FACT sheet

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Brominated Flame Retardant

Deca-BDE

Decabromodiphenyl Ether

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BSEF
Bromine Science and Environmental Forum

FACT sheet

Deca-BDE

Decabromodiphenyl Ether

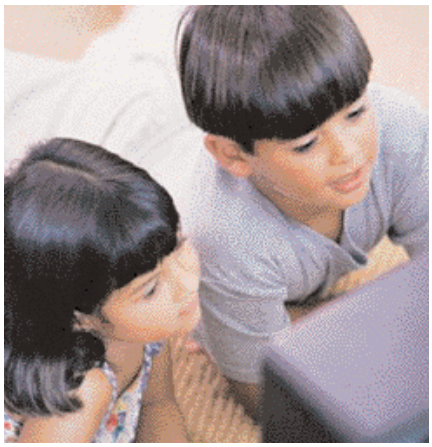
> Introduction

Deca-BDE is a Brominated Flame Retardant (BFR) used in many domestic and industrial appliances and equipment. It is highly effective in increasing resistance to fire and allows up to 15 times more time to escape when a fire occurs. Deca-BDE has been duly registered under REACH, while regulatory assessment on the substance is still ongoing.

> Applications and fire safety

Deca-BDE is used in plastics for electric and electronic equipment (E&E) (e.g. plastic housings of TV sets), in the transportation sector (e.g. automotive and aviation industries) and in construction and building (e.g. wires, cables, pipes). It is also used as a flame retardant in textiles to enable upholstered furniture to comply with fire safety standards for public places and buildings. The use of Deca-BDE ensures compliance with the most stringent fire safety requirements for home furniture in Ireland and the United Kingdom. Research has demonstrated that a 1988 UK legislation mandating that upholstered furniture be made with a high level of fire resistance resulted in 54 fewer deaths and 780 fewer non-fatal casualties per year[1]. In the United States, similar fire safety requirements exist in California.

Deca-BDE is one of the flame retardants with the most scientific data supporting its compatibility in terms of human health, environmental profile and its significant contribution to fire safety. It has been subject to more than 1,000 scientific studies around the globe to assess its potential effects. These concluded that Deca-BDE presents no significant risk for human health or the environment. Studies have shown that plastics made fire resistant with Deca-BDE maintain their mechanical properties as well as their flame retardant properties after many recycling steps. Plastics containing Deca-BDE can be safely recycled within the strictest European framework for allowed emissions set by national laws. This guarantees possible reuse of these valuable materials.



> BSEF Emissions Control Programme

VECAP (the Voluntary Emissions Control Action Programme) is a proactive product stewardship initiative established by the brominated flame retardant industry. The principles of the programme, as it stands today, were developed in cooperation with several EU Member States, the European Commission and the BFR Industry.

VECAP is designed to manage, monitor and minimise industrial emissions of chemicals to the environment, through a partnership with the supply chain. Through VECAP, manufacturers and users of chemicals work together to establish and share best practices on the handling of chemicals to reduce and prevent emissions to the environment.

As such, VECAP represents an advanced practice on the new EU legislation governing the management throughout the supply chain of chemicals in Europe, better known as REACH. REACH requires downstream users to have more information and prepare an assessment of the substances they use for their specific applications. VECAP provides industry with practical tools in this respect.

Initially, VECAP was set up in Europe for the flame retardant Deca-BDE after the finalisation of the EU risk assessment. While no risks were identified for Deca-BDE, European Authorities expressed their concern at the findings of very low levels of Deca-BDE in the environment close to industrial sites.

Since 2004, the implementation of VECAP for Deca-BDE has been very positive, thanks to user commitment to the programme.

