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An Experimental Study on Burning Characteristics of n-Heptane/Ethanol Mixture Pool Fires in a Reduced Scaled Tunnel AHMET YOZGATLIGIL, SINA SHAFEE, Middle East Technical University — Fire accidents in recent decades have drawn attention to safety issues associated with the design, construction and maintenance of tunnels. A reduced scale tunnel model constructed based on Froude scaling technique is used in the current work. Mixtures of n-heptane and ethanol are burned with ethanol volumetric fraction up to 30 percent and the longitudinal ventilation velocity varying from 0.5 to 2.5 m/s. The burning rates of the pool fires are measured using a precision load cell. The heat release rates of the fires are calculated according to oxygen calorimetry method and the temperature distributions inside the tunnel are also measured. Results of the experiments show that the ventilation velocity variation has a significant effect on the pool fire burning rate, smoke temperature and the critical ventilation velocity. With increased oxygen depletion in case of increased ethanol content of blended pool fires, the quasi-steady heat release rate values tend to increase as well as the ceiling temperatures while the combustion duration decreases.

Ahmet Yozgatligil
Middle East Technical University

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