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HEAL response to Sweden's proposal to identify decabromodiphenyl ethane (DBDPE) as a substance of very high concern (SVHC) - REACH Article 57 (e)

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The Health and Environment Alliance (HEAL) thanks the Swedish Chemicals Agency for its proposal to identify 1,1'-(ethane-1,2-diyl)bis[pentabromobenzene] (decabromodiphenyl ethane; DBDPE; EC 284-366-9) as a substance of very high concern (SVHC) due to its very persistent and very bioaccumulative (vPvB) properties (REACH Article 57(e)). We fully support this proposal.

Comments on the proposed SVHC property

Very persistent and very bioaccumulative (vPvB) (REACH Article 57(e))

The available information shows that DBDPE is very persistent: Based on experimental results of an aquatic sediment and a soil biodegradation study, the degradation half-life of DBDPE in sediments and soils is above the classification threshold for very persistent substances. *In silico* data complements and supports this finding. Additionally, the readiness of DBDPE to adsorb to particles is expected to hinder degradation reactions of DBDPE in water (hydrolysis) and air (reaction with tropospheric hydroxyl radicals).

Likewise, the available information shows that DBDPE is very bioaccumulative: Due to the physical-chemical properties of DBDPE, its primary exposure pathway for organisms is expected to be through dietary intake. Several academic studies show the bioaccumulation of DBDPE for predator/prey-relationships such as those of estuary predator fish with crab and fish, predator bird with bird eggs, frogs with insects, marine fish predator with fish, and songbirds with insects. These results are supported by the wide detection of DBDPE in wildlife, including in key predators, and high reported biomagnification factors (BMF) and trophic magnification factors (TMF) in several species. The low elimination rate of DBDPE in rats and the accumulation of the substances in liver and adrenal glands in mice and rat provide further corroborative evidence for its very bioaccumulative properties. Uncertainties and analytical problems render the available guideline laboratory fish bioaccumulation studies unreliable, as for example the actual exposure concentrations of bioavailable DBDPE (through water or diet) are unclear. Therefore, we agree with the dossier submitter that the extensive field and monitoring data provides sufficient evidence for the high bioaccumulation potential of DBDPE and that non-laboratory data reflects the actual exposure form (via food webs) and exposure durations (extended exposure times) of wildlife to the substance.

Based on the information summarised above, HEAL supports the identification of the substance as an SVHC due to its very persistent and very bioaccumulative (vPvB) properties under REACH article 57(e).

Specific comments on 'Information on Use, Exposure, Alternatives and Risks'

In total, DBDPE is registered in the EU at an aggregated total tonnage band of 10 000 - 100 000 tonnes per annum, with information from the 2024 ECHA investigation report on flame retardants indicating an annual total manufactured and imported tonnage of about 26 700 tons [1].

DBDPE is used as an additive (non-polymeric) flame retardant in various sectors such as electrical and electronic equipment, automotive, building and construction, textiles and aerospace and defence [1]. It is registered for use at industrial sites (e.g. during the manufacture of plastics products or in textile coating), by professional workers (e.g. in the professional application of coating and inks) and by consumers (e.g. in coating and inks application).

In the literature review of the ECHA investigation report on aromatic brominated flame retardants, 116 studies with data from the year 2000 onwards were identified on the releases and presence/detection of DBDPE in the EU/EEA area. Based on the review results, DBDPE was detected in various biotic and abiotic compartments including indoor and outdoor air and dust, soil, sediment, sewage sludge, groundwater, freshwater, marine water, wastewater, flora and fauna (incl. mammals, fish and invertebrates) [1]. Additionally, DBDPE has been detected in human tissues, such as human breast milk samples from Denmark [2].

HEAL concludes that DBDPE is placed on the EU market at very high tonnages and extensively used e.g. in mixtures and articles. Users of DBDPE include industrial and professional workers and consumers. DBDPE has been widely detected in all environmental compartments including in remote areas, and the chemical has also been found in humans.

References

[1] ECHA (2024). Investigation report on aromatic brominated flame retardants. Available at: https://echa.europa.eu/completed-activities-on-restriction

[2] Hammel, S. C., Vorkamp, K., Nielsen, J. B., Sørensen, L. S., Knudsen, L. E., & Frederiksen, M. (2024). Novel and legacy brominated flame retardants in human breast milk and house dust from Denmark. Journal of Environmental Exposure Assessment, 3(1), 8. https://www.oaepublish.com/articles/jeea.2023.51

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