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Environmental Protection Agency

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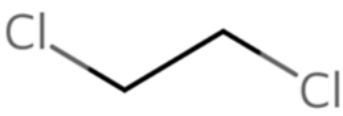
Office of Chemical Safety and
Pollution Prevention

Nontechnical Summary of the TSCA Risk Evaluation for 1,2-Dichloroethane



$C_2H_4Cl_2$ (CASRN: 107-06-2)

Why Is EPA Providing This Document?

EPA assessed the risks of 1,2-dichloroethane to human health and the environment under the Toxic Substances Control Act (TSCA). This document summarizes the results of the *Risk Evaluation for 1,2-Dichloroethane*.

What Is 1,2-Dichloroethane and How Is It Used?

Also known as ethylene dichloride, the chlorinated solvent 1,2-dichloroethane is a volatile, colorless, and oily liquid with a chloroform-like odor. It is primarily used in the synthesis of vinyl chloride; over 90% of produced 1,2-dichloroethane is converted to vinyl chloride. The production volume (including imports) for 1,2-dichloroethane ranges from 30 to 40 billion pounds per year. Consumer use of a limited number of imported articles containing 1,2-dichloroethane were identified, and small amounts of 1,2-dichloroethane are used in laboratories.

How Can Persons and the Environment Be Exposed to 1,2-Dichloroethane?

Workers can be exposed to 1,2-dichloroethane during its manufacture or use. Manufacturing, processing, distributing, using, or disposing of 1,2-dichloroethane can release it into the environment—including air, water/sediment, and land. EPA evaluated these exposures to determine if there was unreasonable risk to human health and the environment.

Can 1,2-Dichloroethane Harm People Who Are Exposed?

Based on findings in laboratory animals, 1,2-dichloroethane can cause kidney damage through daily ingestion. It can also damage the respiratory (nasal) tract and male reproductive system through inhalation. Based on animal studies, EPA believes that repeated inhalation or dermal exposure to 1,2-dichloroethane in workers, including occupational non-users (ONUs),[1] over a lifetime can cause cancer. As discussed below, the Agency has determined that 1,2-dichloroethane presents an unreasonable risk of injury to human health. However, EPA did not identify unreasonable risk to consumers or the general population.

Can 1,2-Dichloroethane Harm the Environment?

EPA has determined that 1,2-dichloroethane is not harmful to the environment at the levels expected to result from TSCA use and associated releases. The risk evaluation assessed risks to the environment (evaluating effects on aquatic vertebrates, invertebrates, plants, and algae) using data from 1,2-dichloroethane and similar chemicals (analogs).[2] It also assessed risks to land animals, birds, and plants that could be exposed to 1,2-dichloroethane at ecologically relevant concentrations.

[1] ONUs do not directly handle 1,2-dichloroethane but may be indirectly exposed to it in workplace air as part of their employment.

[2] EPA used environmental hazard data for the chlorinated solvents 1,1-dichloroethane, 1,1,2-trichloroethane and 1,2-dichloropropane.

How Has EPA Assessed 1,2-Dichloroethane Under TSCA?

EPA assessed risks to human health and the environment. As required by law, the Agency identified and evaluated potentially exposed or susceptible subpopulations (PESS[3]), which include the following:

- workers, including those who manufacture, process, distribute, or use 1,2-dichloroethane in the workplace;
- consumers;
- members of the general population who may be exposed through releases of 1,2-dichloroethane to the environment;
- people who may be at greater risk to 1,2-dichloroethane, including because of their age, genetic predispositions, and pre-existing health conditions; and
- subsistence fishers and tribal populations whose diets include large amounts of fish.

EPA also evaluated risks resulting from exposure to the following byproducts produced during the manufacture of 1,2-dichloroethane: 1,1-dichloroethane, trichloroethylene, perchloroethylene, methylene chloride, and carbon tetrachloride. Although the manufacture of 1,2-dichloroethane also produces *trans*-1,2-dichloroethylene and 1,1,2-trichloroethane as byproducts, both chemicals will be assessed in separate TSCA risk evaluations.

In November 2025, EPA released the *Draft Risk Evaluation for 1,2-Dichloroethane* for public comment and peer review. The *Draft Human Health Hazard Assessment for 1,2-Dichloroethane* was previously released with the *Draft Risk Evaluation for 1,1-Dichloroethane* for public comment in July 2024 and peer reviewed by the independent Science Advisory Committee on Chemicals (SACC) in September 2024. This final risk evaluation for 1,2-dichloroethane reflects changes made as the result of public comment and external peer review by the SACC.

What Is EPA's Risk Determination for 1,2-Dichloroethane Under TSCA?

1,2-Dichloroethane presents an unreasonable risk to workers from inhalation and dermal exposures for 15 (of 20 total) "conditions of use" (COUs).[4] *Twelve of these 15 COUs also present unreasonable risk to ONUs:*

- Manufacturing – Domestic manufacture
- Manufacturing – Import
- Processing – As a reactant – Intermediate in: Petrochemical manufacturing; Plastic material and resin manufacturing; All other basic organic chemical manufacturing; All other basic inorganic chemical manufacturing *[Workers only]*
- Processing – Incorporated into a formulation, mixture, or reaction product – Fuels and fuel additives: All other petroleum and coal products manufacturing
- Processing – Incorporated into a formulation, mixture, or reaction product – Processing aids: Specific to petroleum production; Plastics material and resin manufacturing
- Processing – Incorporated into a formulation, mixture, or reaction product – Adhesives and sealants; Lubricants and greases; Oxidizing/reducing agents; Degreasing and cleaning solvents; Pesticide, fertilizer, and other agricultural chemical manufacturing
- Processing – Repackaging
- Processing – Recycling *[Workers only]*
- Industrial use – Adhesives and sealants
- Industrial use – Lubricants and greases – Solid film lubricants and greases
- Industrial use – Other use – Process solvent
- Industrial use – Process regulator – *e.g.,* Catalyst moderator, oxidation inhibitor *[Workers only]*

[3] These groups may have higher exposures to 1,2-dichloroethane or be more likely (predisposed) to be harmed by exposure to 1,2-dichloroethane.

[4] 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."

- Industrial use – Solvents (for cleaning and degreasing) – Degreasing and cleaning solvents
- Commercial use – Other use – Laboratory chemical
- Disposal.

Risk to workers is reduced when specific respirators or other workplace controls are in place (*i.e.,* the risk for workers would no longer be unreasonable).

The following five COUs under TSCA, including one consumer COU, do *not* contribute significantly to unreasonable risk of injury to human health:

- Distribution in commerce
- Industrial use – Functional fluids (closed systems) – Heat transferring agent
- Commercial use – Plastic and rubber products
- Commercial use – Fuels and related products
- Consumer use – Plastic and rubber products.

EPA did not identify contributions to unreasonable risk of injury for consumer exposure, exposure to the general population, or to the environment, under any COU.

How Will EPA Protect Human Health from 1,2-Dichloroethane Under TSCA?

Following this final determination of unreasonable risk, TSCA requires EPA to initiate risk management actions to reduce or eliminate any unreasonable risk of 1,2-dichloroethane to human health or the environment. The Agency will finalize risk management regulations that mitigate the unreasonable risk through worker protection requirements; monitoring; or the restriction or prohibition of the manufacture, processing, distribution, or use of the chemical.