Propylene Glycol-Propoxylated Polyols/Poly(Propylene Glycol)


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Names
- CAS No. 25322-69-4
- Propylene glycol propoxylated polyl
- Propylene oxide-propylene glycol polymer
- Poly(propylene glycol)
- Polyoxypropylene ether
- PPG

Various VORANOL™ polyols, including, for example:
- VORANOL 2000L polyl
- VORANOL 2110-TB
- VORANOL 2140
- VORANOL WD 2130
- VORANOL 1010L
- VORANOL P 400
- VORANOL 220-110 polyl
- VORANOL 2120
- VORANOL WD 2104
- VORANOL 220-056
- VORANOL 4000

Product Overview
- Propylene glycol-propoxylated polyols are clear, low to medium viscosity liquids with a slightly sweet odor. These products belong to a category of materials called polyether polyols and are produced by reacting propylene glycol with propylene oxide. The Dow Chemical Company and its global affiliates market a variety of these polyols of different molecular weights and properties under the trade name VORANOL™ polyols. In other industries, these products can be marketed as P-series polyglycols. For further details, see Product Description.
- Propylene glycol-propoxylated polyols are primarily used as chemical building blocks in the manufacture of flexible, standard, and high-resilience polyurethane additives and sealants. For further details, see Product Uses.
- Exposure can occur either in facilities that manufacture these polyols or in the various industrial or manufacturing facilities that use these products. Propylene glycol-propoxylated polyols are not sold directly to consumers and are not expected to represent a risk to consumers. For further details, see Exposure Potential.

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- Eye contact may cause slight, temporary irritation. Brief skin contact is essentially nonirritating. Prolonged skin exposure is not likely to cause significant irritation or result in absorption of harmful amounts. Exposure to vapor is expected to be minimal due to the low volatility of these products. These products have very low toxicity if swallowed. For further details, see Health Information.
- Propylene glycol-propoxylated polyols are expected to biodegrade slowly in the environment. They are nonvolatile and water soluble, so environmental releases would tend to migrate toward or remain in water. These polyols would not persist in the environment and would be removed by biological wastewater-treatment facilities. The bioconcentration potential of these products is low. They are practically nontoxic to aquatic organisms. For further details, see Environmental Information.
- Propylene glycol-propoxylated polyols are stable under recommended storage and normal use conditions. Avoid contact with oxidizing materials, strong acids, and strong bases. For further details, see Physical Hazard Information.

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Manufacture of Product
- **Capacity** – The Dow Chemical Company and its global affiliates are major producers of propylene oxide, one of the materials used to manufacture polyether polyols, and is also the world’s largest producer of polyether polyols. In 2011, Dow’s global capacity to produce polyether polyols was 1,494,000 metric tonnes (3.3 billion pounds) of polyether polyols. Dow polyols are manufactured at facilities in Temse, The Netherlands; Tarragona, Spain; Tertre, Belgium; Cartagena, Columbia; Guaruja, Brazil; San Lorenzo, Argentina; Freeport, Texas, United States; Altona, Australia; Map Ta Phut, Thailand; Nankang, Taiwan; and Ningbo, People’s Republic of China.
- **Process** – Propylene glycol is reacted with propylene oxide as shown in the reaction below. Propylene glycol is the initiator.

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Product Description
Propylene glycol-propoxylated polyols are colorless, clear, low to medium viscosity liquids with a slightly sweet odor and are hygroscopic (attract water from the atmosphere and environment). The Dow Chemical Company and its global affiliates market these products under the trade names VORANOL™ polyols. In other industries, these products are marketed as P-series polyglycols.

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Product Uses
Propylene glycol-propoxylated (polyether) polyols are reacted with isocyanates to produce polyurethane based products. Primary uses include:
- Low and medium molecular weight (MW) in combination with other polyol for rigid polyurethane foams for thermal insulation in appliances and construction applications
- Medium and high MW for the production of prepolymers for coatings, inks, industrial and flexible packaging adhesives, sealants, elastomers and other applications.

Other uses for these polyols are in transesterification synthesis for urethane acrylate and silane capping reactions.
Exposure Potential

Propylene glycol-propoxylated polyols are used in the production of industrial and consumer products. Based on the uses for this product, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in facilities that manufacture propylene glycol-propoxylated polyols or in the various industrial or manufacturing facilities that use these polyols. They are produced, distributed, stored, and consumed in closed systems. Those working with these polyols in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each manufacturing facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit exposure. See Health Information.

- **Consumer exposure to products containing propylene glycol-propoxylated polyols** – These polyols are not sold directly to consumers; however, goods used by consumers may incorporate these products in cured form. Contact with the cured polyurethane product would not be expected to represent a risk. See Health Information.

- **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil, surface water, or groundwater. Small spills should be absorbed with dirt, sand, or sawdust. Material spilled on concrete and metal surfaces may cause a slipping hazard. These products are nonvolatile and water soluble, so environmental releases would tend to migrate toward or remain in water. They would not persist in the environment and would be removed by biological wastewater-treatment facilities. The bioconcentration potential of these products is low. These products are practically nontoxic to aquatic organisms on an acute basis. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. An approved respirator is recommended for emergency work. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Deny any unnecessary entry into the area and consider the use of unmanned hose holders. Use water spray or fog, carbon-dioxide or dry-chemical extinguishers, or foam to fight the fire. Alcohol-resistant foams are preferred. Use of a direct water stream may spread the fire. Containers may rupture from gas generation during a fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Keep fire water out of waterways and sewers to minimize the potential for environmental damage. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, request the Safety Data Sheet from the Dow Customer Information Group.
Environmental Information

Propylene glycol-propoxylated polyols are expected to biodegrade in the environment (passes OECD screening tests for ready biodegradability). They are nonvolatile and water soluble, so environmental releases would tend to migrate toward or remain in water. They would not persist in the environment and would be removed by biological wastewater-treatment facilities. The bioconcentration potential (tendency to accumulate in the food chain) for these products is low.

These polyols are practically nontoxic to aquatic organisms (LC50/EC50 >100 mg/L for the most sensitive species tested).

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

Physical Hazard Information

Propylene glycol-propoxylated polyols are stable under recommended storage and normal use conditions. These products can oxidize at elevated temperatures leading to gas generation and possible pressure build-up. Avoid contact with oxidizing materials, strong acids, and strong bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

Spills of these products on hot, fibrous insulation may reduce the autoignition temperature, increasing the potential for spontaneous combustion.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of Propylene glycol-propoxylated polyols. 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

- Request the Safety Data Sheet from the Dow Customer Information Group (www.dow.com/assistance/dowcig.htm)
- Contact Us (www.dow.com/polyurethane/contact/index.htm)
- Technical Data Sheets (www.dow.com/polyurethane/products/)

For more business information about glycerine-propoxylated-ethoxylated polyols, visit the Dow Polyurethanes website at www.dow.com/polyurethane/.

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