

MATERIAL SAFETY DATA SHEET

Propylene Trimer (Nonene)

ISSUE DATE: August 2, 2006

Emergency Phone Number: (713) 475-7771

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CHEMTREC: (800) 424-9300

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Propylene Trimer (Nonene)**

Chemical Name: C8-C11, C9-Rich, Alkenes

Manufacturer: Texas Petrochemicals LP
 8600 Park Place Boulevard
 Houston, Texas 77017

Synonyms: Nonenes; Tripropylene; C9 Alkenes Concentrate; Dimethylheptenes Concentrate; Nonylenes; or C8-C10 Olefinic Naphtha.

2. COMPOSITION/INFORMATION ON INGREDIENTS

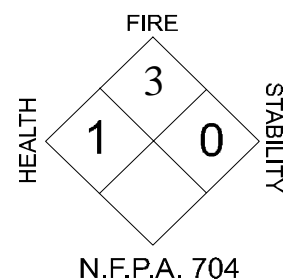
<u>Components</u>	<u>CAS Registration Number</u>	<u>Weight %</u>
1-Octene	111-66-0	0.5 to 1.5
2,6-Dimethylheptene-1	3074-78-0	45 to 49
2,6-Dimethylheptene-3	2738-18-3	45 to 49
Other C9 Alkenes	27215-95-8	0.5 to 2
2,4,6-Trimethylheptene-1	102943-77-1	0.5 to 4
C11-Rich Alkenes	20115-76-6	0.5 to 2

Compositions given are typical values, not specifications.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:

- Clear, colorless liquid with a distinctive hydrocarbon solvent odor.
- **DANGER!** Highly flammable liquid and vapor; vapor accumulation may cause flash fire or explosion.
- May form explosive peroxides when heated.
- Liquid can accumulate a static charge which may cause an incendiary electrical discharge under cool or cold and dry conditions.
- Harmful or fatal if swallowed; may be aspirated and cause lung damage.
- May be harmful if inhaled; mists or vapors may cause nausea and irritation of the eyes, nose (mucous membranes), and respiratory tract.
- High concentrations of vapor reduce oxygen available for breathing and overexposures may cause central nervous system (CNS) depression and target organ effects.
- Liquid contact may cause minimal to mild eye irritation and/or mild to moderate skin irritation.
- Toxic to aquatic organisms.
- Spills may create a fire and slipping hazards.



HMIS Ratings: Health = 2; Flammability = 3; Physical Hazard = 0.

Inhalation:

Breathing high concentrations of vapor may cause respiratory irritation, euphoria, excitation or giddiness, headache, nausea, vomiting, abdominal pain, loss of appetite, fatigue, muscular weakness, staggering gait, and central nervous system (CNS) depression. CNS effects include drowsiness, dizziness, disorientation, vertigo, memory loss, visual disturbances, breathing difficulty, convulsions, unconsciousness, paralysis, coma, and death, depending upon the exposure duration. Vapors can reduce the oxygen content in air. Although unlikely, oxygen deprivation is possible if one is working in confined spaces. Approximately 20,000 ppm (2 vol.%) in air is fatal to humans in 5 to 10 minutes.

Eye Contact:

Minimal to mild reversible eye irritation is expected upon short-term exposure. This is based upon animal test results for similar materials and major components.

Skin Contact:

Tests on similar products suggest that short-term liquid skin contact may cause mild to moderate irritation and inflammation.

Ingestion:

May cause nausea, vomiting, and irritation to the mucous membranes of the mouth, throat, and esophagus. Due to its light viscosity, there is a danger of aspiration into the lungs during vomiting. Aspiration of small amounts of this liquid can result in severe lung damage or death via chemical bronchopneumonia or pulmonary edema. Cardiovascular effects include shallow rapid pulse and pallor followed by flushing. Progressive CNS depression, respiratory insufficiency, and ventricular fibrillation may result in death.

Chronic Effects:

Prolonged and/or repeated contact may cause moderate to severe skin irritation and inflammation. Symptoms include de-fatting, redness, dryness, and blistering. CNS and respiratory tract effects can result from prolonged exposure.

Conditions Aggravated by Exposure:

Personnel with pre-existing central nervous system (CNS) disease, psychological conditions, chronic respiratory diseases, skin disorders, or impaired cardiovascular function should avoid exposure.

Carcinogenic Potential:

This product does not contain any components with concentrations above 0.1% which are considered carcinogenic by ACGIH, OSHA, IARC, or NTP.

4. FIRST AID MEASURES

Inhalation:

If inhaled, immediately remove victim from exposure to fresh air. If not breathing, immediately begin artificial respiration (CPR). If breathing is difficult, 100% humidified oxygen should be administered by a qualified individual. Get medical attention immediately.

Eye Contact:

Check for and remove contact lenses. Immediately flush eyes with plenty of cool, clean, low-pressure water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Hold eyelids apart to ensure complete tissue irrigation. Do not use eye ointment! Get medical attention immediately.

