Product Safety Assessment

**DOW™ n-Propanol**

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**Names**

- CAS No. 71-23-8
- n-Propanol
- n-Propyl alcohol
- DOW™ n-propanol
- EC No. 200-746-9
- 1-Propanol
- Ethyl carbinol
- Propanol
- 1-Hydroxypropane

**Product Overview**

- DOW™ n-propanol is a colorless liquid with a very mild odor. It is soluble in water as well as common organic solvents. DOW n-propanol is not considered a hazardous air pollutant (HAP) solvent by the U.S. Environmental Protection Agency.¹ ² For further details, see **Product Description**.

- Due to its excellent solvent properties, DOW n-propanol is used in a broad range of applications, including printing-ink formulations, coatings, dispersing agents, pesticide formulations, and many others. It is a chemical building block for the manufacture of esters, propyl amines, and halides. Because of its relative inertness and low odor, this material is also used for packaging and food-contact applications.¹ ³ For further details, see **Product Uses**.

- DOW n-propanol is not sold for direct consumer use. Worker exposure can occur either in a manufacturing facility or in the various industrial or manufacturing facilities that use this material. Workplace exposure is minimized through engineering controls and personal protective equipment.² For further details, see **Exposure Potential**.

- Eye contact with n-propanol may cause severe irritation with corneal injury, which may result in permanent impairment of vision, even blindness. Prolonged skin contact is not likely to cause irritation or result in absorption of harmful amounts. Brief skin contact may cause drying and flaking of the skin, and potential aggravation of existing dermatitis. Prolonged excessive inhalation may cause adverse effects. This material can result in damage if aspirated into the lungs.² See **Health Information** or **Physical Hazard Information**.

- n-Propanol liquid and vapors are flammable. Vapors are heavier than air and can travel long distances creating an explosion hazard. Eliminate sources of ignition. Avoid contact with aldehydes, halides, halogenated organics, halogens, strong acids, and strong oxidizers.² For further details, see **Physical Hazard Information**.

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Manufacture of Product

- **Capacity** – DOW™ n-propanol is manufactured at the Texas City, Texas (U.S.) production facility.
- **Process** – n-Propanol is made by the hydrogenation of propionaldehyde, which in turn is made from the reaction of ethylene with synthesis gas. The reaction series is shown below.

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\begin{align*}
\text{Ethylene} & \quad + \quad \text{CO/H}_2 & \quad \rightarrow & \quad \text{H}_3\text{CCH}_2\text{C}^=\text{O} & \quad + \quad \text{H}_2 & \quad \rightarrow & \quad \text{H}_3\text{CCH}_2\text{CH}_2\text{OH} \\
\text{Synthesis Gas} & \quad & \quad & \quad & \quad & \quad & \\
\text{Propionaldehyde} & \quad & \quad & \quad & \quad & \quad & \\
\text{Hydrogen} & \quad & \quad & \quad & \quad & \quad & \\
\text{n-Propanol} & \quad & \quad & \quad & \quad & \quad & 
\end{align*}
\]

Product Description

DOW™ n-propanol is a colorless liquid with a very mild odor. It is completely soluble in water. Common organic solvents such as glycols, ketones, alcohols, aldehydes, ethers, and aromatic and aliphatic hydrocarbons are also soluble in DOW n-propanol. Compared to other alcohols, DOW n-propanol has a much milder odor. Although DOW n-propanol is volatile (evaporates easily), it is not considered a hazardous air pollutant (HAP) solvent by the U.S. Environmental Protection Agency and does not contribute to lower level smog formation.

Product Uses

n-Propanol is an industrial chemical used in the following applications:

- Flexographic and rotogravure ink formulations – used directly or converted to n-propyl acetate for use as an ink solvent for inks used for food-packaging and other food-contact applications due to its low odor
- Surface coatings solvent
- Chemical intermediate – as a chemical building block for glycol ethers (solvents), n-propylamines and n-propyl esters (insecticides and herbicides), and n-propyl acetate (inks)
- Dispersing agent – in cleaning preparations and floor wax
- Metal degreasing fluids
- Adhesives
- Processing (extraction) solvent – for pharmaceuticals

Exposure Potential

n-Propanol is an industrial solvent and chemical intermediate. Based on the uses for this material, the public could be exposed through:

- **Workplace exposure** – DOW™ n-Propanol is manufactured in a closed system using engineering controls that prevent the escape of liquid or vapors and minimize release to the environment. Worker exposure could occur in a facility, or in other facilities that use it. Facilities that manufacture or use this material should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.
- **Consumer exposure to products containing n-propanol** – DOW™ n-propanol is not sold for direct consumer use. However, it may be present in certain household floor waxes,
cleaning formulations, insecticides, and varnishes. n-Propanol is also used as a carrier solvent for some printing inks used for food-contact applications. See Health Information.

