

Annex F Questionnaire (one per chemical)

Chemical name (as used by the POPs Review Committee (POPRC))	Commercial pentabromodiphenyl ether (C-PentaBDE) referring to mixtures of bromodiphenyl ether congeners in which the main components are: <ul style="list-style-type: none"> - 2,2', 4,4'- tetrabromodiphenyl ether (BDE-47 CAS No. 40088-47-9); and - 2,2',4,4',5 pentabromodiphenyl ether (BDE-99 CAS No. 32534-81-9).
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Explanatory note:

- This chemical is undergoing a risk management evaluation. It has already satisfied the screening criteria set out in paragraph 4 (a) of Article 8 of the Convention. A risk profile has also been completed for this chemical in accordance with paragraph 6 of Article 8 and with Annex E to the Convention.

Introductory information	
Name of the submitting Party/observer	Bromine Science and Environmental Forum (BSEF) www.bsef.com
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Date of submission	9 February 2007

Additional Annex E information	
(i) Production data, including quantity and location	Since 2004, none of the BSEF members produce c-PentaBDE any longer. On total market, demand for c-PentaBDE was: 8,500 metric tons 1999 ; and 7,500 metric tons in 2001. Additional data is available at: www.bsef.com According to the EU Risk Assessment Report (p.24), c-PentaBDE was in the

	past produced in Israel, Japan, US and the EU. However since the late 1990's it is believed to have been produced primarily in the US although there are some indications that China may have produced for their market as well.
(ii) Uses	C-PentaBDE, when produced, was primarily used as a flame retardant for flexible polyurethane (PU) foam in furniture mainly for the US market. Other uses that have appeared in the literature and discussed in the EU risk assessment and elsewhere but these were all minor volumes in relation to use in PU foam.
(iii) Releases, such as discharges, losses and emissions	The EU Risk Assessment ¹ indicates emissions in polyurethane production are assumed to occur prior to the foaming process when handling the additives (discharges to water) and during the curing (emissions to air). ¹ Available at: http://ecb.jrc.it/DOCUMENTS/Existing-Chemicals/RISK_ASSESSMENT/REPORT/decabromodiphenyletherreport013.pdf

Explanatory note:

- This information was requested for preparation of the risk profile in accordance with Annex E of the Convention. The POPRC would like to collect more information on these items. If you have additional or updated information, kindly provide it.

A. Efficacy and efficiency of possible control measures in meeting risk reduction goals (provide summary information and relevant references):	
(i) Describe possible control measures	-
(ii) Technical feasibility	-
(iii) Costs, including environmental and health costs	-

Explanatory notes:

- If relevant, provide information on uses for which there may be no suitable alternative or for which the analysis of socio-economic factors justify the inclusion of an exemption when considering listing decisions under the Convention. Detail the negative impacts on society that could result if no exemption were permitted.
- “Risk reduction goals” could refer to targets or goals to reduce or eliminate releases from intentional production and use, unintentional production, stockpiles, wastes, and to reduce or avoid risks associated with long-range environment transport.
- Provide the costs and benefits of implementing the control measure, including environmental and health costs and benefits.
- Where relevant and possible “costs” should be expressed in US dollars per year.

B. Alternatives (products and processes) (provide summary information and relevant references):	
(i) Describe alternatives	<p>The EU Risk reduction strategy for c-PentaBDE identified tetrabromobenzoate (TBBE) and chlorinated alkyl phosphate esters, tri (2-chloroisopropyl) phosphate (TCPP) in particular, followed by phosphate esters as relevant alternatives to c-PentaBDE.</p> <p>In the US, a number of flame retardants were examined for possible use in home furnishing by the Furniture Flame Retardancy Partnership under the US EPA. The majority of the substances were for textile treatment and not uses in foam (where c-PentaBDE has been used).</p> <p>Some chemical alternatives to PU foam used in niche markets identified by the US EPA are proven not to be generally proven technological substitutes: their use either results in high scrap rates due to damage/discoloration of the foam or poor physical and flame retardancy performance over the life cycle of the foam. Many of the existing options are available only as solids, which requires extensive retrofitting and reconfiguration of the foam making process. In some cases these changes can have significant effects on foam quality or cost-effectiveness to manufacture.</p>
(ii) Technical feasibility	With the discontinuation of the use of c-PentaBDE and final cease, BSEF members have been actively developing and identifying alternatives.
(iii) Costs, including environmental and health costs	-
(iv) Efficacy	-
(v) Risk	The chlorinated phosphate esters are currently in review under the EU Risk Assessment of Existing Chemicals. The most current drafts should be consulted for the latest view on risk to human health or the environment.
(vi) Availability	-
(vii) Accessibility	-

Explanatory notes:

7. Provide a brief description of the alternative product or process and, if appropriate, the sector(s), use(s) or user(s) for which it would be relevant.
8. If several alternatives could be envisaged for the chemical under consideration, including non-chemical alternatives, provide information under this section for each alternative.
9. Specify for each proposed alternative whether it has actually been implemented (and give details), whether it has only reached the trial stage (again, with details) or whether it is just a proposal.
10. The evaluation of the efficacy should include any information on the performance, benefits, costs, and limitations of potential alternatives.
11. Specify if the information provided is connected to the specific needs and circumstances of developing countries.
12. The evaluation of the risk of the alternative should include any information on whether the proposed alternative has been thoroughly tested or evaluated in order to avoid inadvertently increasing risks to human health and the environment. The evaluation

should include any information on potential risks associated with untested alternatives and any increased risk over the life-cycle of the alternative, including manufacture, distribution, use, maintenance and disposal.

