

## TOLUENE/XYLENE MIXTURE

### Product Summary

Toluene/Xylene Mixture is a co-product of the ethylene manufacturing process at NOVA Chemicals' Corunna, Ontario facility. Toluene/Xylene is an aromatic hydrocarbon, used in gasoline blends or as a feedstock for industrial chemicals and solvents. This mixture is predominantly C6-C8 aromatics. Toluene/Xylene production occurs in closed systems and the co-product is transported in bulk by pipeline, rail and marine to other industrial sites in Canada and in the United States for additional processing. Toluene/Xylene Mixture is stored in bulk storage tanks equipped with floating roofs to reduce emissions.

Toluene/Xylene Mixture is not expected to be acutely toxic by the oral, dermal or inhalation routes of exposure. However, ingestion or subsequent vomiting may present an aspiration hazard. Prolonged and repeated exposure to the product at high concentrations may cause serious health effects, including adverse effects in several organ systems and developmental toxicity.

NOVA Chemicals has obtained a registration under Health Canada's Precursor Control Regulations for its activities involving toluene.

### Product Use Information

NOVA Chemicals' Toluene/Xylene co-product is used only in industrial applications. Toluene, the largest aromatic component in this mixture is used in refinery streams such as gasoline blending for its octane value. Xylenes may either be used in refinery streams for gasoline blending or further separated by isomers for chemical applications. There are no known consumer uses for NOVA Chemicals' Toluene/Xylene Mixture.

### Human Exposure

Exposure to Toluene/Xylene Mixture in occupational and non-occupational settings is very limited. Exposure of workers may occur through inhalation and dermal contact at the workplace where toluene/xylene mixture is produced or used. Any potential occupational exposure by inhalation of low level concentrations of toluene/xylene is restricted to storage, handling, sampling operations, fugitive emissions from process equipment (such as pumps or valves); or dermally by accidental releases. The maximum occupational exposure limit (OEL) to toluene is 20 or 50 parts per million (ppm) (it is province-dependent in Canada) and 200 ppm in the United States (as per the Occupational Safety and Health Administration (OSHA)); the maximum occupational exposure limit to xylenes is 100 ppm in Canada and in the United States; the maximum occupational exposure limit to ethylbenzene is 20 or 100 ppm (it is province-dependent in Canada) and 100 ppm in the United States (as per OSHA); these OELs are averaged over 8-hours of work or a 40-hour work week. Workplace air quality measurements taken by NOVA Chemicals in typical industrial operations indicate that good equipment design, maintenance and good operating practices and procedures minimize exposure to levels well below permissible workplace exposure limits. The American Conference of Governmental Industrial Hygienists (ACGIH) has also established workplace biological exposure indices (BEI) for toluene, xylene and ethylbenzene.

General population exposure to Toluene/Xylene Mixture from industrial facilities is limited because industrial air emissions are subject to federal and state/provincial environmental regulations for volatile organic compounds.

### Health Information

Toluene/Xylene Mixture is not acutely toxic by the oral, dermal or inhalation routes of exposure. Breathing of vapours at concentrations above the recommended exposure standards of the components can cause central nervous system effects (e.g. drowsiness, lightheadedness, etc.). In the case of ingestion and subsequent aspiration into the lung some of the components may cause chemical pneumonitis. Prolonged and repeated exposure to Toluene/Xylene Mixture at high concentrations may cause serious health effects, including neurological impairments and developmental toxicity. Evaluation of scientific and health information suggests that competitive metabolic interactions did not occur among Toluene, Xylene and Ethylbenzene. Animal data further indicate that repeated exposure to higher levels of Toluene, Xylene and Ethylbenzene can damage liver and kidney tissues due to formation of reactive metabolites. Benzene, which is always less than 1% of this product and usually less than 0.1%, is a confirmed human carcinogen (leukemia). Ethylbenzene, which is less than 25% of this product has been classified by the International Agency for Research on Cancer (IARC) as Group 2B (possibly carcinogenic to humans). Xylene, which is less than 10% of this product, is considered to be a developmental toxicant (birth defects) in Canada.

