

HBCD Industry Group and EUMEPS position on the appropriate low POP content for Hexabromocyclododecane (HBCD) in waste

Brussels, May 2022

1. Introduction and executive summary

The HBCD Industry Group (IG) would like to provide comments and information on the low persistent organic pollutant (POP) content values for hexabromocyclododecane (HBCD). **The European HBCD IG firmly believes that for HBCD the most appropriate low POP content is 1000 mg/kg.**

The following assessment provides environmental, health and socio-economic impact effects of a reduction of the Low POP Content related to Polystyrene (PS) foams¹ and addresses both destruction and recovery options.

- No available information shows that there is harm caused by the current 1000 mg/kg low POP content. HBCD, being firmly incorporated in the stable polystyrene matrix, is not readily if at all released from PS foam waste. Hence the impact on the environment and human health is negligible^{2,3}.
- Therefore, we recommend maintaining the current status quo (1000 mg/kg) for HBCD as this is the most appropriate level which strikes a balance between health and environmental concerns on the one side, and the objectives to reduce greenhouse gas emissions.
- Up until now accepted standardized methods are validated for concentrations at and above 1000 mg/kg⁴.
- A low POP content of 1000 mg/kg for HBCD captures all flame retarded polystyrene foam wastes from demolition⁵, since such foams contain HBCD well above 1000 mg/kg⁶.
- In the absence of a validated analytical method to detect HBCD levels below 1000 mg/kg, collection and sorting facilities would likely adopt a more precautionary approach where much more PS foams are diverted to incineration or landfill.

2. Addressing enforcement and analytical methods for HBCD in Polystyrene Foam waste

The analytical methodologies and tools to measure HBCD in a PS foam matrix represent a prerequisite for successful compliance and enforcement of the low POP content values. Today the accepted standardized methods are validated for concentrations at and above

¹ Polystyrene (PS) foams represent a unique family of products and articles since their applications can be broadly split into packaging and building & construction, and hence deliver separate waste streams. Packaging waste nowadays does not contain intentionally added HBCD anymore. Demolition waste may contain HBCD largely in excess of 1000 mg/kg. It follows that demolition waste will primarily end up in Advanced Solid Waste Incineration (ASWI), the viability of the destruction of HBCD having been demonstrated in a large-scale incineration trial at the Würzburg incinerator. Packaging waste can however be recycled, the only concern being potential unintentional (cross) contamination with HBCD containing foams.

² ECHA 'Data on Manufacture, Import, Export, Uses and Release of HBCD as well as information on potential alternatives to its use', 2009 <https://www.informea.org/en/data-manufacture-import-export-uses-and-releases-hbccd-well-information-potential-alternatives-its>

³ PlasticsEurope, Exiba, EFRA, CEFIC: 'HBCD Hexabromocyclododecane in Polystyrene Foams Product Safety Assessment' 2016 (submitted to UNEP Secretariat together with this paper)

⁴ General technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants available at:

[http://www.basel.int/TheConvention/OpenedWorkingGroup\(OEWG\)/Meetings/OEWG12/Overview/tabid/8264/Default.aspx](http://www.basel.int/TheConvention/OpenedWorkingGroup(OEWG)/Meetings/OEWG12/Overview/tabid/8264/Default.aspx) (UNEP/CHW/OEWG.12/INF/7/Rev.2 - information document section)

⁵ For Parties that have [registered](#) to make use of the exemption, the same would apply for HBCD-containing waste from construction

⁶ EPS contains on average 5000-10000 mg/kg HBCD and XPS contains on average 8000-25000 mg/kg HBCD

1000 mg/kg⁷. There is ongoing work within the global standardization body IEC111 for lowering this limit to 500 mg/kg for some of the methods.

Based on the experience developed over the last 5-10 years, the HBCD IG is preparing a documentation that will display more in detail the analytical boundaries and constraints related to the waste management of HBCD containing foams. This documentation is meant to meet the standards included in the General Technical Guidelines on the Environmentally Sound Management of Wastes consisting, containing or contaminated with POPs⁸ and it will be shared with the BRS Secretariat and interested Parties.

Reducing the HBCD low POP content will neither reduce uncontrolled waste disposal nor help enforcement of national regulation (following COP decisions). Therefore, lowering the low POP content below 1000 mg/kg will not bring improved health and environmental performance. In contrary, general learnings from waste management have shown evidence that unrealistic requirements will undermine commitment and support by all stakeholders and promote illegal evasive actions.

3. Addressing Parties' concerns on transboundary shipments

Countries that have limited capacity to detect or treat POP-containing waste at the national level will rely on strict international standards (i.e. strict low POP content values) to ensure that POP-containing waste does not enter the country in the first place. Conversely to what it is thought, the lack of capacity to analyse waste makes it necessary to establish practical limits which allow the easy and cost-effective identification of HBCD. Lowering the current low POP content for HBCD will not be effective as such a limit would capture the same amount of waste as 1000 mg/kg, but would make the identification of that waste unnecessarily costly and complex and hence vulnerable to criminal evasive actions.