13. If the alternative has not been tried or tested, information on projected impacts may also be useful.
14. Information or comments on improving the availability and accessibility of alternatives may also be useful.

C. Positive and/or negative impacts on society of implementing possible control measures (provide summary information and relevant references):	
(i) Health, including public, environmental and occupational health	No occupational exposure since production ceased.
(ii) Agriculture, including aquaculture and forestry	-
(iii) Biota (biodiversity)	-
(iv) Economic aspects	-
(v) Movement towards sustainable development	-
(vi) Social costs	-

Explanatory notes:

15. Socio-economic considerations could include:
 - Any information on the impact (if any), costs and benefits to the local, national and regional economy, including the manufacturing sector and industrial and other users (e.g., capital costs and benefits associated with the transition to the alternatives); and impacts on agriculture and forestry;
 - Any information on the impact (if any) on the wider society, associated with the transition to alternatives, including the negative and positive impacts on public, environmental, and occupational health. Consideration should also be given to the positive and negative impacts on the natural environment and biodiversity.
 - Information should be provided on how control measures fit within national sustainable development strategies and plans.

D. Waste and disposal implications (in particular, obsolete stocks of pesticides and clean-up of contaminated sites) (provide summary information and relevant references):	
(i) Technical feasibility	-
(ii) Costs	-

Explanatory note:

16. Specify if the information provided is connected to the specific needs and circumstances of developing countries

E. Access to information and public education (provide summary information and relevant references):

- The EU risk assessment includes all relevant data. It can be found at: http://ecb.jrc.it/DOCUMENTS/Existing-Chemicals/RISK_ASSESSMENT/REPORT/decabromodiphenyletherreport013.pdf
- US EPA “Furniture Flame Retardancy Partnership,” can be found at: <http://www.epa.gov/dfe/pubs/projects/flameret/index.htm>
- For access to information about relevant regulatory acts and scientific studies please refer to www.bsef.com

Explanatory note:

17. Please provide details here of access to information and public education with respect to both control measures and alternatives.

F. Status of control and monitoring capacity (provide summary information and relevant references):

All developed countries have in place all monitoring and control capacities as well as legislative tools to restrict the use of c-PentaBDE.

Explanatory note:

18. With regard to control capacity, the information required is on legislative and institutional frameworks for the chemical under consideration and their enforcement. With regard to monitoring capacity, the information required is on the technical and institutional infrastructure for the environmental monitoring and biomonitoring of the chemical under consideration, not monitoring capacity for alternatives.

G. Any national or regional control actions already taken, including information on alternatives, and other relevant risk management information:

In the EU, c-PentaBDE is restricted under the following:

- Directive 2003/11/EC of the European Parliament and of the Council of 6 February 2003 amending for the 24th time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (pentabromodiphenyl ether, octabromodiphenyl ether) (http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_042/l_04220030215en00450046.pdf)
- Directive 2002/95/EC of the European Parliament and the Council of the European Union of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS Directive) (http://europa.eu.int/eur-lex/pri/fr/oj/dat/2003/l_037/l_03720030213fr00190023.pdf)
- Directive 2002/96/EC Of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) (http://europa.eu.int/eur-lex/pri/en/oj/dat/2003/l_037/l_03720030213en00240038.pdf)

In the US, Industry voluntarily ceased production in 2004, since then the use of c-PentaBDE is forbidden in the following States:

- California
- Hawaii
- Illinois
- Maine
- Maryland
- Michigan
- New York
- Oregon

Japan:

- The use of c-PentaBDE was voluntarily withdrawn from the Japanese market in 1990.

Canada:

- In 2004, Environment Canada released a draft “Environmental Screening Assessment Report on Polybrominated Diphenyl Ethers (PBDE’s)”
- In 2004, Health Canada released a “Screening Assessment Report-Health: Polybrominated Diphenyl Ethers (PBDE’s) [Tetra-, Penta-, Hexa-, Hepta-, Octa-, Nona- and Deca- congeners]”

Norway:

- In 2002, Norway established a National action plan for brominated flame retardants.
- Since 2004, the production, import, export and marketing of products containing more than 0.1% per weight of Penta-BDE was banned and products containing more than 0.25% Penta-BDE are classified as hazardous waste when discarded.

China:

- China is currently preparing the “Management Methods for the Prevention and Control of Pollution from Electronics Information Products” banning c-PentaBDE amongst other chemicals.

OECD:

- OECD's risk reduction programme developed a risk assessment on c-PentaBDE published in 1994 that led industry to enter into a voluntary agreement with OECD in 1995 to minimise the risk of production spills and to refrain from producing more.

Explanatory notes:

19. Actions or measures taken could include prohibitions, phase-outs, restrictions, cleanup of contaminated sites, waste disposal, economic incentives, and other non-legally binding initiatives.
20. Information could include details on whether these control actions have been cost-effective in providing the desired benefits and have had a measurable impact on reducing levels in the environment and contributed to risk reduction.

H. Other relevant information for the risk management evaluation:

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Explanatory notes:

21. The above list of items is only indicative. Any other relevant information for the risk management evaluation should also be provided.

I. Other information requested by the POPRC:

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