

The excessive and unnecessary use of harmful chemical flame retardants in UK furniture and furnishing products is a threat to human and environmental health and paradoxically contributes to domestic fire victim and firefighter mortality rates by exacerbating smoke toxicity. Continued use of chemicals of concern in materials, with no chemical traceability through furniture supply chains, also restricts recycling and reuse initiatives, undermining the operation of a safe circular economy.

Fidra asks that the UK Government:

- Use the ‘**Smarter Regulation: Consultation on the new approach to the fire safety of domestic upholstered furniture**’¹ and subsequent review process as an opportunity to modernise the UK Furniture and Furnishings (Fire) (Safety) Regulations (FFRs) 1988 and reduce reliance on harmful chemicals.
- Provide real-scenario flammability testing standards to ensure effective and sustainable fire safety without need for harmful chemical flame retardants in furniture products.
- Mandate chemical labelling and sound chemical management practices, ensuring that consumers, manufacturers, retailers, recyclers and waste operators have information on chemical flame retardants when still used in furniture products and materials.
- Drive innovation towards safe and sustainable furniture product design that does not rely on harmful chemicals.

The current approach to fire safety for furniture and furnishings in the UK is ineffective and is contributing to the global chemical pollution crisis². Chemical flame retardants can make up 2-30% of the weight of treated furniture materials³, limiting reuse and recycling opportunities and placing an unnecessary chemical burden on public and environmental health.

Chemical flame retardants used in our furniture are now ubiquitous in our indoor and outdoor environments and contribute to the globally significant flame-retardant exposure rates recorded

amongst the UK public^{2,4,5}. They have also been found to exacerbate fire smoke toxicity, the largest cause of death from fires in the UK^{6,7}. By reducing reliance on chemical flame retardants to meet current fire safety standards, and by enforcing chemical transparency and traceability throughout furniture supply chains, we can ensure more effective and sustainable fire safety practises, minimise public and environmental exposure to substances of concern, and protect the circular economy from contamination with harmful chemicals.

Chemical flame retardants: A human and environmental health risk

Chemical flame retardants are designed to delay the onset of fire when consumer products come in contact with an ignition source. They are added to a wide range of everyday products from mattresses, sofas and building insulation to computers and other electronics. Chemical flame retardants are *intended* to save lives, but they aren’t always retained in products. **Chemical flame retardants migrate into house dust and indoor air, they settle on work surfaces, and they contaminate our indoor environments**². Multiple studies have highlighted young children and infants as particularly at risk of high exposure due to their proximity to the floor and hand-to-mouth behaviours, both of which increase the amount of contaminated dust they ingest and inhale. Once in our bodies, flame retardants have been linked to a wide range of human health concerns from behavioural and developmental problems to increased propensity to certain cancers, hormone disruption and neurotoxicity⁵.

These chemicals are also impacting our wider environment. **Chemicals initially added to consumer products as flame retardants have now been recorded in wildlife across the globe**². Some

persistent flame-retardant chemicals are known to bioaccumulate through food chains, with dose and consequently risk of harm highest in top predators, such as the UK’s iconic orcas and otters³. Both heavily restricted legacy chemicals and newer replacement chemicals of concern can travel thousands of miles away from where they originate via air, water and migratory animals³. **Flame retardants, legacy and current, therefore present**

“Flame retardants are ubiquitous environmental chemical pollutants and are present in rivers, lakes, sediments, soil, air, mammals, birds, and fish throughout the world”⁵.

a significant and global risk to already vulnerable wildlife populations and the natural environment.

Chemical Flame Retardants in UK Furniture: An opportunity to improve fire safety

Chemical flame retardants are designed to delay the onset of fire when a consumer product is in contact with an ignition source. But **evidence-informed policy and recognition of important limitations in the UK's current approach to fire safety is essential**⁸. Although the use of chemical flame retardants are not mandated, the current outdated

The total number of businesses affected by the Furniture and Furnishings Fire Safety Regulations is estimated to be around 21,000⁹

UK Furniture and Furnishings (Fire) (Safety) Regulations (FFRs) 1988 requires that all domestic furniture and furnishings meet flammability tests that do not reflect real world scenarios. The use of

chemical flame retardants is often the most cost-effective way for businesses to comply with the current regulations¹ and therefore the **UK is one of the highest users of chemical flame retardants in the world**⁵. Other countries with no or less

"Use of harmful chemicals, including chemical flame retardants, should be avoided wherever possible" - *Industry Consensus Statement, 2023*¹⁰

prescriptive furniture fire safety requirements have demonstrated similar declines in fire fatality trends as the UK, largely explained by the increased use of smoke detectors and decreases in smoking rates^{2,4,6}.

