The Facts Behind Misconceptions of Brominated Flame Retardants (BFRs)

Introduction

The purpose of this document is to outline some key facts for consideration when reporting on brominated flame retardants (BFRs).

Facts about Brominated Flame Retardants (BFRs)

Flame retardants protect us from fire

Fire statistics and tests demonstrate that a significant number of lives can be saved if flame retardants are used, especially in consumer products. Flame retardants make ignition less likely and limit the rate of fire growth. They have less benefit when fires become well established but can help reduce the intensity of the fires that occur. **There is therefore a proven benefit in the use of flame retardants in reducing the incidence and rate of development of fires**[1].

The 2009 Greenstreet Berman study, carried out by the UK government, showed that in the period between 2002 and 2007 the UK Furniture and Furnishings Fire Safety Regulations accounted for 54 fewer deaths per year, 780 fewer non-fatal casualties per year and 1065 fewer fires each year following the introduction of the UK furniture safety regulations in 1988[2].

One flame retardant does not represent the entire family

It is very difficult to attribute properties or findings from one small group or sub-group of substances to an entire family of chemical substances. Such is the case in the world of substances used as flame retardants.

The term "flame retardant" merely describes the function of a substance and not its chemical nature which determines the properties of the substance.

In fact, a wide range of different chemicals act as flame retardants, often applied in combination. This variety is necessary because the materials and products which need to be rendered fire-safe are very different in their nature, their composition – and indeed their application.

There are reactive, polymeric, halogenated, phosphorus, mineral and many others types of chemicals and chemistries used as flame retardants. Some flame retardants are well suited for certain uses, but totally ineffective or even detrimental in others.

Brominated flame retardants are safe for use in consumer products

Brominated flame retardants have been subjected to intensive assessment and have been identified as safe for use in consumer products. All flame retardants produced by BSEF member companies currently on the market have thoroughly been assessed by independent experts. In addition to this, all chemicals substances on the European market are regulated under REACH meaning that their potential environmental and human risks have been thoroughly assessed by scientists and regulators. BSEF is committed to fully cooperate with any state body on technical, regulatory and scientific challenges and address any concerns.

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[1] Stevens & Mann, "Risks and benefits in the use of flame retardants in consumer products" (1999), University of Surrey

[2] Greenstreet Berman Ltd., "A statistical report to investigate the effectiveness of the Furniture and Furnishings (Fire) (Safety) Regulations 1988", (December 2009). The study was carried out for the UK Department of Business and Innovation skills (BIS). http://www.bis.gov.uk/files/file54041.pdf .

Not all brominated flame retardants are POPs

Only one of the brominated flame retardants commercially available from the BSEF member companies is a Persistent Organic Pollutant (POP). The decision was recently taken to list Hexabromocyclododecane (HBCD) as a POP under the UNEP Stockholm Convention from late 2014[3].

To be a POP, a substance needs to meet the POP criteria of persistency, bioaccumulation, toxicity and long range transport. Brominated flame retardants are persistent; they have to be in order to perform their function of fire resistance over long periods of time. For example, the typical lifecycle for insulation foams inside buildings is more than 50 years.

The UNEP decision allows countries to enable the continued use of HBCD in polystyrene insulation foams in buildings only, until late 2019, in order to allow the market to transition to a more suitable alternative for this critical application.

Plastics with flame retardants can be recycled

When done in a proper manner, modern flame retardants are totally compatible with the model of reuse, recycle and recover. For example, studies have demonstrated that TBBPA[4] , the world's largest volume brominated flame retardant which is widely used to make the epoxy resins for printed wiring board (PWB) construction, is fully compatible with integrated waste management concepts used today to recover valuable metals from PWBs[5,6]. Because of its chemical structure, TBBPA has very low potential for formation of significant levels of dioxins/furans during recycling[7].

After being recycled, flame retardant-treated plastics used in electrical and electronic equipment meet the strictest EU requirements for incineration plants.

In cases when recycling of plastics containing brominated flame retardants are not possible, there is a range of eco-efficient waste management options available, including energy recovery.

The presence of flame retardants does not make fires more toxic

Dioxin formation may occur under certain conditions, but **other toxic gases** such as carbon monoxide hydrogen cyanide and polycyclic aromatic hydrocarbons, **which are not linked to the presence of flame retardants, are much more dangerous in the event of a fire**[8]. When wood burns there is also dioxin formation. As a matter of fact, wood burning is the third largest source of dioxin in the United States.[9]

Brominated Vegetable Oil (BVO) is not a flame retardant

Brominated vegetable oil (BVO) is a food additive and not a flame retardant. **BVO and flame retardants are totally different products**. BSEF is not aware of any current or past use of BVO as a flame retardant and certainly our member companies have never marketed BVO as a flame retardant.

Questions?

Please do not hesitate to contact Xanthe Visram on Xanthe.visram@bm.com or +32 (0) 478 840 386 with any questions you may have about this complex and beneficial family of products.

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[3] Decision taken by Conference of Parties at their 6th meeting on 9 May 2013. The final decision will be made available on the UNEP Stockholm Convention website here. See also BSEF Statement (3 May 2013)
[4] TBBPA is the main flame retardant used to improve fire safety of printed circuit boards in electrical and electronic equipment
[5] Boerrigter, H., "Implementation of thermal processes for feedstock recycling of bromine and antimony, with energy recovery, from plastics waste of electrical and electronic Equipment, Phase 1", Netherlands Energy Research Foundation (ECN), July 2000
[6] TBBPA's EU Risk Assessment and Mark, F.E., (Dow Europe), Lehner, T.,Plastic Recovery from Waste Electrical and Electronic Equipment in Non-Ferrous Metal Processes 2000
[7] Imai T., S. Hamm, K.P. Rothenbacher, Techno Polymer Co., Ltd "Comparison of the recyclability of flame-retarded plastics"; Environ Sci Technol. Feb 1;37(3):652-6;., 100 Kawajiri-cho, Yokkaichi, Mie 510-0871, Japan, 2003
[8] Blomqvist, Andersson and Simonson, "Fire Emissions from Products with and without BFRs and the Hazard of Exposure for Fire Fighters and Clean-up Crews", SP Technical Research Institute of Sweden
[9] Source: http://burningissues.org/dioxin.htm