Abstract

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Water mist systems have seen an increase in use as an alternative clean agent fire suppressant since the late 1980s after the use of Halon gases were discontinued. One of the potential uses of these systems is to provide a protective curtain between a fire and desired target. The following experimental work investigates the radiation attenuation abilities of a single water mist spray. These experimental results are the first ever conducted with high pressure water mist. Two sources of heat flux were utilized: radiant panel and diffusion flame line burner. Radiation levels were measured along the normal propagation path and at an angle of ±5º above and below the normal in the vertical plane. Attenuation levels were found to be greater than 40% for all locations 300+ mm below the nozzle. Initially the attenuation is high near the nozzle, decreases in intensity until 200 mm, rises again until the 500 mm mark, and then experiences a slight decrease below 500 mm. This S-curve shaped attenuation distribution is attributed to the droplet size, volumetric water concentration, and residency time of the droplets. Water mist curtains can be an effective way of protecting high value targets from radiation.