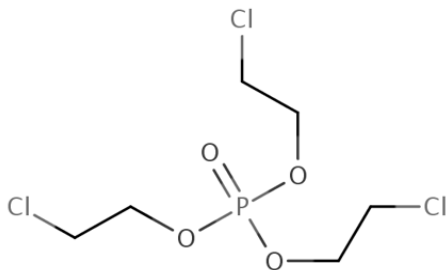


Nontechnical Summary of the TSCA Risk Evaluation for Tris(2- chloroethyl) Phosphate (TCEP)



C₆H₁₂Cl₃O₄P (CASRN: 115-96-8)

Why Is EPA Providing This Document?

EPA evaluated the risks of TCEP to human health and the environment under the Toxic Substances Control Act ([TSCA](#)). This document summarizes the results of the completed risk evaluation.

What Is TCEP and How Is It Used?

TCEP is used as a flame retardant and plasticizer to improve the flexibility and durability of specific products. While its U.S. production has dropped by about 99 percent over the last decade, TCEP is still added to some paints and coatings used in the construction and automotive industries. TCEP can also be found in polymers used in the aerospace industry. Before 2014, TCEP was used in many products like fabrics, foam, and construction materials—some of which remain in use today. TCEP may still be found in consumer products imported into the United States.

How Might Persons be Exposed to TCEP?

Exposure to TCEP can occur in and near workplaces that use it as a flame retardant or plasticizer. Workers and others nearby¹ can be exposed by breathing, swallowing, and getting TCEP on their skin. Most people will be exposed to TCEP by breathing in or swallowing

¹ Called “occupational non-users,” these workers do not directly handle TCEP but may be indirectly exposed to it through its use in the workplace.

dust containing TCEP from furniture and consumer products in their home. TCEP can be released to air and water such as from landfills. EPA evaluated all these exposures to determine if there was unreasonable risk to human health.

How Has EPA Assessed TCEP under TSCA?

In September 2024, EPA published the [Risk Evaluation for TCEP](#) that evaluated risks to the following groups:

- workers;
- consumers, including infants and children, who may use TCEP-containing products or have TCEP-containing articles in their homes; and
- people who may consume fish contaminated with TCEP.

The 2024 assessment considered groups of people who have higher exposures to TCEP or are more likely or liable to be harmed by exposure. Such potentially exposed or susceptible subpopulations include the following:

- workers;
- consumers;
- people who live near TCEP release sites;
- people who may be more susceptible to TCEP due to age (including young children), genetic variations, health conditions, or other factors; and
- people and Tribes whose diets include large amounts of fish.

The 2024 risk evaluation assessed risks to the environment, including trout, catfish, and other fish, as well as aquatic organisms like water fleas and algae. It also assessed risks to land animals that might be exposed to TCEP, ranging from earthworms to shrews to mink and other mammals.

Is TCEP Harmful to People?

Based on laboratory animal studies, high levels of exposure to TCEP could cause cancer in people. Other effects include risk of neurological and behavioral effects, kidney disease, non-cancerous thyroid tumors, and reproductive effects in males.

Is TCEP Harmful to the Environment?

At high concentrations in water and sediment of lakes and rivers, TCEP can harm the growth and survival of aquatic organisms, such as fish, frogs, and aquatic plants.

What Is EPA's Final Risk Determination for TCEP under TSCA?

TCEP presents an unreasonable risk of injury to human health and the environment.

EPA considered the following factors when determining unreasonable risk from TCEP:

- the nature and severity of the health and environmental effects;
- the duration, amount, and frequency of TCEP exposures;
- the populations exposed; and
- the Agency's confidence in the risk estimates.

The following 10 (of 21 assessed) TSCA conditions of use (COUs)² significantly contribute to the unreasonable risk:

- Manufacturing (import);
- Processing – Incorporation into formulation, mixture, or reaction product – Paint and coating manufacturing;
- Processing – Incorporation into formulation, mixture, or reaction product – Polymers used in aerospace equipment and products;
- Processing – Incorporation into article – Aerospace equipment and products and automotive articles and replacement parts containing TCEP;
- Industrial use – Paints and coatings;

- Commercial use – Paints and coatings;
- Commercial use – Laboratory chemicals;
- Consumer use – Furnishing, cleaning, treatment/care products – Fabric and textile products;
- Consumer use – Furnishing, cleaning, treatment/care products – Foam seating and bedding products; and
- Consumer use – Construction, paint, electrical, and metal products – Building/construction materials – Wood and engineered wood products – Wood resin composites.

The following 11 COUs do *not* significantly contribute to the unreasonable risk:

- Processing – Recycling;
- Distribution in commerce;
- Industrial use – Other use – Aerospace equipment and products and automotive articles and replacement parts containing TCEP;
- Commercial use – Other use – Aerospace equipment and products and automotive articles and replacement parts containing TCEP;
- Commercial use – Furnishing, cleaning, treatment/care products – Fabric and textile products;
- Commercial use – Furnishing, cleaning, treatment/care products – Foam seating and bedding products;
- Commercial use – Construction, paint, electrical, and metal products – Building/construction materials – Insulation;
- Commercial use – Construction, paint, electrical, and metal products – Building/construction materials – Wood and engineered wood products – Wood resin composites;
- Consumer use – Paints and coatings, including those found on automotive articles and replacement parts;

² Under TSCA, COUs are the specific circumstances, “as determined by the Administrator, under which a chemical substance is intended, known, or reasonably foreseen to

be manufactured, processed, distributed in commerce, used, or disposed of.”

- Consumer use – Construction, paint, electrical, and metal products – Building/construction materials – Insulation; and
- Disposal.

Human Health: Short-term exposure to high levels of TCEP can cause neurological, reproductive, and kidney damage. Exposure over longer periods can also cause neurological and kidney tissue damage. Long-term exposure to TCEP can lead to kidney cancer. These risks apply to (1) workers who breathe or whose skin comes into contact with TCEP; (2) people who eat large amounts of TCEP-contaminated fish; and (3) consumers who breathe, swallow, or “mouth” TCEP-containing objects or get dust containing TCEP on their skin. However, workers using gloves do not face risks from skin contact with TCEP.

The Environment: EPA identified long-term risks to aquatic organisms in water and sediment from TCEP releases to surface waters like rivers and lakes. However, the Agency found that short-term exposure to TCEP does not present unreasonable risk to fish and other aquatic organisms. Such exposures are likely localized to surface water near facilities releasing TCEP. EPA found no risks to land animals, including large mammals and soil-dwelling invertebrates like earthworms, from short- or long-term exposure to TCEP.

How Will EPA Protect Human Health and the Environment from TCEP under TSCA?

Following a final determination of unreasonable risk, TSCA requires EPA to address the unreasonable risk. The Agency may propose regulations that could include banning or limiting TCEP in specific uses. EPA may also propose regulations that require labeling or recordkeeping requirements to restrict its use. After taking public comment on proposed regulations, TSCA requires EPA to finalize risk management regulations for TCEP.

For More Technical Information, Including Previous EPA Actions, See the Following:

- [Risk Evaluations for Existing Chemicals under TSCA](#)
- [Proposed Significant New Uses Rules for Certain Non-ongoing Uses: Flame Retardants](#)
- [2023 Draft Risk Evaluation for Tris\(2-chloroethyl\) Phosphate \(TCEP\)](#)