- **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Use appropriate personal protective equipment when cleaning up spills and leaks. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, contain the spill if possible. Isolate the area, keeping upwind of spill. Eliminate all sources of ignition. Ground and bond all handling equipment. If available, use foam to smother or suppress fumes. Pump with explosion-proof equipment into suitable and properly labeled containers. Use appropriate safety equipment and follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Keep people away. Deny any unnecessary entry into the area. Use water fog or fine spray, dry-chemical or carbon-dioxide fire extinguishers, or foam. Alcohol-resistant foams are preferred. Do not use a direct water stream. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. n-Propanol vapors are heavier than air and can travel long distances accumulating in low-lying areas. Ignition or flashback may occur. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

### Health Information

**Eye Contact** – Eye contact with n-propanol may cause severe irritation with corneal injury possibly resulting in permanent impairment of vision, even blindness. Chemical burns may occur. Vapor may cause eye irritation experienced as mild discomfort and redness.

**Skin Contact** – Prolonged skin contact is not likely to cause significant skin irritation. Skin contact may cause drying and flaking of the skin, and potential aggravation of existing dermatitis. The response may be more severe if spilled material is confined under clothing or gloves. Prolonged skin contact is not likely to result in absorption of harmful amounts.

**Inhalation** – Prolonged excessive inhalation of n-propanol may result in adverse effects. Respiratory irritation and central nervous system depression along with headache, dizziness, and drowsiness may occur. Prolonged excessive inhalation could progress to lack of coordination and unconsciousness.

**Ingestion** – Low toxicity if swallowed. Swallowing small amounts of n-propanol incidental to normal handling operations is not likely to cause injury. However, swallowing larger amounts may cause injury. Aspiration into the lungs could occur during ingestion or vomiting, causing lung damage or death due to chemical pneumonia.

**Effects of repeated overexposure** – Animal studies have shown prolonged or repeated exposure to high concentrations of n-propanol can affect the central nervous system and liver. At extremely high concentrations, this material has been reported to cause birth defects in rats. In animal studies, has been shown to interfere with fertility in males; however, the effects were reversible. These concentrations exceed relevant human dose levels.

For more information, see the relevant Safety Data Sheet.

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Environmental Information

n-Propanol is readily biodegradable and not likely to accumulate in the food chain (bioconcentration potential is low). This material is practically non-toxic to fish and other aquatic organisms on an acute basis (exposure to a single, large concentration).

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

n-Propanol liquid and vapor are combustible. It is a vapor explosion hazard. n-Propanol vapors are heavier than air and may travel long distances, collecting in low-lying areas. Ignition or flashback could occur. Keep away from sources of ignition, including static discharge. n-Propanol is thermally stable under typical conditions of use. Exposure to elevated temperatures can cause the material to decompose.

n-Propanol is incompatible with aldehydes, halides, halogenated organics, halogens, strong acids, and strong oxidizers. Contact with these materials should be avoided.

For more information, see the relevant Safety Data Sheet.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of n-propanol. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Data Sheet, or Contact Us.

Additional Information

- Safety Data Sheet (http://www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (http://www.dow.com/oxysolvents/contact/index.htm)
- n-Propanol, Technical Data Sheet, The Dow Chemical Company, Form No. 327-00013-0812, August 2012 (http://msdssearch.dow.com/PublishedLiteratureDOWCOM/dh_08ac/0901b803808aca4b.pdf?filepath=oxysolvents/pdfs/noreq/327-00013.pdf&fromPage=GetDoc)

References

1. *n-Propanol, Technical Data Sheet*, The Dow Chemical Company, Form No. 327-00013-0812
2. *n-Propanol Safety Data Sheet for the US*, The Dow Chemical Company

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