

Product Safety Assessment

DOW™ Propylene Glycol

Product Safety Assessment documents are available at www.dow.com/productsafety/assess/finder.

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Names

- CAS No. 57-55-6
- Propylene Glycol (PG)
- 1,2-Dihydroxypropane
- Propylene Glycol industrial grade
- Propylene Glycol USP/EP

- DOW PuraGuard™ Propylene Glycol USP/EP
- DOW™ Propylene Glycol
- Monopropylene Glycol (MPG)
- Propane-1,2-diol
- 1,2-Propanediol

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Product Overview

- DOW™ Propylene Glycol is a viscous, colorless, odorless liquid.^{1,2} For further details, see Product Description.
- DOW Propylene Glycol is used as a raw material for the manufacture of other chemicals and as an ingredient in product formulations. Applications include unsaturated polyester resins, urethanes, coolants and antifreeze, aircraft deicing fluid, hydraulic and brake fluids, heat transfer fluids, and fragrances, cosmetics, personal care products, and pharmaceuticals.^{3,4} For further details, see Product Uses.
- Worker exposure is possible at propylene glycol production facilities, during transport, or at the various industrial or manufacturing facilities that use propylene glycol. Occupational exposure limits have been established to control the allowable amount of exposure in workplace settings. Propylene glycol is broadly used in consumer products including perfumes and colognes, cosmetics, hand sanitizer, deodorant, shampoo, and many others. DOW Propylene Glycol used for personal care applications is a high-purity product that meets the safety standards of the United States Pharmacopeia (USP), U.S. Food and Drug Administration (FDA), European Council Directive 76-768/EEC, and other global safety standards. ^{5,6} For further details, see Exposure Potential.
- Eye contact with propylene glycol may cause slight, temporary irritation. Prolonged skin contact is unlikely to result in absorption of harmful amounts. At room temperature, exposure to vapor is minimal due to low volatility. For further details, see Health Information or the relevant Safety Data Sheet.
- Propylene glycol is readily biodegradable, unlikely to accumulate in the food chain, and is practically non-toxic to fish and aquatic organisms. For further details, see Environmental Information.

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• DOW Propylene Glycol is stable under recommended storage conditions. Exposure to elevated temperatures can cause this product to decompose. Avoid contact with strong acids, strong bases, and strong oxidizers. For further details, see Physical Hazard Information.

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Manufacture of Product¹⁰

- Capacity The world production capacity for propylene glycols in 2010 was 1.6 million metric tons (3.5 billion pounds). This includes mono-, di-, and tripropylene glycols. The Dow Chemical Company is the major global producer of propylene glycols. Dow's 2010 estimated annual production capacity was 760,000 metric tons (1.7 billion pounds). Dow has propylene glycol production facilities in Altona, Australia; Aratu, Bahia, Brazil; Freeport, Texas and Plaquemine, Louisiana (USA); Map Ta Phut, Thailand; and Stade, Germany.
- Process Monopropylene glycol is produced by reacting propylene oxide with water. The chemical reaction appears below.

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Product Description^{11,12}

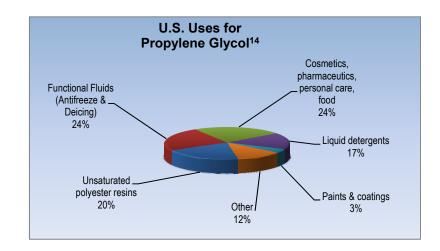
DOW™ Propylene Glycol, also called monopropylene glycol, is a viscous, colorless, odorless liquid. It does not evaporate (nonvolatile) at room temperature and is completely soluble in water. Dow manufactures propylene glycol industrial grade and a high-purity product called Propylene Glycol USP/EP.

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Product Uses 13,14

DOW™ Propylene Glycol is used in the following applications:

- · Antifreezes, coolants, and aircraft deicing fluids
- Heat transfer fluids
- Solvents
- Food
- Flavors and fragrances
- Cosmetics and personal care products
- Pharmaceuticals
- Chemical intermediates
- Hydraulic fluids
- Plasticizers
- · Thermoset plastic formulations



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Exposure Potential¹⁵

DOW™ Propylene Glycol is used in the production of industrial and consumer products. Based on the uses for propylene glycol, individuals could be exposed through:

• Workplace exposure – Exposure can occur in a propylene glycol manufacturing facility, during transport or in the various industrial or manufacturing facilities that use propylene glycol. It is produced, distributed, and stored in closed systems. Those working with propylene glycol in manufacturing operations could be exposed during maintenance, sampling, testing or other procedures. Each

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manufacturing facility should have a thorough training program for employees, appropriate work processes, and safety equipment in place to limit exposure. See Health Information.

