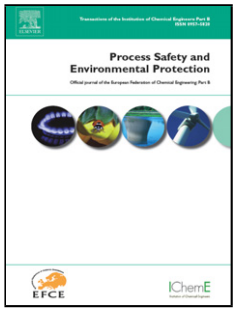

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A Study of Water Cooling using Different Water Application Techniques to Protect Storage Tank Walls against Thermal Radiation

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Abstract

Amongst the hazards associated with storage tanks is the effect of the thermal radiation that results from an adjacent tank fire and its consequences for the mechanical strength of the metal and the tank contents at elevated temperatures, which may lead ultimately to the failure of the tank. A series of tests was undertaken to study the generation of dry spots and the effectiveness of the use of water cooling in reducing the hazards of fire for adjacent tanks. The research involved an extensive programme of experiments studying the effectiveness of different water cooling techniques on mitigating tank and pool fires. The work was conducted at Asturias, Spain, by the LASTFIRE Project. This report gives a description and the findings of the work performed, which involved evaluating the effectiveness of water cooling in reducing the heat loading on an adjacent tank impacted by a pool fire. The results demonstrate that water cooling and the liquid in the adjacent tank can significantly reduce heat loading, as the wall temperature is maintained below that at which catastrophic failure might occur, or such that the rate of temperature rise is