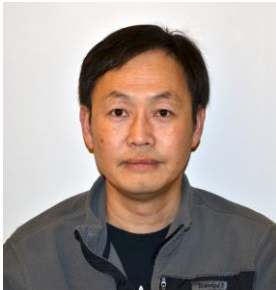




Session 1C

Evaluation of Oxygen Reduction Systems (ORS) in Large-Scale Fire Tests

An oxygen reduction system (ORS) is a fire prevention system that uses a low-oxygen environment to reduce the potential for ignition and fire propagation in a protected space. The key parameter for ORS design is the limiting oxygen concentration (LOC), defined as the lowest O₂ concentration that can support fuel combustion. To simulate current ORS applications, large fuel arrays of standard commodities were set up in an enclosure with controlled oxygen concentrations. Five standard combustible commodities were tested consistently using a premixed flame igniter. The resulting LOC values were found to be 11.1% for cartoned and 13.0% for uncartoned commodities with a sustained ignitor. Somewhat higher values of 13.8% oxygen for cartoned and 14.7% for uncartoned commodities were found with ignitor shut off within ~1 min after ignition, these values however were dependent on the ignition duration. This study illustrates that, although not a replacement for the fire sprinkler protection in general, ORS with adequate availability may be used in well-sealed and unoccupied enclosures that can consistently maintain a uniform reduced oxygen concentration that is generally lower than that recommended in existing standards including Vds 3527 and EN 16750.



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