- Consumer exposure to products containing DOW Propylene Glycol Dow does not sell propylene glycol for direct consumer use, but it is widely used in consumer product formulations such as liquid laundry detergents, pharmaceuticals, shampoos and shaving products, toothpaste, bath and shower products, baby wipes, cosmetics, deodorants, and many other personal care products. Always read the product information before use and follow the label/use instructions. DOW Propylene Glycol used for personal care products, pharmaceuticals, and food applications is a high-purity product that meets the global standards of the Food Chemical Codex (FCC), United States Pharmacopeia (USP), European Pharmacopeia (EP), Japanese Pharmacopeia (JP), Brazilian Pharmacopeia (FB), U.S. FDA, and European Council Directive 76/768/EEC. See Health Information.
- Environmental releases Small quantities of propylene glycol may be released into the environment if consumer products that contain them are poured down the drain. Because propylene glycol is completely soluble, once it is introduced to water, it will tend to remain dissolved in water. Because propylene glycol is readily biodegradable, it will be removed by sewage treatment plants. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Propylene glycol is practically nontoxic to fish and other aquatic organisms. See Environmental, Health and Physical Hazard Information.
- Large release Industrial spills or releases are infrequent and generally contained. If a large spill does occur, dike area to contain spill. Pump into suitable and properly labeled containers. Spilled material may cause a slipping hazard. Use appropriate safety equipment.
- In case of fire Isolate fire and deny unnecessary entry. Fight fire from a protected location, and consider the use of unmanned hose holders. Use a water fog or fine spray, dry chemical extinguisher, carbon dioxide (CO₂) extinguisher, or foam to fight fire. Alcohol-resistant foams are preferred. A direct water stream may spread the fire. Firefighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing. Follow emergency procedures carefully. See Environmental, Health and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

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Health Information¹⁶

Eye contact – Eye contact with propylene glycol may cause slight, temporary irritation. Corneal injury is unlikely. Contact with heated vapor or mist during manufacturing may cause eye irritation.

Skin contact – Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated exposure may cause softening and flaking of the skin.

Inhalation – At room temperature, exposure to vapor is minimal due to low volatility. Mist may cause irritation of upper respiratory tract (nose and throat).

Ingestion – This material has very low toxicity if swallowed. Harmful effects are not anticipated from swallowing small amounts.

Repeated exposure - In rare cases, repeated excessive exposure to propylene glycol may cause central nervous system effects.

Cancer information – Animal studies under exaggerated conditions have demonstrated no link to carcinogenicity. 17

For more information, see the relevant **Safety Data Sheet**.

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Environmental Information¹⁸

DOW™ Propylene Glycol is nonvolatile (does not evaporate). Because it is highly soluble in water, once introduced, it has a tendency to remain in water. It has minimal tendency to bind to soil or sediment.

Propylene glycol is unlikely to persist in the environment. Propylene glycol is readily biodegradable, which suggests the chemical will be rapidly and completely removed from water and soil environments, including biological wastewater treatment plants.

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Propylene glycol is not likely to accumulate in the food chain (bioconcentration potential is low) and is practically nontoxic to fish and other aquatic organisms on an acute basis.

The OECD SIDS Initial Assessment Report for 1,2-Dihydroxypropane (propylene glycol) concluded that, based on the known properties and exposure patterns, the chemical is currently considered of low potential risk to the environment, and low priority for further work.

For more information, see the relevant Safety Data Sheet.

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Physical Hazard Information¹⁹

DOW™ Propylene Glycol is stable under recommended storage and use conditions. Exposure to elevated temperatures can cause this product to decompose. Protect from atmospheric moisture and store away from direct sunlight.

Avoid contact with strong acids, strong bases, and strong oxidizers. Spilled material may cause a slipping hazard.

For more information, see the relevant Safety Data Sheet.

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Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use and/or disposal of DOW™ Propylene Glycol. These regulations may vary by city, state, country or geographic region. Information may be found by consulting the relevant <u>Safety Data</u> Sheet, Technical Data Sheet, or Contact Us.

