Product Safety Assessment

Toluene/Xylene Mix

Select a Topic:
- Names
- Product Overview
- Manufacture of Product
- Product Description
- Product Uses
- Exposure Potential
- Health Information
- Environmental Information
- Physical Hazard Information
- Regulatory Information
- Additional Information
- References

Names
- CAS No. 68516-20-1
- Petroleum naphtha, steam-cracked, middle aromatic
- Toluene/xylene mix
- Blend TN100

Product Overview
- Toluene/xylene mix is a mixture of mainly unsaturated C7 to C8 hydrocarbons that range from clear to yellow in color and have a moderate to strong aromatic or camphor-like odor. This product originates from high-temperature cracking of petroleum fractions and is separated during the recovery of benzene from pyrolysis gasoline.\(^1\) For further details, see Product Description.
- Toluene/xylene mix produced by The Dow Chemical Company is used as a chemical intermediate for the production of benzene and other industrial chemicals. This product may also be used for blending into gasoline sold as motor fuel.\(^2\) For further details, see Product Uses.
- This product is only sold for industrial use and not for consumer use. The most likely exposure to toluene/xylene mix in the workplace is by inhalation of vapor that might escape from the otherwise closed process. Proper ventilation should ensure that airborne concentrations remain below exposure guidelines. Groundwater contamination is also possible in the event of spills or leaks from production, transportation, transfer, or storage equipment.\(^3\) For further details, see Exposure Potential.
- Exposure to vapors can cause moderate eye irritation with moderate corneal injury. Prolonged skin contact can cause irritation with local redness. Repeated skin contact may cause burns. Excessive inhalation exposure may cause irritation to the upper respiratory tract (nose and throat) and lungs and affect the central nervous system. Oral ingestion can cause gastrointestinal irritation or ulceration and, if swallowed in large amounts, may affect the central nervous system or cause other injury, even death. If aspirated into the lungs, this product may cause lung damage or even death by chemical pneumonia. Exposure to the product may result in irreversible damage to hearing. Exposure to the individual components of this product can have serious health consequences.\(^4\) For further details, see Health Information.
- The components of toluene/xylene mix are readily biodegradable, are not persistent in the environment, and will not accumulate in the food chain. The product will be removed by

---

\(^1\) Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow

Revised: October 27, 2012  The Dow Chemical Company  Page 1 of 7
biological wastewater-treatment facilities. This product is toxic to aquatic organisms. For further details, see Environmental Information.

- Toluene/xylene mix is extremely flammable. It is stable under normal storage and handling conditions, but can decompose at elevated temperatures. Generation of gas during decomposition can cause rapid pressure build-up in closed systems. Avoid contact with strong acids, strong bases, and strong oxidizers. For further details, see Physical Hazard Information.

Back to top

**Manufacture of Product**

- **Production** – The Dow Chemical Company and an affiliated company produce this product in Plaquemine, Louisiana, USA and Terneuzen, The Netherlands, respectively.
- **Process** – Toluene/xylene mix originates from high-temperature cracking of petroleum fractions. It is separated by distillation during the recovery of benzene from pyrolysis gasoline. The diagram below illustrates the source and primary use of this product in hydrodealkylation (HDA) to produce benzene.

![Diagram illustrating the manufacture of toluene/xylene mix](image)

Back to top

**Product Description**

Toluene/xylene mix is a liquid that ranges from clear to yellow in color, with a moderate to strong aromatic or camphor-like odor. It does not mix with water. The product is low in sulfur, but the composition may vary depending on the cracker feedstock and conditions. The major components of this mixture are toluene, ethylbenzene, xylene, benzene, and styrene. For detailed composition information, see the Safety Data Sheet.