4. Environmental impact of Polystyrene Foam waste and related economic considerations

HBCD being firmly incorporated in the stable polystyrene matrix, is not readily – if at all – released from PS foam waste (containing HBCD) to the environment, be it to air, water or soil, and hence the environmental impact is minimal⁹. Therefore, the dismantling, transport or disposal of the waste foams do not have negative impacts for the environment¹⁰.

In Europe, it has been shown that recovering PS foams brings significant energy savings from the avoided emissions of the creation of virgin raw materials, and saves around 50% CO₂ emissions compared to sending them for energy recovery via incineration. If a low POP content below 1000 mg/kg is adopted, more PS foam waste containing HBCD is likely to be sent to landfill¹¹. There is the risk that limited capacities and raising costs of depositing waste

⁷ General technical guidelines on the environmentally sound management of wastes consisting of, containing or contaminated with persistent organic pollutants available at:

[http://www.basel.int/TheConvention/OpenendedWorkingGroup\(OEWG\)/Meetings/OEWG12/Overview/tabid/8264/Default.aspx](http://www.basel.int/TheConvention/OpenendedWorkingGroup(OEWG)/Meetings/OEWG12/Overview/tabid/8264/Default.aspx) (UNEP/CHW/OEWG.12/INF/7/Rev.2 - information document section)

⁸ Available at:

[http://www.basel.int/TheConvention/OpenendedWorkingGroup\(OEWG\)/Meetings/OEWG12/Overview/tabid/8264/Default.aspx](http://www.basel.int/TheConvention/OpenendedWorkingGroup(OEWG)/Meetings/OEWG12/Overview/tabid/8264/Default.aspx) (UNEP/CHW/OEWG.12/INF/7/Rev.2 - information document section)

⁹ ECHA (ibid); and PlasticsEurope, Exiba, EFRA, CEFIC (ibid)

¹⁰ This was also confirmed by the implementation of the German POP Waste Monitoring Ordinance (POP-Abfall-Überwachungs Verordnung) that entered into force in July 2017, Available at: <https://www.gesetze-im-internet.de/pop-abfall-berwv/BJNR264410017.html>

¹¹ EU Regulatory Scrutiny Board Opinion, SEC(2021) 379 final, "Potential additional waste management costs for demolition operators and construction / demolition contractors resulting from diversion of 0.2% (640,000 t) of all C&D waste from non-hazardous waste landfill to hazardous waste landfill due to contaminants with EPS/XPS containing HBCD."

in a landfill would pave the way for more uncontrolled and non-compliant dumping in countries with a low level of waste management, especially in the absence of sufficient advanced solid waste incinerator (ASWI) capacities¹².

A reduction of the HBCD low POP content below 1000 mg/kg will have the indirect effect of undermining the waste management operations in place today, severely reducing the availability of secondary raw materials. This will result in operational capacity reductions and investment uncertainties due to unclear amounts of available feedstock. The increased costs and additional administrative burden will negatively affect this business, hampering the achievement of circular solutions in this sector with suppliers unable to afford the additional costs in the worst-case scenario.

In essence, a low POP content below 1000 mg/kg fails to meet basic technical, environmental, and commercial requirements needed to satisfy compliance and enforcement duties dictated by entrepreneurial and business planning security.

5. Conclusion

A low POP content of 1000 mg/kg is practical, effective, pragmatic, environmentally sound and enforceable. It allows for the destruction of the vast majority of HBCD as contained in demolition waste foams while it supports the economic viability of recycling polystyrene foam wastes that do not contain HBCD.

Any limit lower POP content than 1000 mg/kg will pose significant and possibly disruptive challenges for the polystyrene value chain would create a negative precedent for the whole of plastics waste management industry and will have a negative environmental impact. Such impacts should be carefully considered.

6. About the industry sector

This paper sets out the views of relevant industry sectors. The HBCD Industry Group gathers former producers of HBCD (BSEF) and producers of polystyrene insulation foam, the EPS- and XPS (Exiba) sector of the Styrenics Product Group under the umbrella of PlasticsEurope. Its primary mission is to assist in the management of the end of life of this legacy substance, and to support the safe, efficient, and quantitative elimination of HBCD from the value chain. This paper is also signed by the association for European Manufacturers of Expanded Polystyrene (EUMEPS).

¹² e.g. in Europe, limited to a 2% load by weight of PS foam material as shown in the Würzburg trials - 2% by weight corresponds to more than 20% by volume and is the maximum load that still guarantees undisturbed operation of the incinerator in Mark, F.E., Vehlow, J., Dresch, H., Dima, B., Gruttner, W., Horn, J. Destruction of the flame retardant hexabromocyclododecane in a full-scale municipal solid waste incinerator. Waste Management & Research. 2015, 33, 165-174.