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Guest Editorial: Fire and the Environment

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Awareness of the fact that large fires may present dramatic and persistent adverse effects on the environment has risen since the occurrence of numerous high impact incidents over the past 25 years [1], such as the Sandoz incident in November of 1986 when a chemical fire in an industrial warehouse near Basel in Switzerland laid waste to the Rhine [2]. Traditionally discussion of the environmental impact of fires has focused on the emissions that fires can cause both to the air, water and soil; but in recent years a new debate has arisen where the impact of chemicals on the environment and the precautionary principle have taken precedence. In the wake of the political debate concerning potential exposure to chemicals in our environment, flame retardants, used to restrict the size and number of fires in products to which they are added, have also been questioned.

New developments in materials and their performance in fires have been instrumental in the development of many products which are ubiquitous today. In recognition of the importance of research into new flame retardants and their impact on the environment this issue of Fire Technology has been developed focusing on flame retardants, fires and the environment. The diversity of the papers illustrates that the topic is extremely broad and that flame retardants can be, and are, used to modify the fire performance of all flammable materials, both plastics as discussed in the applications by Blais and Carpenter [3, 4] and Melamed et al. [5], and natural material such as wood by Nikolaeva and Kärki [6]. While the focus of the debate has been on the broad introduction of plastics into our homes in modern time and flame retardant additives used to enhance their fire performance, it is clear that other applications of flame retardants to foster increased fire safety are widespread.

While numerous articles are presented every year on new flame retardant technologies in different materials or products there is a clear need for objective approaches to analyze the environmental impact of these materials and their additives, which takes into account the environmental impact of fires. Numerous applications of a holistic life-cycle assessment model have been made previously [see for example reference 7]. Following on this previous work, an improved cost-benefit analysis is presented in Simonson-McNamee and Anderson [8], containing a quantitative comparison of different risks, e.g. that of environmental exposure to the chemical flame retardant compared to the risk of exposure to a fire.

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Human exposure can be considered both in terms of what typical consumers experience through the presence of flame retarded products in their homes and what fire fighters experience through exposure while working on fire scenes, both during and after the fire incident. These issues are considered by Webster et al. [9].

Clearly, more work is necessary to include the impact of flame retardants on people and the environment. In many of the papers presented each year on the performance of new formulations, chemical exposure risks to people and the environment are not broached at all. It is my hope that this issue of Fire Technology, while disparate in the subject of the various articles, will prompt increase consideration of these important topics and that future issues can continue to foster an open dialogue in support of all aspects of safety.

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