compared to several CEN 54 fire sources. CEN 54 is a European test method that defines a room fire test and several fire sources for the evaluation of specific fire detectors. Using CEN 54 ceiling data at the detection site as representing a standard set of fires, air velocity, temperature, CO, and smoke concentrations as a function of time have been characterized. Preliminary results will also be presented on response characteristics of a set of spot-type fire detector designs. A new smoke generator will be described that was designed to replicate key physical attributes of particulates produced in these standard fires.