

Defra Study

Flame Retardant Technologies: safe products with optimised environmental performance

1. CONTEXT

The UK has some of the highest fire safety standards in the world. The role of flame retardant chemicals in enabling consumer products to fulfil these fire resistance requirements is well recognised. However, concerns have been raised about whether some flame retardant chemicals may present potential unacceptable risks to human health and the environment, and there have been various risk assessment studies on these aspects.

The aim of this project is to review the available technologies for achieving flame retardant properties in key product groups, and to determine best practice in terms of achieving appropriate safety standards with minimal environmental impact.

The project will not seek to undertake new risk assessment of particular flame retardant chemicals but should consider the balance of evidence alongside market information in reviewing the practical options for product manufacturers at the current time. It will seek to consider the merits and feasibility of alternative design approaches alongside the conventional chemical treatments.

This project outputs will be used to inform emerging product criteria such as for the high level EU Ecolabel scheme, and other standards such as public procurement specifications where the aim is to identify products which can be seen as leading in terms of their sustainability performance.

2. BACKGROUND

UK Policy Context

Sustainable Consumption and Production

This project has been commissioned under the Sustainable Consumption and Production (SCP) Evidence Programme.

Sustainable consumption and production refers to an economy where products and services are designed, produced, used and disposed of in ways that both:

- a. minimise carbon emissions, waste and the use of non-renewable resource;
- and
- b. support innovation, economic prosperity, and social benefits.

Achieving sustainable consumption and production requires a major shift to deliver improved products and services, business models and consumption patterns. The approach of the SCP programme is to drive improved products and services by reducing their effects on the environment throughout their supply chain (i.e. from raw materials to disposal). The programme builds on the growing awareness of social and environmental concerns, and the importance of their roles as citizens, businesses and consumers. The policy background on Sustainable Consumption and Production can be found at:

www.defra.gov.uk/environment/business/scp/index.htm.

Sustainable Product Policy

A range of policies are in place to improve the energy and environmental performance of products. In order to provide markets with information on best performing products, we need to establish benchmarks which represent a high level of sustainability performance for key products and sectors. Mandatory minimum requirements are also being set for certain products and sectors, and procurement policy is being used to encourage products to comply with increasing standards through the use of Green Public Procurement specifications in public purchasing. Periodic reviews are used to keep these benchmarks and standards current, in line with technological and regulatory change.

An example of this standard setting process in practice is the recent revision of EU Ecolabel criteria for bed mattresses and textiles, where criteria on flame retardants were considered alongside other aspects of these products' life cycles.

Fire safety

The Furniture and Furnishings (Fire) (Safety) Regulations 1988¹ (as amended in 1989 and 1993) set levels of fire resistance for domestic upholstered furniture, furnishings and other products containing upholstery.

From March 1987, new performance requirements regarding flammability of nightwear came into force. These are compulsory for children's nightdresses and dressing gowns. In addition, from November 2008, a new European standard for the flammability of children's nightwear comes into effect, which may be enforced under the General Product Safety Regulations 2005.

Chemicals legislation

- The Europe-wide REACH regime will require registration and evaluation of chemicals systematically, and chemicals deemed to be of most concern will require authorisation. However, the process of identifying substances of very high concern (SVHC) is just commencing. The current candidate list includes hexabromocyclododecane (HBCD), a flame retardant used in construction foams.
- Some flame retardant chemicals are already subject to EU wide bans (Polybrominated biphenyls, and Octa- and Penta-bromodiphenyl ethers).
- DecaBDE has been the subject of numerous risk assessments, and is excluded from electronic products under the ROHS Directive (an exemption was originally given for this substance but this was overturned in 2006 by the European Court of Justice).

3. PROJECT AIMS

Aims and Objectives

The aim of this project is to review the available technologies for achieving flame retardant properties in key product groups, and to determine best practice in terms of achieving appropriate safety standards with minimal environmental impact.

¹ <http://www.berr.gov.uk/files/file24685.pdf>

The objectives are to:

1. Provide a summary of the legislative landscape (including UK, EU and US developments, and covering both fire safety requirements and restrictions on substances used).
2. Provide a UK and EU market analysis to provide an insight into the key technologies currently used in different products in the UK and EU and emerging trends.
3. Undertake a review of latest scientific knowledge and risk assessment conclusions of the hazardous nature of flame retardants.
4. Undertake a review of alternative approaches to flame retardancy, including reactive technologies and physical barriers / use of naturally fire retardant materials, together with an indication of relative costs of the different approaches.
5. Provide a recommendation, for each key product group, of the fire retardancy approach with the best performance in terms of environmental impact. This will be accompanied by an assessment of the level to which this optimum approach is already employed by industry and, if applicable, the ease with which it could be taken up by the mass market and associated costs. Case studies will be used to illustrate this.
6. In the light of the study findings, review and comment will be made on the latest criteria set under the EU Ecolabel for the consumer products of interest.

Scope

Types of product: The study will focus on the following products:

1. Products covered by the Furniture and Furnishings (Fire) (Safety) Regulations 1988: "items which contain upholstery: beds, headboards, mattresses, sofa-beds, nursery furniture, garden furniture which can be used indoors, furniture in new caravans, scatter cushions, seat pads and pillows and loose and stretch covers for furniture".
2. Clothing textiles and nightwear
3. Consumer Electronics

Types of application: The study will consider both consumer products and commercial products (for example, furnishings for public use areas which may be subject to more stringent fire protection standards).

Types of FR technology: The study will consider all methods of achieving flame retardancy in products, including additive, reactive, barrier and other relevant technologies or design solutions. Where appropriate, brominated compounds will be considered alongside mineral and organophosphate based substances.

Geographical scope: The study will focus on the specific UK situation in terms of fire safety legislation but will take account of European and international (particularly US) technological developments and market trends, to determine leading technologies and best practice.

For Those Participating

Openness and Confidentiality

Defra looks forward to a number of private and public organisations and individuals participating in the study both through a web based survey and by direct contact. It is for individuals and organisations to decide if they wish to communicate confidential information as well as any information that they may have placed in the public domain.

Please note that Defra may be required to release information, including personal data and commercial information, on request under the Environmental Information Regulations 2004 or the Freedom of Information Act 2000. However, Defra will not permit any unwarranted breach of confidentiality nor will we act in contravention of our obligations under the Data Protection Act 1998.

If you believe that any information that you are providing is confidential, please mark it as such clearly and prominently, including mentioning it in a cover email or letter. Please note that a confidentiality marking on its own would not necessarily prevent disclosure: it is the content of the information (i.e. whether it is truly confidential) and whether any harm would be caused by disclosure that determines whether it should not be disclosed. Therefore, if you are supplying any confidential details, please explain why they are confidential and give details of any harm that you believe would be caused by disclosure.

We will take your reasons into account if someone asks for this information under freedom of information legislation. But, because of the law, we cannot promise that we will always be able to keep those details confidential. Please note, if your computer automatically includes a confidentiality disclaimer, that won't count as a confidentiality request.

Inviting Others to Participate

FR Producers are encouraged to invite their customers who are linked directly or indirectly to the products of interest to share in the survey. This may include product manufacturers as well as compounders and masterbatch producers who supply materials to both component and product manufacturers.

Similarly, Trade Associations are asked to actively engage their members by inviting those who manufacture products in the areas covered by the survey to participate in it.

The survey will contain instructions on how to invite another organisation to participate.

Study Contractor

The study is led by Professor Gary Stevens of GnoSys UK with the assistance of the University of Bolton and Oakdene Hollins. For more information please contact Linda Lim at l.lim@gnosysgroup.com.