

Controlling fire growth in electrical cable compartment by reducing oxygen concentration at horizontal orientation

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Abstrak

A series of laboratory tests for electrical fires have been carried out by researchers, and some of the results have confirmed and been adopted as standard. However, the studies focus on electrical fires in PVC insulation material and the melting temperature and toxicity of PVC insulation. By focusing on heat conductors, the growth and spread of a fire can be eliminated by reducing the oxygen concentration, especially inside the compartment. Electrical fires are the most common cause of compartment and building fires both internationally and nationally, according to statistics (Liu & Benichou, 2008). Whatever the triggers are inside the electrical compartment on the connection, termination, or cable, this research looks into electrical fires caused by 1.0–1.5 mmsq electrical cables. Electrical fires in cables are normally started by increasing temperatures inside the cable conductor. By controlling and adjusting the oxygen concentration inside the electrical compartment under atmospheric concentration, one can hamper a fire's start, trigger, propagation, and growth. This study investigates the effectiveness of oxygen concentration on preventing the growth of fires triggered by electrical cabling. A series of studies were created in laboratory scale in a horizontal compartment with oxygen levels of 19%, 17%, and 15%. This paper presents the results of this experiment by studying the effects of reducing oxygen concentration on the fire growth in cable network in a horizontal orientation. The results show that controlling the oxygen concentration at levels lower than atmospheric concentrations can effectively reduce the propensity for cable ignition and lower the fire propagation rate.