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Ingmar Geiß¹, Rudolf Voit-Nitschmann²

Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering, First Published 4 Aug 2017.

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Faheem Uddin

Journal of Industrial Textiles, vol. 45, 5: pp. 1128-1169. , First Published June 30, 2014.

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Flame-retardant fibrous materials in an aircraft

2016, Vol. 45(5) 1128–1169

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DOI: 10.1177/1528083714540700

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Faheem Uddin

Abstract

An increasing number of flying hours requires an improved level of confidence in safety and comfort for crew staff, passengers, and valuables. Alternative or improved material utilization in interior furnishing and structure is perceived important in producing an aircraft. Fibrous material used in an aircraft may enhance the level of safety and the desired effects in producing the structural components. Aircraft accidents and losses to lives and valuable caused by fire are known in aviation history. Flammability in an aircraft as a leading cause or as a subcause may be prevented through an appropriate utilization of flame-retardant (FR) fibrous materials used in aircraft design and manufacturing and in interior furnishing. Improving the prevention of fire hazard through reduced flammability materials was a desired activity for achieving safer air travel. Important FR fibers (FR finished natural fibers and high-performance fibers including synthetic polyamides, carbon, and ceramic fibers), finishes (organophosphorus reagents), and fibrous structural components in aircraft are discussed. FR finishes including brominated FR with reference to recent environmental concerns are described. Standard testing of FR fibrous material based on the Federal Aviation Administration regulations are introduced for any flammability requirements. This study is particularly conducted to appreciate how fibrous materials are useful in improving the flame retardancy and any other performance factor including safety and reduced fuel consumption in an aircraft.

Keywords

Aircraft, safety, flammability, fiber material, fire, interior, structure

Introduction