HBCD has undergone an EU Risk Assessment (RA) for environment and human health. The Swedish government was assigned as the lead (rapporteur). The RA was initiated in 1996 and was finalised in May 2008. The RA conclusions identified no risk to consumers. Furthermore, no risk was found for workers when standard industrial hygiene measures are applied (current EU practice).

The RA concluded that HBCD has PBT properties, due to the concern linked to the increase of environmental concentrations in past years.

Due to the identification of several specific risks to the aquatic environment, HBCD was classified as R50/53.

Given the risks identified for the environment, HBCD producers and users are committed to ensure a responsible use of HBCD and launched voluntary programmes aiming at controlling and reducing emissions into the environment.

For waste management, an independent study demonstrates that HBCD is fully compatible with integrated waste management technologies such as incineration.

HBCD's main use is in Expanded and Extruded Polystyrene (EPS and XPS) insulation foam boards which are widely used by the construction sector.

EPS and XPS insulation foams play a key contribution in helping governments to meet a significant part of global, regional and national energy efficiency targets.

In Europe, PS insulation foams are indispensable for the implementation of the EU Directive on energy performance in buildings (2002/91/EC).

HBCD provides a high degree of flame retardancy when used at very low concentrations.

HBCD has currently no technically and commercially feasible alternative for EPS and XPS applications despite intensive research.

EPS and XPS foams are processed to meet stringent fire safety regulations. The use of flame retarded EPS and XPS insulation foams is essential for achieving these standards in construction.

HBCD has currently no technically and commercially feasible alternative for EPS and XPS applications despite intensive research.

EPS and XPS foams are processed to meet stringent fire safety regulations. The use of flame retarded EPS and XPS insulation foams is essential for achieving these standards in construction.

HBCD has currently no technically and commercially feasible alternative for EPS and XPS applications despite intensive research.

HBCD is also applied in the back-coating of textiles, mainly for upholstered furniture.

It is one of the flame retardant technologies used to meet the highest levels of fire safety required by legislation for furniture and other textile applications in public places in several EU Member States.

A minor application of HBCD is in HIPS which is used in electrical and electronic equipment and appliances (e.g. audio visual equipment).
The regulatory status

HBCD IN EUROPE

As of June 2008, HBCD has entered a screening procedure under the new legislation REACH9.

In this context, the ECHA10’s Member States Committee11 agreed to include HBCD in the candidate list for Authorisation12 under REACH. This decision follows a proposal12 presented by the Swedish Chemicals Agency (KemI) identifying HBCD as a substance of very high concern (SVHC) and based on the Risk Assessment Report which concluded that HBCD is a PBT14 substance.

HBCD IN JAPAN

The Law Concerning the Examination and Regulation of Manufacture of Chemical Substances (the Chemical Substances Control Law - CSCL) adopted in the 1970s aims to control and manage the environmental risks posed by any chemicals produced in Japan or imported.

Under the CSCL, HBCD is vPvB (not PB) and classified as a Type I Monitoring Chemical Substances since April 2004. Such classification requires mandatory reporting to the national authorities of actual quantities of manufacturing, import and uses and, if a certain potential for risk is presented according to preliminary toxicity evaluation by the government, guidance and advice shall be given to businesses on measures for risk reduction to minimise release into the environment.

Studies carried out by the Japanese Environment Ministry in the CSCL framework demonstrate that HBCD emissions are controlled effectively in the EPS and XPS sector. As tests in textiles manufacturing identified potential concern on emissions, the flame retardant industry (FRCJ) established an emission control programme in co-operation with the supply chain (i.e. finishers and home textile manufacturers - NIF).

In Japan, each step of VECA is reported to the Ministry of Economy, trade and industry (METI) to ensure that CSCL requirements are met. A similar programme was launched in the EPS and XPS sector in early 2006.

HBCD IN NORTH AMERICA

In the US, a National Academy of Sciences’ toxicological study concluded that HBCD was one of the 8 substances that could be used as flame retardant in upholstered furniture to meet the Californian flammability standards15.

Furthermore, the US Environmental Protection Agency has launched a review of HBCD that should be finalised in 2012.

In Canada, a risk assessment of HBCD is ongoing and a final draft is expected to be published in 2009.