Back to top

**Product Uses**

Toluene/xylene mix is used as a chemical intermediate for the production of benzene and other aromatic industrial chemicals. This product may also be used for blending into gasoline sold as motor fuel. Toluene/xylene mix should not be sold to consumers and not be used in pesticide applications, preparations, or formulations in which a concentration equal to or higher than 0.1% of toluene is present in the final products (adhesives, spray paints, etc.) intended for sale to the general public.
Exposure Potential

Based on the uses for toluene/xylene mix, the public could be exposed through:

- **Workplace exposure** – For industrial workers at hydrocarbon-processing facilities, the most likely exposure route is inhalation of low-level concentrations of vapors that escape from the closed process, such as fugitive emissions from valve packings and pump seals. Other potentials for exposure may result during operations such as sampling and loading of bulk transportation vessels (tank cars, tanks trucks, and barges), from emissions at floating-roof storage tanks or control devices, such as flares, or during infrequent equipment maintenance. Adequate ventilation should be used to maintain vapor levels below recommended guidelines. Workers should wear safety glasses and protective gloves and clothing to prevent exposure when prolonged or frequently repeated contact could occur. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit exposure. There are established threshold limit values and permissible exposure limits for many of the components in these gasoline blends. These occupational exposure limits are used in the workplace to limit exposure to the components of this material. See [Health Information](#).

- **Consumer exposure to toluene/xylene mix** – This product is only sold for industrial use and not for consumer use. The product is produced, transported, and processed within industrial facilities in which there is no expected consumer exposure. A limited amount of toluene/xylene mix may be blended into gasoline. Consumers may come into contact with the product when they fuel vehicles. Consumers should avoid inhaling gasoline vapors to minimize the risk of exposure to benzene and other components that are likely to be present in gasoline. For exposure guidelines, see [Health Information](#).

- **Environmental releases** – Environmental exposure to toluene/xylene mix is limited since the product is produced, processed, and stored in industrial facilities in which the product is contained in closed systems, pipes, and storage vessels. Transport is by pipeline, barge, railroad tank car, or tank truck so that the material is typically contained within the transport container, except for accidental spills or leaks. If released accidentally, the major components of toluene/xylene mix are readily biodegradable with low tendency to accumulate in the food chain. They are not persistent and would be removed by biological wastewater-treatment facilities. Although toluene/xylene mix is considered toxic to aquatic organisms, it does not mix with water and will tend to float on the surface. Once toluene/xylene mix is blended into a gasoline product, releases into the environment are limited to accidental spills and leaks of the gasoline product. See [Environmental, Health, and Physical Hazard Information](#).

- **Large release** – Industrial spills or releases are infrequent and generally contained. A large spill or release can be hazardous due to the physical properties, effects to the environment, or health hazards associated with this product or its components. If a large release occurs, contact local and/or state or provincial authorities. Toluene/xylene mix, and gasoline blended with these products, are flammable liquids. In the event of a leak or spill, appropriate actions should be taken to avoid fire, contamination of the environment, or exposure to the pure material or gasoline blends. 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. Use of a direct water stream may spread the fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. The public should be warned of downwind vapor explosion hazards. Vapors are heavier than air and may travel a long distance and accumulate in low-lying areas. Keep vapors out of sewers. Immediately withdraw all personnel from the area in case of rising sounds from venting safety devices or discolorations of the container. 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, see the relevant [Safety Data Sheet](#).
Health Information

**Eye contact** – Contact may cause moderate irritation with moderate corneal injury. Vapor may cause eye irritation experienced as mild discomfort, tearing, and redness.

**Skin contact** – Prolonged contact may cause skin irritation with local redness. Repeated contact may cause skin burns with symptoms of pain, severe local redness, swelling, and tissue damage. Prolonged skin contact is unlikely to result in absorption of harmful amounts.

**Ingestion** – The single dose oral toxicity of toluene/xylene mix is moderate. Swallowing may result in gastrointestinal irritation or ulceration. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing large amounts may affect the central nervous system or cause other injury, even death. If aspirated into the lungs, this product may cause lung damage or even death by chemical pneumonia.

**Inhalation** – Vapor concentrations are attainable that could be hazardous on single exposure. Excessive exposure may cause irritation to the upper respiratory tract (nose and throat) and lungs and may also affect the central nervous system, resulting in narcotic or anesthetic effects, including dizziness and drowsiness. Excessive exposure may also increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeat).

