Product Safety Assessment

Toluenediamine Propoxylated Polyols

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Names
- CAS No. 63641-63-4
- CAS No.1228577-90-9
- ortho-Diaminotoluene, propoxylated
- o-Diaminotoluene, propoxylated (>1 - <8.5 mol)
- TERCAROL™ 5903 polyether polyol
- Toluenediamine polyoxypropylene ether
- Toluenediamine propoxylated polyol

Product Overview
- Toluenediamine propoxylated polyols are yellow to red viscous liquids. They are practically odorless. These materials belong to a category of materials called polyether polyols and are produced by reacting ortho-toluenediamine (o-TDA) with propylene oxide. Dow markets these polyols under the trade name TERCAROL™ polyether polyol. For further details, see Product Description.
- Toluenediamine propoxylated polyols are used as chemical building blocks in the manufacture of rigid polyurethane foams. For further details, see Product Uses.
- Exposure to toluenediamine propoxylated polyols could occur at a production facility for these polyols or at facilities that use these materials to manufacture other products. These polyols are manufactured for industrial use, making direct consumer exposure unlikely. See Exposure Potential.
- Toluenediamine propoxylated polyols may cause moderate irritation to the eyes, but corneal injury is unlikely. They are stable under recommended storage conditions. Avoid contact with oxidizing materials and strong acids and bases. Avoid unintended contact with isocyanates. Because of their low vapor pressure, these products are not likely to be inhaled when handled at room temperature. Vapor from heated materials may cause respiratory irritation. For further details, see Health Information or Physical Hazard Information.
- Toluenediamine propoxylated polyols are expected to biodegrade slowly in the environment and are practically nontoxic to fish. For further details, see Environmental Information.

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Product Safety Assessment: Toluenediamine Propoxylated Polyols

Manufacture of Product

- Process – Dow produces toluenediamine propoxylated polyols by reacting ortho-Toluenediamine (o-TDA) with propylene oxide as shown in the reaction below. o-TDA is the initiator in this reaction.

\[
\text{o-Toluenediamine} + 4m \text{Propylene oxide} \rightarrow \text{Amine-terminated polyol}
\]

Product Description

Toluenediamine propoxylated polyols are yellow to red viscous liquids. They are practically odorless and are slightly hygroscopic (attract water from the atmosphere and environment). The benefit of these polyols is that due to active amine initiator, when blended with other polyols, they require less additional catalyst for reaction. The Dow Chemical Company markets these products under the trade name TERCAROL® polyether polyol.

Product Uses

Toluenediamine propoxylated polyether polyols are mainly reacted with isocyanates to produce rigid polyurethane foams.

Exposure Potential

Toluenediamine propoxylated polyols are manufactured for industrial use only. Based on the uses for these materials, the public could be exposed through:

- Workplace exposure – Exposure can occur either in a production facility for these polyols or in the various industrial or manufacturing facilities that use these polyols or products that contain them. Those working with 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 and safety equipment in place to limit unnecessary exposure. See Health Information.

- Consumer exposure to products containing toluenediamine propoxylated polyols – Because these polyols are used as chemical building blocks for the manufacture of other products, direct consumer exposure is unlikely. There would be very little or no unreacted polyol in the polyurethane products produced. See Health Information.

- Environmental releases – In the event of a spill, the focus is on containing the spill to prevent contamination of soil, surface or ground water. At ambient temperatures, polyols are

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practically nonvolatile, making evaporation to the atmosphere unlikely. Spills of polyol on tile, concrete or metal surfaces can cause slipping hazards. For small spills, polyols should be absorbed with materials such as sand or soil, then swept up for disposal according to governmental requirements. See Environmental, Health and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and are generally contained. If a large spill does occur, the material should be contained by creating ditches or dikes. The polyol can then be transferred to containers for disposal. The remaining spill may be absorbed with absorbent materials such as sand or soil, cleaned up, and disposed of according to governmental requirements. Personnel engaged in clean up of spills should observe proper skin and eye protection practices.

- **In case of fire** – Fires involving polyols can be readily extinguished with water fog or water spray or carbon dioxide, alcohol-resistant foam, or dry-chemical extinguishers. Because incomplete combustion may lead to the build-up of toxic by-products, firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA). Emergency procedures should be followed carefully. See Environmental, Health and Physical Hazard Information.

For more information, request the relevant Safety Data Sheet.

**Health Information**

Health information for toluenediamine propoxylated polyols is summarized on the relevant Safety Data Sheets. The Safety Data Sheet is the preferred source for specific health information. An overview of health information for toluenediamine propoxylated polyols appears below:

- **Eye contact** - Toluenediamine propoxylated polyols may cause moderate irritation to the eyes, but corneal injury is unlikely.

- **Skin Contact** - Prolonged exposure of Toluenediamine propoxylated polyols is not likely to cause significant skin irritation. Repeated contact may cause skin irritation with local redness. Prolonged skin contact is unlikely to result in absorption of harmful amounts. Toluenediamine propoxylated polyols did not cause allergic skin reactions when tested in laboratory animals.

- **Inhalation** - Because of their low vapor pressure, these products are not likely to be inhaled when handled at room temperature. Vapor from heated materials may cause respiratory irritation.

- **Ingestion** - Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

For more information, request the relevant Safety Data Sheet.

**Environmental Information**

Toluenediamine propoxylated polyols are water soluble and nonvolatile. If released to the environment, they will have a tendency to remain in water with minimal tendency to bind to soil or sediment.

Although these material cannot be considered as readily biodegradable, Toluenediamine propoxylated polyols polyols are not expected to persist indefinitely in the environment. They are inherently biodegradable, which suggests that they will likely be removed in biological wastewater treatment facilities as well as in other water and soil environments.
Toluenediamine propoxylated polyols are not likely to accumulate in the food chain (bioconcentration potential is low), due to their high water solubility and high molecular weight.

Propoxylated/ethoxylated ethylenediamine polyols are practically non-toxic to fish and other aquatic organisms on an acute basis (LC50/EC50 > 100 mg/L in the most sensitive species tested). For more information, request the relevant Safety Data Sheet.

**Physical Hazard Information**

Toluene diamine propoxylated polyols are stable under recommended storage conditions. Avoid contact with oxidizing materials (such as peroxides or hypochlorite salts), strong acids and bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

Fires involving polyols can be readily extinguished with water fog or fine spray or carbon dioxide, alcohol-resistant foam, or dry-chemical extinguishers. Evacuate personnel and deny unnecessary entry. Because incomplete combustion may lead to the build-up of toxic by-products, firefighters should wear positive-pressure, self-contained breathing apparatus.

For more information, request the relevant Safety Data Sheet.

**Regulatory Information**

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of toluenediamine 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**

- **TERCAROL™ 5903 Polyol, Material Safety Data Sheet**, The Dow Chemical Company, (request using Contact Us at [http://www.dow.com/polyurethane/contact/index.htm](http://www.dow.com/polyurethane/contact/index.htm))

For more business information about toluenediamine propoxylated polyols and related products, visit Dow’s Polyurethanes web site at: [www.polyurethanes.com](http://www.polyurethanes.com).

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