Further information on VECAP can be found at: **www.vecap.info**

[1] "A Statistical report to investigate the effectiveness of the Furniture and Furnishings Fire Safety Regulations 1988", Department for Business, Innovation and Skills, December 2009

VECAP for Deca-BDE: 2010 status[2]

- In Belgium, France, Germany, Italy and UK the level of user commitment to VECAP for Deca-BDE has reached over 95% for textile industry users and over 80% for plastic industry users.
- In Canada and the US, 79% of Deca-BDE users have committed to VECAP.
- During the last years of VECAP implementation, , there has been an increased uptake of best practices. For example, when comparing the emissions in 2008 to those in 2009, the potential air emissions reduced by 10 kilograms to 32 kilograms. The potential water emissions have been reduced by 15 kilograms to 66 kilograms. The largest reduction was to be found in land potential emissions, where they were reduced to 1122 kilograms, only 0.02% of total use in Europe. This demonstrates a significant emission reduction when compared to the 3309 kilograms identified in the 2008 survey.

> Deca-BDE in Europe

In Europe Deca-BDE is allowed for use in all applications, except, since July 2008, in E&E equipment.

EU Risk Assessment

After 10 years of scientific research, both the environment and human health risk assessment reports were completed and published in the EU Official Journal in May 2008. The review of more than 1,000 scientific studies concluded there was no need for risk reduction measures. EU scientists also agreed that environmental findings of Deca-BDE in Europe should be addressed by the initiation of an environmental monitoring programme, a biomonitoring programme and a neurotoxicity study. These programmes are carried out under the supervision of the risk assessment authorities. The status of the three programmes is the following:

- Levels of Deca-BDE in the environment: a 10-year environmental monitoring study is being conducted and preliminary results indicate no overall increase in the level of Deca-BDE in the environment.
- Presence of Deca-BDE in humans: a 10 year biomonitoring study is being carried out which monitors the occurence of Deca-BDE in blood and breast milk. As of date, it is too early to draw any definitive conclusions about temporal trends.
- Neurotoxicity: a study has been concluded in 2009 and will be published by the end of 2010. The study concludes that Deca-BDE does not display developmental neurotoxicity effects, even at elevated levels.

REACH

REACH is the new European Regulation for the Registration, Evaluation, Authorisation and Restriction of Chemical substances. REACH entered into force on 1 June 2007. The aim of REACH is to improve the protection of human health and the environment through early identification of hazardous properties in chemical substances. In common with most other chemicals, Deca-BDE is being registered under REACH. Since commercial Deca-BDE has already been subject to advanced testing under the EU Risk Assessments process, the dossier preparation required under REACH has, in large part, already been carried out.

A latest review by the EU REACH competent authorities (CARACAL) in February 2010 discussed ongoing scientific studies and progress on the EU's 10-year monitoring programmes. Based on findings at trace levels of a marker congener for the first time in a few samples, EU Member States had a discussion on the potential for exploring further risk management option to be applied to Deca-BDE.

The UK consulted its scientific committee (the Advisory Committee on Hazardous Substances - ACHS), to consider whether Deca-BDE meets the criteria for classification as a Substance of Equivalent Concern (SEC). In the absence of quantitative evidence denoting a risk from Deca-BDE or its degradation products to the environment, the ACHS has recommended to the UK regulatory agencies to consider whether Deca-BDE can be put forward as a candidate Substance of Equivalent Concern under the EU's REACH Regulation.

EU Directive on the Restriction of the use of certain Hazardous Substances in E&E Equipment (RoHS)[3]

The RoHS Directive restricts hazardous substances from E&E, including PBBs and PBDEs. Deca-BDE was first exempted from the RoHS Directive on 15 October 2005, on the basis of the conclusions of an EU Risk Assessment, and of the VECAP. Since July 2008, Deca-BDE is restricted for use in Europe in E&E applications while it is allowed for use in all other applications such as textile, automotives and constructions. Industry users could apply for temporary exemptions for certain applications under the procedure laid out in article 5 of the Directive.