**Health Considerations for Components** – Toluene/xylene mix contains several components that have demonstrated toxic effects, including ototoxicity (irreversible damage to the outer hair cells in the cochlea in the ear), cancer in laboratory animals, and red blood cell hemolysis (impairment of the ability of the blood to transport oxygen). Other health hazards associated with components of these products include:

- **Toluene**: Has been toxic to the fetus in laboratory animals at doses toxic to the mother. It has caused birth defects in mice when administered orally, but not by inhalation. Toluene is classified as a reproductive toxicant (category 3) by the Commission of European Communities (EC) for effects upon fetal development. It may also cause hearing impairment.
- **Ethylbenzene**: Has caused birth defects in laboratory animals and been shown to cause cancer in laboratory animals. It is listed as a Group 2B carcinogen by the Agency for Research on Cancer (IARC). It may also cause hearing impairment.
- **Xylene**: Has caused toxicity to the fetus in animal inhalation studies, but did not cause birth defects. Xylene is reported to have caused hearing loss or hearing impairment at certain frequencies in laboratory animals upon exposure to high concentrations, but this has not been reported in humans. Extreme doses of xylene given orally to pregnant mice resulted in an increase in cleft palate, a common abnormality in mice. Inhalation exposure of pregnant animals to xylene resulted in toxicity to the fetus, but did not cause birth defects.
- **Benzene**: In animal studies, has been shown to interfere with fertility in males. In vitro mutagenicity studies were positive. Animal mutagenicity studies were positive. This substance is classified as a category 1 carcinogen by the Commission of European Communities (EC). Benzene is classified by the International Agency for Research on Cancer (IARC) as Group 1: Carcinogenic to humans. Benzene is also classified as a known carcinogen by National Toxicology Program (NTP).
- **Styrene**: Has been shown to be toxic to the fetus at concentrations having an adverse effect on the mother. Birth defects are unlikely. Life-time inhalation exposure of mice to styrene produced an increased incidence of lung tumors in treated animals. Studies investigating the relevance of the mouse tumors for human health suggest this has little or no relevance for human health. Styrene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations. However, the relevance to humans is unknown. Some studies in humans report that repeated exposure to styrene may result in minor decreases in the ability to discriminate between colors.

For more information, see the relevant Safety Data Sheet.
Environmental Information

The major components of toluene/xylene mix are readily biodegradable, and the bioaccumulation potential (tendency to accumulate in the food chain) of each component is low. They are not persistent and would be removed by biological wastewater-treatment facilities.

Toluene/xylene mix does not mix with water and will tend to float on the surface. Prevent spilled product from entering soil, ditches, sewers, waterways, and/or groundwater. All components are considered toxic to aquatic organisms.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

Toluene/xylene mix is extremely flammable. Minimize sources of ignition, such as static build-up, heat, spark, or flame. Store product in steel containers, preferably located outdoors, away from direct sunlight, above ground, and surrounded by dikes to contain spills or leaks. Keep containers tightly closed in a cool, well-ventilated place. Hold bulk storage under nitrogen blanket. Damaged or punctured drums should be emptied and disposed of properly in accordance with regulatory guidelines.

These products are stable under normal storage and handling conditions, but can decompose at elevated temperatures. Generation of gas during decomposition can cause rapid pressure build-up in closed systems. Decomposition products depend upon temperature, air supply, and the presence of other materials. Avoid contact with strong acids, strong bases, and strong oxidizers.

Vapors are heavier than air and may travel a long distance and accumulate in low-lying areas. Ignition and/or flash back may occur. Containers, even those that have been emptied, can contain flammable vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers.

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 toluene/xylene mix. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet or Contact Us.

Additional Information

- Safety Data Sheet (www.dow.com/webapps/msds/ShowPDF.aspx?id=090003e88010be3d)
- European Gasoline Blend Components, Product Data Sheet, The Dow Chemical Company, Form No. 778-00801, July 2011 (www.dow.com/hydrocarbons/aromatics/prod/gasoline_tn100.htm)

For more information about this toluene/xylene mix, see the Dow Aromatics Products web site at http://www.dow.com/hydrocarbons/aromatics/prod/.
References


Back to top
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.

The information herein is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Dow be responsible for damages of any nature whatsoever resulting from the use of or reliance upon the information herein or the product to which that information refers.

Nothing contained herein is to be construed as a recommendation to use any product, process, equipment or formulation in conflict with any patent, and Dow makes no representation or warranty, express or implied, that the use thereof will not infringe any patent.

NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

Dow makes no commitment to update or correct any information that appears on the Internet or on its World-Wide Web server. The information contained in this document is supplemental to the Internet Disclaimer, http://www.dow.com/homepage/disclosure.html

Back to top

Form No. 233-00945-MM-1012