

SAFE AND SUSTAINABLE BY DESIGN (SSBD)



Webinar slides and video online here:
<https://www.pinfa.eu/presentation/what-does-product-sustainability-mean-for-tomorrows-fire-safety/>



Product sustainability and fire safety

pinfa's webinar, with 140 participants confirms that EU Green Deal sustainability initiatives will strongly impact fire safety. Participants represented a wide range of industries, including chemicals, plastics, energy, transports, construction, as well as researchers and fire safety experts. Discussions emphasised the challenges of addressing new fire safety challenges, such as batteries, composite materials and changing lifestyles, whilst ensuring sustainable, safe and recyclable flame retardant materials and consumer products.

Online consultations of webinar participants showed that a very large majority consider that Green Deal policies and the new EU Chemicals Strategy will significantly impact choices in flame retardant chemistry. "**No-hazard**", "**low-toxic**", "**recyclable**" and "**environmentally friendly**" showed as shared keywords.

Sustainability means beyond no-hazard

The panel discussion underlined that sustainability is not just about hazard, but also about different chemistries, carbon footprint, recycling and social impacts. Key questions are how to structure standardised and comparable information on chemical sustainability, beyond only hazards, and how to communicate all important environmental information down the value chain, including in final consumer products, whilst respecting confidential commercial information on formulations.



Sylvie Lemoine, Executive Director, Cefic Product Stewardship, explained that the EU Green Deal targets, among others, energy and climate change, Critical Raw Materials, recycling and the “zero pollution” ambition. The Chemicals Strategy for Sustainability means a step-change for chemicals, with a new legislation system, with 56 legislative actions planned. This has the full political support of Member States and the European Parliament, underpinned by surveys which show that 90% of the public are worried about the environmental impacts of chemicals, and 84% about health impacts. The Commission’s aim, shared by Cefic, is that the EU becomes the world benchmark for safe and sustainable chemicals.

The Chemicals Strategy focuses on hazards and generic restrictions, in order to address problematic chemicals faster (current Risk Assessment processes are considered too slow) and to ensure preventative regulation before certain chemicals reach the environment.

One key concept is “Essential Use” which aims to ban the most hazardous chemicals and families of chemicals except in applications which are necessary for society and for which alternatives are not possible.

A second key concept is “Sustainable and Safe by Design” (SSbD). Work is already underway to define standard criteria, see details in pinfa Newsletter n° 127, with the aim of harmonising sustainability assessments.



Margaret McNamee, Professor of Fire Safety Engineering at Lund University, Sweden and International Association for Fire Safety Science (IAFSS), underlined that fire remains a societal problem, with 180 000 to 300 000 fire deaths annually worldwide, and 3 500 deaths and 70 000 fire injuries per year in Europe. Before Covid, fire was responsible for 60% of business interruptions worldwide.

Fire also has important environmental impacts: locally with smoke, soot and toxic gases, and globally in terms of life cycle impacts associated with fire response and replacement of lost and damaged products and materials.

Fire safety is closely linked to societal challenges such as climate change (e.g. wildfires, fire risks of green buildings or energies ...), information technology, ageing population, urbanisation and linking fire safety and sustainability is essential.

See “IAFSS agenda 2030 for a fire safe world”, M. McNamee et al., *Fire Safety Journal* 110 (2019) 102889 <https://doi.org/10.1016/j.firesaf.2019.102889>

A panel discussion brought together experts from OEMs (product manufacturers), the plastics industry, the environmental sector and science.

Stefan Kienzle, Senior Executive & Former Director of Advanced Engineering at Daimler AG, indicated that 5 to 8 minutes pass between a fire starting in a vehicle and it becoming disastrous. Further time is needed to ensure a safety window and possibility of rescue. Materials must therefore avoid fire ignition, delay fire development and not hinder fire management (e.g. low smoke).

Battery and hydrogen technologies bring new fire protection challenges and conditions for firefighters. Chemistries are needed which can be included in batteries to reduce fire risks.

Laurent Tribut, technical expert at Schneider Electric, explained that the company's sustainability and eco-design approach means to use chemical additives only where necessary, looking for safer flame retardants, moving to non-halogenated chemicals and materials as well as addressing end-of-life. Simpler material formulations, e.g. without synergists, may be easier to recycle.

Schneider Electric questions how to identify which non-halogenated flame retardants are more sustainable in the absence of standardised criteria, beyond GreenScreen™ which is useful but limited to hazards. Better information is needed on synergists often used in FR packages. Also, recovery of flame retardants from end-of-life materials should be addressed.

Joachim Stricker, Radici, indicated that the company needs to ensure environmental assessment of materials supplied to industries such as electronics and automobile. This must today address not only chemical hazards, but more widely eco-design. Certifications are needed for the different primary materials and chemicals used, but also today for secondary recycled materials, covering mechanical and fire performance, but also environment and chemical safety.

Michel Cassart, Director Strategic Council Sustainable Use of Plastics, Plastics Europe, indicated that priorities for the plastics industry are low and circular carbon plastics production, safe and sustainable use of plastics and valorisation of plastic wastes. Plastics additives, including flame retardants, should offer low toxicity exposure and be compatible with plastics recycling.

Jacob de Boer, Professor of Environmental Chemistry and Toxicology, Vrije Universiteit Amsterdam, suggested that the most important environment and health development for chemicals today remains "no halogens", that is to phase out halogenated chemicals as a whole group. For example, the EU is at last now moving to ban PFAS (a wide family of fluorinated chemicals). We now have a legacy of repeated regrettable substitution of one halogenated chemical by a similar alternative, which then also proves to be problematic. An alternative would be to propose a limited list of halogenated substances which have been proven to be safe, but this is not the case today.

Lauren Heine, Director of Science & Data Integrity, Cofounder, ChemFORWARD, also underlined that sustainability is about inherent hazard and more. It should also address chemistry, carbon footprint, recycling, and social aspects. Sustainable fire safety may include the use of flame retardants, but it may be even more effective by using inherently non-flammable materials and adaptation of living styles and buildings.



Bringing users needed chemical information

Need for better information on chemical sustainability through the materials supply chain. Questions and panellists underlined the need to improve information on flame retardants and materials and its availability to downstream users and product manufacturers.

Michel Cassart, Plastics Europe, underlined the need to increase transparency about additives used in plastics, for example with a 'digital passport'. The challenges are to ensure Commercial Business Information on formulations and compounders' know-how, to avoid information overload and keep information accessible and understandable for downstream user industries and consumers.

Lauren Heine, ChemFORWARD, considers that flame retardant hazard assessment needs better transparency, updating and agreement on conclusions, open to challenge by scientists. Product manufacturers want centralised access and harmonised information on chemicals. The challenge is how to integrate such data bases into supply chains and market tools.



Adrian Beard, pinfa Chairperson and Clariant, summarised the webinar discussions, concluding that there is strong agreement that the Green Deal concept of Sustainable and Safe by Design will considerably impact flame retardant chemical portfolios. Industry needs to work with scientists, NGOs and regulators to develop standardised sustainability assessment metrics, to improve transparency of data (both on chemical hazard and on wider sustainability criteria, in particular recycling) and to find new ways to ensure communication to the value chain and the consumer

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