### Environmental Exposure

Environmental exposure to Toluene/Xylene Mixture can occur through accidental spills, fugitive emissions, leakage or release of vapours into the atmosphere during tankage, delivery, or transfer for storage. Emissions from storage and loading equipment is typically controlled by using floating roof storage tanks or by routing vents from fixed roof storage tanks and loading equipment to control or recovery systems. Industrial volatile organic compound emissions and spills are regulated in Canada and in the United States and must be reported to regulatory agencies.

**TOLUENE/XYLENE MIXTURE****Ecological Information**

Toluene/Xylene Mixture is moderately toxic to aquatic organisms but is not expected to bioconcentrate. If Toluene/Xylene Mixture is accidentally released into the environment it evaporates to air, where it will rapidly degrade. The components of the mixture that do not evaporate quickly are expected to be highly mobile in soil and may reach groundwater. Degradation of some components in soil and groundwater is expected to occur within a period of days. This product is likely to biodegrade significantly.

**Physical Hazards**

Toluene/Xylene Mixture is a volatile, flammable, colourless liquid that is insoluble in water. This product has a strong solvent odour and can be detected in the range of 2 to 5 ppm. Toluene/Xylene Mixture poses a serious fire and explosive hazard when exposed to heat or flame. Vapour is heavier than air and may collect in low areas. The vapours can travel for some distance; if it comes into contact with ignition sources, the flame may then be propagated along the vapour trail back to the source and cause an explosion. Industrially produced Toluene/Xylene Mixture is kept within closed systems during production, storage, transportation and use to help minimize these risks.

**Risk Management at NOVA Chemicals**

Risk management priorities focus efforts and improvements in process design, operation and maintenance of our industrial facilities and transportation pipelines to prevent accidental releases and minimize the potential for fires or explosion. Use of suitable packing materials and sealing technology minimizes releases from pump seals, valve packings, pipe connections or gaskets. Ongoing preventive Leak Detection and Repair (LDAR) programs are in place at the Corunna, Ontario production and storage facility. Emergency response teams are prepared and equipped to respond to on-site and off-site incidents. Processes are designed to eliminate possible ignition sources and undergo periodic detailed Process Hazard and Risk Assessment Reviews (HAZOPs).

All processing, storage, and transport are conducted in closed systems designed to minimize the potential for exposure or releases to the environment. Industrial hygiene programs periodically review all workplace potential exposures to ensure controls are in place and effective. Personal protective equipment is used to prevent exposure in those situations where exposure cannot be controlled using engineering controls or other methods.

NOVA Chemicals continues to carefully review all relevant information on the safety and suitability of Toluene/Xylene mixture and other petrochemical products for their known and intended end uses. In addition, NOVA Chemicals is committed to sharing information on the safe handling and end use of our products with customers and other interested parties. Safety Data Sheets (SDS) are provided to our customers and can be accessed by interested members of the public electronically at the NOVA Chemicals' website at [www.novachemicals.com](http://www.novachemicals.com).

NOVA Chemicals is a member of the American Chemistry Council (ACC) and the Chemistry Industry Association of Canada (CIAC). Through these and other industry associations, we actively monitor and participate in public regulatory processes impacting this product. We also seek to better understand health and environmental challenges related to all of our products. We actively support industry sponsored product testing initiatives and other industry initiatives supporting responsible actions, sound science and life cycle stewardship of our products.

*Updated: February 24, 2016*

*For detailed information on this product, please review the product Safety Data Sheet (SDS). In the case of an emergency involving this product, please call our 24-hour hotline at 1-800-561-6682 or 1-403-314-8767.*

*For more information on this product risk profile, please contact us at 1-412-490-4063 or email us at [stewardp@novachem.com](mailto:stewardp@novachem.com).*

*For more information on any NOVA Chemicals' product, please contact us at the nearest location below during business hours or visit our website at [www.novachemicals.com](http://www.novachemicals.com).*

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