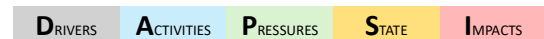


Phthalates

(CAS numbers: e.g. 117-81-7, EC numbers: e.g. 204-211-0
/ Entry number in HELCOM list of priority substances: 32)

General sectors: Industry and
commercial products, off-shore
(shipping)



Why a HELCOM priority?

Main evidence

S Concentrations of a substance tentatively identified as isobutyl hydrogen phthalate exceed the applied threshold value in **14** of the 21 examined areas (assessment units) of the Baltic Sea. The threshold is exceeded in both coastal and off-shore areas (**1/2** assessed off-shore areas). In these 14 areas, on average **74%** of the assessable samples in **biota** exceed the threshold value. This is based on suspect screening data from the project PreEMPT¹. A total number of 100 data points were possible to evaluate for this substance.

By further considering how much above or below the threshold each concentration is, and how often the substance is detected, isobutyl hydrogen phthalate scores **7.7/10** (confidence range: **6.7 – 8.3**) 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 fact that the chromatographic peaks have not yet been confirmed via a commercial standard adds to the relative uncertainty.

Based on monitoring data (national and international databases² - in some cases also complemented by suspect screening data), concentrations of DEHP (Di-(2-Ethylhexyl)-phthalate), Diisobutyl phthalate, and Di-n-octyl phthalate also frequently or occasionally, depending on the substance, exceed their respective threshold values, for matrices such as **water, sediment, and/or biota**. The threshold value, e.g. for DEHP (water matrix - the matrix exceeded for this substance), was acquired from the EQS Directive³. The threshold value for isobutyl hydrogen phthalate, for biota, was acquired from the NORMAN Network ecotoxicology database⁴.

I Current levels in the Baltic Sea indicate potential negative impacts on pelagic biota and/or sediment dwelling biota and/or top predators such as mammals and birds and/or humans via consumption of seafood.

Supporting evidence

P Approximately **50 – 210 tonnes of DEHP** are estimated to enter the Baltic Sea every year, essentially via rivers (WATERBASE⁵), with very small contribution from direct emissions from land-based activities (Undeman et al, 2022⁶, E-PRTR⁷). Additional inputs to this estimate may be expected from shipping and from atmospheric deposition (unquantified). Given that it is **toxic⁸** (according to the EU WFD/EQSD update proposal, it also tends to accumulate in sediment and/or biota⁸), current inputs are considered as possibly significant, in terms of risk they pose for the Baltic Sea and its ecosystem services. As mentioned above, levels in Baltic Sea for DEHP have occasionally exceeded thresholds.

I Phthalates are considered of **especially concerning mode of toxicity**: for example DEHP is toxic for reproduction and an endocrine disruptor⁹. 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, for example DEHP scores **56-60/100** 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. Besides DEHP, several other phthalates (ortho-phthalates, isophthalates, terephthalates, trimellitates) have or are suspected to have hazardous properties and concerning environmental fate and/or occurrence profiles¹⁴. And they also show a similar use pattern and could replace each other in some of their uses¹⁴. This substance group entry aims to reflect all such relevant individual substances.

Facts relevant for management considerations

Causal chain and pathways

A Several phthalates are EU REACH registered. For DEHP (which is in REACH Authorization list), authorised sectors concern **PVC products** (review of authorisation is ongoing)¹⁰. The REACH registered volume for DEHP is 100 - 1,000 t/y¹¹. Main sectors which officially reported releases of DEHP to the Baltic Sea catchment in the context of E-PRTR¹¹ and the respective shares for the reported emissions are as following (a broader overview including REACH-registered uses with potential emissions has not been compiled here): Releases to water/soil (average reported releases 43 kg/y, in the period 2018-2022): Coke ovens (73%), Independently operated industrial wastewater treatment plants (14%), Chemical installations for the production on an industrial scale of basic organic chemicals (7%). Releases to air (average reported releases 160 kg/y, in the period 2018-2022): Installations for the production of cement clinker in rotary kilns, lime in rotary kilns, cement or lime in other furnaces (100%). Shipping emissions of DEHP relate to bilge water or ballast water¹².

S ? *In order to further improve the evaluation of the magnitude of risk, one aspect that could be investigated in the future is a review of the toxicity thresholds for some phthalates (relevant matrix/ces depending on the individual substance).*

Relevant policies (existing or planned measures)

M (on A/P) • Several activities are restricted under EU REACH and some under EU RoHS (electrical and electronic devices). **18 phthalates are listed as SVHC** (Substances of Very High Concern) **under EU REACH** (mainly on the basis of their toxicity for reproduction properties, but some also due to their endocrine disrupting properties). DEHP has been further included in the **REACH Authorization list**. ECHA (and perhaps some EU Member States, to be confirmed) has also developed **Assessments of Regulatory needs (ARN) for sub-groups of phthalates (e.g. ortho phthalates)**¹³.

• DEHP is listed as a priority hazardous substances under the **EU WFD** and its update proposal.

References: 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14.

[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]