Product Safety Assessment

VITHANE™ Resins in Toluene

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Names
- VITHANE™ resin in toluene
- VITHANE 203 resin
- VITHANE 230 resin
- VITHANE 254 resin
- VITHANE 280 resin
- VITHANE 373 resin
- VITHANE BA 742 resin
- VITHANE BA 745 resin
- VITHANE BA 753 resin
- VITHANE BA 6056 resin

Product Overview
- VITHANE™ resins in toluene are a family of polyurethane elastomers manufactured and marketed by Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, and its affiliated companies. “Elastomers” are resilient polymers that can bend or stretch and then return to their original shape. VITHANE resins in toluene are formulated as colorless to yellow, viscous liquids. VITHANE resins in toluene may also contain dimethylformamide or other organic solvents depending on formulation and intended use.1 For further details, see Product Description.
- VITHANE resins in toluene are used in the production of synthetic leather. Footwear, apparel, and furniture are manufactured from synthetic leathers made with these VITHANE products.2 For further details, see Product Uses.
- VITHANE resins are for commercial use. Worker exposure is possible during manufacture, transport, or application. Consumers may purchase finished goods, such as footwear or apparel, manufactured with VITHANE resins.3 For further details, see Exposure Potential.
- The following health information refers to the liquid resin formulations encountered during manufacturing. As these resins cure (solidify), the carrier solvent (blend of toluene with dimethylformamide or other organic solvents) is removed, and the resins form a flexible plastic adhesive. Contact with solvent vapor or mist during processing can cause irritation to the eyes and skin. The solvents in these products can be harmful if absorbed through intact skin. Excessive inhalation of solvent vapor or mist during processing may irritate the nose, throat, and lungs. Dizziness, drowsiness, headache, or nausea are also possible.4,5 For further details, see Health Information.
- The solvents used in VITHANE resins are readily biodegradable, have a low tendency to accumulate in the food chain (bioconcentration potential is low), and range from toxic to

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practically nontoxic to aquatic organisms on an acute basis. The polyurethane resins are expected to slowly degrade in the environment. Due to their high molecular weight, the resins are not expected to accumulate in the food chain, and they are not expected to be toxic to fish or other aquatic organisms. For further details, see Environmental Information.

- **VITHANE™** resins in toluene are stable under recommended storage and normal use conditions. Toluene liquid and vapor are highly flammable. Toluene vapor is heavier than air and can travel long distances and accumulate in low-lying areas. Ignition or flashback could occur. Store and use these products away from potential ignition sources. Avoid contact with strong oxidizing agents. For further details, see Physical Hazard Information.

**Manufacture of Product**

- **Locations** – A foreign affiliated company of Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, produces VITHANE™ resins at facilities in Mozzate, Italy.
- **Process** – VITHANE resins in toluene are formulated in batch operations using proprietary Rohm and Haas materials and technology.

**Product Description**

VITHANE™ polyurethane resins in toluene are formulated as colorless to yellow viscous liquids. These products may also contain dimethylformamide or other organic solvents. The solvents are removed during processing to make consumer goods. Cured (solidified) VITHANE resins are strong, flexible polyurethane adhesives and basecoats.

**Product Uses**

VITHANE™ resins in toluene are used as adhesives or basecoats in the production of synthetic leathers and in the textile industry, especially to bond fabric to synthetic leather. Synthetic leathers made with VITHANE resins are used for the following applications:

- Footwear (e.g., uppers for shoes and safety shoes)
- Upholstery – furniture (e.g., sofa), automotive (e.g., dashboard, gearshift, etc.)
- Apparel and accessories (e.g., handbags, belts, etc.)
- Bags, linings, general purpose
- Garments (e.g., labels, jackets, etc.)

**Exposure Potential**

VITHANE™ resins in toluene are used in the production of synthetic leather. Based on this, the public could be exposed through:

- **Workplace exposure** – Exposure can occur in facilities that manufacture these resins, during transport, or during synthetic leather manufacture. VITHANE resins in toluene are produced, distributed, and stored in closed systems. Those working with VITHANE resins 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 VITHANE™ resins in toluene – These liquid resin formulations are not sold directly to consumers. Synthetic leather manufactured with VITHANE resins may be used to manufacture footwear, apparel, or other consumer goods. Consumers would contact only the cured resin, which is considered harmless. See Health Information.

Environmental releases – Due to the use pattern for these VITHANE resins, releases to the environment are expected to be minimal. In the event of a spill, the focus is on immediate containment to prevent contamination of soil, surface water, or groundwater. If released, the solvents used in these products will exhibit low to moderate tendencies to volatilize from water. In air, the solvents will degrade within days from exposure to photochemically produced hydroxyl radicals. Since these compounds are readily biodegradable, they are expected to be removed from water and soil environments, including biological wastewater-treatment facilities. The polyurethane resins will tend to float in water and will be removed in wastewater-treatment facilities by adsorption to biosolids. 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 the area with sand or soil to contain the spill. Evacuate personnel upwind and away from the spill or leak. Ventilate the area. Ground and bond all containers and handling equipment and extinguish all potential ignition sources. No sparking tools should be used. Clean-up personnel must wear appropriate personal protective equipment. Spilled product can create slippery conditions. Collect spilled product in suitable and properly labeled containers. See Environmental, Health, and Physical Hazard Information.