11 The European Chemicals Agency (ECHA) is in charge of managing the registration, evaluation, authorisation and restriction processes for chemical substances to ensure consistency across the European Union.
12 According to Regulation (EC) 1907/2006, one of the primary tasks of the Member State Committee is to seek agreement on the identification of substances to be included on the candidate list for eventual inclusion in Annex XV (list of substances subject to Authorisation) (Art. 59(7-8)).
13 REACH Annex XM
14 Annex XV Dossier
15 See note 5
16 Any producer or importer of articles has to notify ECHA if their article contains a substance on the Candidate List. This obligation applies if the substance is present above 0.1% (w/w) and its quantities in the produced/imported articles are above 1 tonne in total per year per company.
17 The European Economic Area (EEA) unites the 27 EU Member States and the three EEA EFTA States (Iceland, Liechtenstein, and Norway) into an Internal Market governed by the same basic rules.
HBCD producers and users are committed to control and reduce emissions both at production site and downstream users’ level.

Since 2006, the use of HBCD is covered by two voluntary emission management programmes.

- VECAP\textsuperscript{18}, is addressed to producers and downstream users. The programme involves the possibility of a certification procedure based on principles that are equivalent to those in ISO 9001 and 14001.
- SECURE\textsuperscript{19} is addressed to downstream users in the EPS and XPS sector.

Within the context of these programmes, a “Code of Good Practice” was developed to support users in their effort to reduce emissions, including advice on the best ways to store, handle and use products and waste.

**Voluntary programmes implemented at the sole production plant in Europe**

- HBCD is produced in one European plant which is located in the Netherlands. Under the framework of VECAP this HBCD production plant has developed methods and use state of the art technology to control air, water and solid waste emissions:
  - Air emissions from production units are captured by a dust filter and catalytic burner.
  - Wastewater from the production process is treated at the plant by an advanced wastewater treatment facility including filtration, active carbon treatment and bio membrane reactor, resulting in effluents that can be safely discharged.
  - Organic waste is treated on site in a state-of-the-art hazard waste incinerator specially designed for high bromine content waste. This process allows the plant to recover bromine from all waste and reuse it for production of HBCD.
  - These measures have resulted in a reduction in 2008 of total HBCD emissions to less than 2 kg per year, a negligible quantity.

- The plant has been audited and certified under VECAP in 2009.

**Voluntary programmes implemented for HBCD downstream users**

SECURE (Self Enforced Control of Use to Reduce Emissions) for EPS and XPS insulation foams applications.

In 2006, the bromine industry together with EPS and XPS insulation foams producers (PlasticsEurope and EXIBA\textsuperscript{20}) committed to reduce emissions to the environment through a voluntary emissions reduction programme, SECURE.

PlasticsEurope and EXIBA members that committed to SECURE represent 95% of the total HBCD consumption of PlasticsEurope and EXIBA.

**VECAP (Voluntary Emissions Control Action Programme) for textile applications**

In 2004, the BSEF member companies launched VECAP for DecaBDE in order to manage, monitor and minimise industrial emissions into the environment through a partnership with the supply chain including Small and Medium-sized Enterprises (SMEs)\textsuperscript{21}.

In 2006, VECAP was extended to HBCD emissions from the textiles sector in Europe. Since then, HBCD users representing more than 87% of the HBCD volume supplied by BSEF member companies to the textiles sector in the EU signed up to VECAP.

**Challenges ahead**

Industry’s aim is to ensure that all European users of HBCD are covered by VECAP or SECURE.

Both SECURE and VECAP are based on the continuous improvement principle. As such, actions are undertaken to identify sources of emissions and share best practices to minimise HBCD losses in plant. For example, residues in empty bags have been identified as a possible source of emission and consequently a best available technology for emptying bags was developed and communicated to downstream users\textsuperscript{22}.

---

\textsuperscript{18} Voluntary Emissions Control Action Programme: www.vecap.info
\textsuperscript{19} Self Enforced Control of Use to Reduce Emissions
\textsuperscript{20} PlasticsEurope (www.plasticseurope.org) and EXIBA (www.exiba.org) are CEFIC sector Groups.
\textsuperscript{21} Further information including the VECAP Annual Progress Reports is available at www.vecap.info.
\textsuperscript{22} See factsheet on “Best Available Technique for Emptying Bags containing BFRs” available at www.bsef.com.