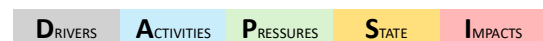


2-Ethylhexyl diphenyl phosphate (EHDPP)

General sectors: Industry and commercial products

(CAS numbers: e.g. 1241-94-7, EC number: 214-987-2

/ Entry number in HELCOM list of substances of concern: 3)



Why a HELCOM concern?

Main evidence

P Approximately **0.3-5 tonnes of EHDPP** are estimated to enter the Baltic Sea every year mainly via rivers, and to a lower extent directly via WWTP emissions (Gustavsson et al, 2018¹, Undeman et al, 2022²). Given that the substance is **suspect as toxic**³, current inputs are possibly significant, in terms of risk they pose for the Baltic Sea and its ecosystem services. The data used for the riverine inputs estimation concerns only measurements in the proximity of river mouths. They originate from one-grab samples from the 23 rivers covering the whole latitudinal range of Sweden. And they have been extrapolated to the total riverine flow to Baltic Sea. The contribution of direct releases was calculated as a percentage of the total WWTP discharges estimated by Undeman et al. study (2010-2019).

S Concentrations of EHDPP exceed the applied threshold value in **2** of the 3 examined areas (assessment units) of the Baltic Sea. The threshold is exceeded in both coastal and off-shore areas (**2/2** assessed off-shore areas). In these 2 areas, **100%** of the assessable samples in **sediment** exceed the threshold value. This is based on monitoring data for the period 2015-2024 available in national and international databases⁴. A total number of 5 data points were possible to evaluate for EHDPP.

By further considering how much above or below the threshold each concentration is, and how often the substance is detected, EHDPP scores **3.6/10** (confidence range: **2.4 – 6.8**) in the scale established when assessing the criticality/significance of current levels in the Baltic Sea pose, where 5 indicates concern and 10 extreme risk, and the range reflects the level of reliability and representativeness of concentrations and the thresholds.

The threshold value for EHDPP, for sediment, was acquired from the NORMAN Network ecotoxicology database⁵.

I Current levels in the Baltic Sea indicate potential negative impacts on sediment dwelling biota and/or pelagic biota.

Supporting evidence

I EHDPP is considered to have an especially **concerning mode of toxicity**. For example, it is an endocrine disruptor⁶. Endocrine disruptors mimic or interfere with hormones and can cause developmental abnormalities, reproductive dysfunction, and population effects.

Overall assessment

When assessing current levels in the Baltic Sea, current inputs, and the severity of the relevant toxicity mechanism, EHDPP scores **32-53/100** in the scale established for assessing the overall risk for impacts/threat for the Baltic Sea, where 50 indicates concern, 100 extreme risk, and the width of the span outlines the uncertainty in the assessment.

Facts relevant for management considerations

Causal chain and pathways

A The EU REACH registered volume for EHDPP is >10,000 t/y⁷. Registered uses are as flame retardant and potentially further technical functions in professional uses (adhesives, sealants, fillers, putties, plasters, polymer, leather tanning, dyes, finishes, functional fluids, PUR), industrial uses (formulation, same as professional plus use of pellets, powder coatings, granules coating material, etc.), as well as service life of respective products⁸.

S **?** *In order to further improve the evaluation of the risk, relevant aspects to consider are a review of the toxicity threshold (sediment) and further marine monitoring or modelling for predicted environmental concentrations based on estimated inputs.*

Relevant policies (existing or planned measures)

- M (on A/P)**
- EHDPP is covered by **two Assessments for Regulatory Needs prepared by ECHA** recently ('Regulatory strategy for flame retardants', 'Alkyl aryl and cyclic diaryl esters of phosphoric acid')⁹.
 - A PBT-assessment¹⁰ by the ECHA PBT group concluded that **it does not fulfil REACH PBT/vPvB criteria**, in 2013.
 - There is ongoing toxicity data generation, under REACH Dossier Evaluation, for some endpoints.

References:

1. 2. 3. 4. 5. 6. 7. 8. 9. 10.

[Note: Listing of detailed references will be provided in an upcoming update of the fact sheet – for a listing of the most common references among the different substances see the section at the end of the consolidated document which includes all the fact sheets]