In case of fire – Evacuate personnel and deny unnecessary entry. Use alcohol-resistant foam, carbon-dioxide (CO₂) or dry-chemical extinguishers, or a fine water spray or mist to fight the fire. A direct water stream may spread the fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Solvent vapor is heavier than air and can travel long distances and accumulate in low-lying areas. Ignition or flashback could occur. 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.

Health Information

Health information for VITHANE™ resins in toluene is summarized on the relevant Safety Data Sheets. It is important to note that health risks associated with individual products may vary based on their formulation or intended use. These products may contain minor components or additives with additional health risks. The Safety Data Sheet is the preferred source for specific information. The following health information refers to the polyurethane resin in toluene and/or dimethylformamide or other organic solvents encountered during manufacturing. The resulting fully cured polyurethane resin is a solid adhesive that is considered harmless.

Eye contact – Contact with solvent vapor or mist during processing may cause eye irritation.

Skin contact – Contact may cause skin irritation. Repeated contact may lead to drying and flaking of the skin. The solvents in these products can be harmful if absorbed through intact skin.

Inhalation – Inhalation of solvent vapor or mist during processing can cause irritation of the nose, throat, and lungs. Other symptoms may include headache, nausea, dizziness, drowsiness, vomiting, or weakness. Prolonged exposure to high inhalation concentrations may lead to more serious damage to health, including defects in vision, speech, and hearing that may become permanent.
**Ingestion** – These products may be harmful if swallowed. Aspiration into the lungs during ingestion or vomiting may lead to chemical pneumonia, lung damage, or even death.

**Repeated exposure** – Prolonged or repeated overexposure to toluene can irritate the respiratory tract, damage the liver and kidneys, and cause cardiac sensitization. Repeated overexposure to dimethylformamide can cause liver damage.

**Reproductive effects** – Reproductive effects have been reported in pregnant toluene inhalant abusers following very high (intentional abuse) exposures. In animal studies, evidence of developmental toxicity has been observed, but no teratogenicity or significant effects on fertility have been observed. Reproductive and developmental toxicity have been observed generally in the presence of maternal toxicity in animals exposed to dimethylformamide.

For more information, request the Safety Data Sheet from the [Dow Customer Information Group](#).

**Environmental Information**\textsuperscript{15,16,17}

The solvents used in VITHANE™ resins in toluene exhibit a range of volatility and water solubility. When introduced, the solvents will have a low to moderate tendency to evaporate from water with minimal tendency to bind to soil and sediment. The polyurethane resins are insoluble and will tend to float in water and bind to soil or sediment.

The solvents used in these VITHANE formulations are unlikely to persist in the environment. In the atmosphere, the solvents will degrade within days by reaction with photochemically produced hydroxyl radicals. The solvents are readily biodegradable, which suggests that they will be removed from water and soil environments, including biological wastewater-treatment facilities. Although the polyurethane resins are essentially nonbiodegradable, they are expected to slowly degrade in the environment, including degradation by physical action or exposure to sunlight. The resins would likely be removed in wastewater-treatment facilities by adsorption to biosolids.

The solvents used in these VITHANE formulations are not likely to accumulate in the food chain (bioconcentration potential is low) and range from toxic to practically nontoxic to fish and other aquatic organisms on an acute basis. The polyurethane resins are not expected to accumulate in the food chain due to their high molecular weight, and they are not expected to be toxic to fish or other aquatic organisms.

For more information, request the Safety Data Sheet from the [Dow Customer Information Group](#).

**Physical Hazard Information**\textsuperscript{18}

VITHANE™ resins in toluene are stable under recommended storage and normal use conditions. These products are flammable and should be stored and used away from potential ignition sources. Toluene vapor is heavier than air and can travel long distances and accumulate in low-lying areas. Ignition or flashback could occur. Ground and bond all containers and handling equipment before transferring or using these products. Avoid contact with strong oxidizing agents.

For more information, request the 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 VITHANE™ resins in toluene. 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.

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Additional Information

- Request the relevant Safety Data Sheet from the Dow Customer Information Group (www.dow.com/assistance/dowcig.htm)
- Contact Us (www.dow.com/assistance/thoughts.htm)
- VITHANE™ Resins Product Line Leaflet, ed 6, Rohm and Haas Europe Services, April 2011

For more business information about VITHANE™ resins in toluene, contact the Dow Customer Information Group at www.dow.com/assistance/dowcig.htm.

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References

2. VITHANE™ Resins Product Line Leaflet, ed 6, Rohm and Haas Europe Services, April 2011.
10. VITHANE™ Resins Product Line Leaflet, ed 6, Rohm and Haas Europe Services, April 2011.
NOTICES:

As part of its 2015 Sustainability Goals, Dow has committed to make publicly available safety assessments for its products globally. This product safety assessment is intended to give general information about the chemical (or categories of chemicals) addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the relevant Safety Data Sheet, which should be consulted before use of the chemical. This product safety assessment does not replace required communication documents such as the Safety Data Sheet.

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Form No. 233-00916-MM-0712