Upholstered furnishings are also not the primary cause of fire fatalities in UK homes. Upholstered furniture is rarely the main combustion source material responsible for fire development in UK domestic fires. Nor are upholstery fires a major cause of death⁶. Focussing on flammability test criteria for furniture and furnishings therefore misses the cause of real fire fatalities.

Chemical flame retardants exacerbate fire smoke toxicity

While they may act to slow the rate of burn, flame retardants also **increase the production of toxic gases, including carbon monoxide and hydrogen cyanide**^{6,7}. **Chemical flame retardants also cause smoke to become more opaque**, making it more difficult for residents to escape from burning buildings, and for firefighters to safely evacuate and extinguish the fire⁷. The leading cause of injury and fatalities in domestic fires is inhalation of toxic smoke and it is estimated to be responsible for ~ 40% of fire deaths⁶.

Mattress product circularity and innovation

Fidra have been working alongside representatives from across the UK mattress industry who are calling for effective and sustainable fire safety regulations without reliance on harmful chemical flame retardants. Highlights from Fidra's mattress case study outputs include:

1) **Fifteen UK mattress and wider furniture representatives are calling for new FFRs to support a reduction in chemical flame-retardant use, greater chemical transparency and traceability, and improved standards for chemical management within a circular economy – Industry Consensus Statement, September 2023**¹⁰.

2) **Use of chemical flame retardants threatens the safety of our circular economy and undermines recycling efforts – Evidence Review² and Stakeholder Analysis⁴.**

3) **Chemical traceability measures and Extended Producer Responsibility (EPR) schemes that incorporate chemical sustainability could improve mattress product circularity – Evidence Review², Stakeholder Analysis⁴, Industry Consensus Statement¹⁰ and Survey¹¹.**

4) **All survey participants agreed that the mattress industry would benefit from improved access to chemical information - Survey¹¹.**

Domestic seating POPs incineration ruling

Chemicals that were originally intended as **flame retardants are also increasingly found in secondary materials and recycled products, presenting a significant barrier for a circular economy**^{2,4}. Environmental regulators recently imposed a new ruling to incinerate waste upholstered domestic seating (WUDS) products found to contain chemical flame retardants that are now internationally restricted as persistent organic pollutants (POPs). Affected seating items can no longer be reused, recycled, or landfilled, presenting a significant challenge for waste management facilitators and local authorities, as well as a substantial loss of materials. Emerging evidence connecting alternative chemical flame retardants used in upholstered furniture items with similar human and environmental health effects demonstrates a significant and ongoing challenge for furniture and mattress recycling. **If we want to achieve a safe and successful circular economy, we must avoid the use of harmful chemicals wherever possible, and where they are still used, effective chemical transparency and traceability measures must be enforced.**

Solutions and wider benefits

The use of chemical flame retardants in UK furniture and furnishings offers little protection against domestic fires, and paradoxically may increase fire victim injury and mortality rates through exacerbated smoke toxicity. We can achieve improved fire safety by:

- Reducing reliance on chemical flame retardants
- Updating the current FFRs and flammability testing standards
- Including fire smoke toxicity within scope of the FFRs
- Mandating chemical transparency and traceability
- Incentivising measures that encourage innovation and intelligent furniture design

These workable solutions will support improved fire safety, consumer and environmental protection, and a successful circular economy for future generations^{2,4,5,6}. **More must be done to protect the UK public and environment from the growing impact of chemical pollution.**

Fidra recommends the UK government uses the opportunity to reform the current UK Furniture and Furnishings Fire Safety Regulations to support more effective and sustainable fire safety.

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