

Sustainable Flame Retardant Development For Aircraft Cabin Safety

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ABSTRACT

Changing worldwide chemical regulations and mounting market pressure are impacting many simple consumer goods that are used on a daily basis, as well as much more complex products, such as electrical and electronic equipment, automobiles, and aircraft. The implications of changing regulatory programs impact a broad range of materials, including solvents, polymer additives, and many other substances. One group of materials that has gotten a considerable share of attention is the class of polymer additives referred to as flame retardants.

In the end-use application, flame retardants delay the spread of fires or delay the time of flashover in order to enable people more time to escape the effects of the fires. It has been well documented that the use of flame retardants has resulted in a substantial reduction in fire deaths. One such example of the benefits of flame retardants in aircraft applications was seen when an Air France jet crashed on landing at Toronto's Pearson International Airport on August 2, 2005. Flame retardants were credited as a key factor in preventing loss in life by increasing escape times and allowing all 309 passengers to escape before the jet was completely consumed by fire.

Emerging chemical regulations are focusing on the need for characterizing all chemical substances in use in terms of their environmental and human health impacts. In response to market driven and regulatory challenges, alternative flame retardants are being developed to meet these demands. This paper will review the fire safety benefits of flame retardants, differences in various flame retardant technologies, issues surrounding specific flame retardants, currently used flame retardants, and alternative technologies. Discussions will also focus on the attributes desired for sustainable solutions and a new environmentally sustainable flame retardant technology will be presented.