[2] For further information please consult the fourth VECAP annual progress report 2009

[3] DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL - 27 January 2003 - on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Norway

On 1 April 2008, a unilateral Norwegian ban of Deca-BDE took effect. The ban covers the production, import, export, use and the placing on the market of Deca-BDE, as well as preparations and products containing 0.1% by weight of Deca-BDE used in textiles, furniture and insulation. Applications in the transport sector are not covered by the rules. This unilateral action was taken by the Norwegian Government despite EU chemicals legislation, also applicable in Norway on the basis of the European Economic Area Agreement. This measure was opposed by the European Commission, the EFTA Surveillance Authority, a number of WTO partners, as well as Norwegian and European industry.

> Deca-BDE in Asia

The use of Deca-BDE is not subject to any regulatory restrictions in Asia. Both the Chinese and Korean RoHS type regulations have exempted Deca-BDE from their lists of restricted substances for use in E&E equipment. The Chinese RoHS is currently under review. Such exemption is likely to continue.

In Japan, under the Chemical Substances Control Law, the annual production or import volumes of Deca-BDE has to be reported along with its uses. Under Japanese PRTR Law annual volume of Deca-BDE received, consumed, transferred, disposed as waste and released into the environment has to be reported by certain businesses to local government. It also limits obligation of reporting to 24 kinds of business sector and having not less than 21 employees.

> Deca-BDE in North America

On a voluntary basis, and in cooperation with the U.S. Environmental Protection Agency, each of the BSEF member companies has decided to phase out the production and use of Deca-BDE in the US market by the end of 2012, with an additional year allowed for specific applications (e.g., transportation, military).

At the state level, through the end of 2009, four US states passed limited prohibitions on certain uses of Deca-BDE. Those states are:

- Maine (prohibits use in residential mattresses, mattress pads, and textiles for residential furniture beginning in 2008 extended to the casings of televisions and computers beginning in 2010; exempts use in automotive, transportation and electrical).
- Oregon (prohibits use of Deca-BDE in any product at levels greater than one-tenth of one percent by weight).
- Vermont (prohibits use of Deca-BDE in mattresses, mattress pads and upholstered furniture beginning in 2010, and in the casings of televisions beginning in 2012; exempts use in automotive, transportation and electrical).
- Washington (initially prohibited use residential mattresses; in December 2008, state identified phosphorus-based flame retardant know as RDP as a "safer" alternative to Deca-BDE, and prohibition on use of Deca-BDE was extended to televisions, computers and residential upholstered furniture beginning Jan. 1, 2011; exempts Deca-BDE use in automotive, transportation and some electrical).
- Other US states also have on-going studies monitoring the use of Deca-BDE.
- In Canada, BSEF and its member companies are working closely with the Government of Canada, through Environment Canada and Health Canada, to assist in better understanding the importance of flame retardants and their applications. Recently, the member companies of BSEF individually committed to voluntarily withdraw sales and imports of DecaBDE into Canada by the end of 2013. This replaces an earlier agreement with Canadian authorities to monitor DecaBDE and implement an emissions reduction program in line with the industry's Voluntary Emissions Control Action Program.
- The federal government has been working on a comprehensive risk management strategy for all PBDEs since 2006. On August 28th Environment Canada released an updated Ecological State of Science Report for decaBDE, as well as an update draft Risk Management Strategy for PBDEs. The State of Science Report reaffirmed need to manage all 7 PBDEs under the Canada Environmental Protection Act. BSEF has cooperated with the Canadian authorities in the preparation of their State of the Science Report on Deca-BDE. BSEF does not agree with all the conclusions, in particular those drawn around the potential risk presented by debromination, and is committed to continue dialogue with Environment Canada and Health Canada through a formal consultation that will extend into early 2011.
- Consultations will continue leading to the publication of final regulatory controls, targeted for adoption in 2013, to coincide with member companies' withdrawal from the DecaBDE market in Canada.

For further information on Brominated Flame Retardants, please visit:

www.bsef.com

BSEF is the international organisation of the bromine chemical industry, whose remit is to inform stakeholders and commission science on brominated chemicals such as flame retardants

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