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Additional Information

- Safety Data Sheet (<u>www.dow.com/propyleneglycol/resources/technical_information/safety_data_sheets.htm</u>) or contact the <u>Dow</u> Customer Information Group at (www.dow.com/assistance/dowcig.htm)
- Contact Us (www.dow.com/propyleneglycol/contact/)
- Chinn, Henry, Lochner, Uwe, and Nakamura, Issho, K., "CEH Product Review: Propylene Glycols," *Chemical Economics Handbook*, SRI Consulting, January 2008
- Screening Information Data Set (SIDS) Initial Assessment Report for SIAM 11 1,2-Dihydroxypropane CAS: 57-55-6, Organisation for Economic Co-operation and Development (OECD), United Nations Environment Programme (UNEP): Orlando, FL, USA, January 23-26, 2001 (http://www.inchem.org/documents/sids/sids/57-55-6.pdf)

For more business information about DOW™ Propylene Glycol, visit the Propylene Glycols web site at www.dow.com/propyleneglycol/.

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References

- ¹ Propylene Glycol Industrial Grade Material Safety Data Sheet, The Dow Chemical Company, October 9, 2012, Hazards Identification.
- Propylene Glycol USP/EP Material Safety Data Sheet, The Dow Chemical Company, October 10, 2011, Hazards Identification.
- ³ Chinn, Henry with Kumamoto, Takashi, "CEH Product Review: Propylene Glycols," *Chemical Economics Handbook*, SRI Consulting, July 2011, page 8.
- ⁴ Dow Propylene Glycol Applications web page www.dow.com/propyleneglycol/app/.
- Propylene Glycol Industrial Grade Material Safety Data Sheet, The Dow Chemical Company, October 9, 2012, Firefighting Measures, Accidental Release Measures, Handling and Storage, Exposure Controls.
- ⁶ Dow Propylene Glycols Fragrance, Cosmetics, and Personal Care web page www.dow.com/propyleneglycol/app/fragranc.htm.
- ⁷ Propylene *Glycol Industrial Grade Material Safety Data Sheet*, The Dow Chemical Company, October 9, 2012, Hazards Identification, Toxicological Information.
- Screening Information Data Set (SIDS) Initial Assessment Report for SIAM 11 1,2-Dihydroxypropane CAS: 57-55-6, Organisation for Economic Co-operation and Development (OECD), United Nations Environment Programme (UNEP): Orlando, FL, USA, January 23-26, 2001, page 3.
- Propylene Glycol Industrial Grade Material Safety Data Sheet, The Dow Chemical Company, October 9, 2012, Stability and Reactivity.
- ¹⁰ Chinn, Henry with Kumamoto, Takashi, "CEH Product Review: Propylene Glycols," *Chemical Economics Handbook*, SRI Consulting, July 2011, page 7.
- ¹¹ Propylene Glycol Industrial Grade Material Safety Data Sheet, The Dow Chemical Company, October 9, 2012, Hazards Identification.
- ¹² Propylene Glycol USP/EP Material Safety Data Sheet, The Dow Chemical Company, October 10, 2011, Hazards Identification.
- ¹³ Dow Propylene Glycols About Propylene Glycols web page: www.dow.com/propyleneglycol/about/.
- ¹⁴ Chinn, Henry with Kumamoto, Takashi, "CEH Product Review: Propylene Glycols," *Chemical Economics Handbook*, SRI Consulting, July 2011, page 23.
- ¹⁵ Propylene Glycol Industrial Grade Material Safety Data Sheet, The Dow Chemical Company, October 9, 2012, Firefighting Measures, Accidental Release Measures, Handling and Storage, Exposure Controls.
- ¹⁶ Propylene Glycol Industrial Grade Material Safety Data Sheet, The Dow Chemical Company, October 9, 2012, Hazards Identification, Toxicological Information.
- ¹⁷ SIAR for SIAM 11 1,2-Dihydroxypropane CAS: 57-55-6, OECD, UNEP: Orlando, FL, USA, January 23-26, 2001, page 3.
- ¹⁸ Propylene Glycol Industrial Grade Material Safety Data Sheet, The Dow Chemical Company, October 9, 2012, Ecological Information.
- ¹⁹ Propylene Glycol Industrial Grade Material Safety Data Sheet, The Dow Chemical Company, October 9, 2012, Handling and Storage, Stability and Reactivity.

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NOTICES

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