Skin Contact:

Immediately flush affected area with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If skin surface is damaged, apply a clean dressing and seek medical attention. Do not use ointments! If skin surface is not damaged, thoroughly cleanse the entire contaminated area with mild soap and water. Wash clothing before reuse.

Ingestion:

DO NOT INDUCE VOMITING or give anything by mouth! If spontaneous vomiting is about to occur, place victim's head below the knees. If victim is drowsy or unconscious, place on their left side with head down. Never give anything by mouth to a person who is not fully conscious. Do not leave the victim unattended. Obtain medical attention immediately.

Notes to Physician:

Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for upper respiratory tract inflammation, bronchitis, and pneumonitis. Vigorous anti-inflammatory/steroid treatment may be required at first evidence of upper airway or pulmonary edema. Administer 100% humidified supplemental oxygen with assisted ventilation, as required.

If ingested, this material presents a significant aspiration/chemical pneumonitis hazard. As a result, induction of emesis is not recommended. Administer an aqueous slurry of activated charcoal followed by a cathartic such as magnesium citrate or sorbitol. Also, treatment may involve careful gastric lavage if performed soon after ingestion or in patients that are comatose or at risk of convulsing. Protect the airway by cuffed endotracheal intubation or by placement of the body in a left lateral decubitus position. Obtain chest X-ray and liver function tests. Monitor for cardiac function, respiratory distress, and arterial blood gases in severe exposure cases.

5. FIRE FIGHTING MEASURES

<u>Flash Point:</u>			<u>Flammability Limits</u> (Volume Percent in Air)
Tagliabue CC (ASTM D-56)	21° - 23°C.	70° - 73°F.	Lower: Approx. 0.7 (1-Octene) Upper: Approx. 6.4 (1-Nonene)
Auto-Ignition Temperature	230° - 260°C.	446° - 500°F.	

Fire Hazards:

This mixture is an OSHA/NFPA Class IB or IC Highly Flammable Liquid. This material releases vapors at or below ambient temperatures. When mixed with air in certain proportions and exposed to an ignition source, its vapor can cause a flash fire. Use only with adequate ventilation. Vapors are heavier than air and may travel long distances along the ground to an ignition source and flash back. Also, this mixture floats on water and is insoluble in water. A vapor and air mixture can create an explosion hazard in low or confined spaces such as sewers. If closed containers are not properly cooled, they can rupture and explode in the heat of a fire.

Extinguishing Media:

For small fires, use dry chemicals, carbon dioxide, water fog, foam, or alcohol-resistant foam. Use the most appropriate agent for the particular fire. For large fires, use water spray, water fog, foam or alcohol-resistant foam. Water fog and spray are effective in cooling fire-exposed containers and adjacent structures but might not achieve extinguishment. A water jet may be used to cool a vessel's external walls to prevent pressure build-up, auto-ignition, or explosion; however, NEVER use a water jet directly on the fire because it may spread the fire to a larger area. DO NOT use water spray or jets when the runoff cannot be contained.

Fire Fighting Protective Procedures:

During a fire, irritating and highly toxic gases may be generated by combustion or thermal decomposition. As with any fire, firefighting personnel must wear full protective gear including a MSHA/NIOSH (approved or equivalent) self-contained breathing apparatus (SCBA) in pressure-demand mode. Evacuate the area and fight the fire from a maximum distance or use unmanned hose holders or monitor nozzles. Cover pooling liquid with foam. Containers can build pressure if exposed to radiant heat; cool adjacent structures with flooding quantities of water until well after the fire is put out. Withdraw immediately from the area if there is a rising sound from venting safety devices or discoloration of vessels, tanks, or pipelines. Be aware that burning liquid will float on water and a fire may be spread by its use. Contaminated water run-off can cause environmental damage. Dike and collect water used to fight the fire. Notify appropriate authorities if liquid(s) enter sewers or waterways.

6. ACCIDENTAL RELEASE MEASURES

General Information:

Take proper precautions to ensure your own health and safety before attempting spill control or clean-up. For more specific information, refer to the Emergency Overview on Page 1, Exposure Controls and Personal Protection in Section 8, and Disposal Considerations in Section 13 of this MSDS.

Small Spill:

Highly Flammable Liquid! A spill or leak can cause an immediate fire/explosion hazard. Evacuate all non-essential personnel from immediate area and establish a "regulated zone" with site control and security. Vapor-suppressing foam may be used to reduce vapors. Eliminate all ignition sources. Always approach from upwind/uphill. Do not touch or walk through spilled material. Stop the leak if it can be done without risk. Remove spillage immediately from hard, smooth walking areas. Prevent its entry into waterways, sewers, basements, or confined areas. Absorb spilled material with vermiculite, absorbent pads, etc. or cover with dry earth, sand, or other non-combustible material. Use clean, non-sparking tools to collect absorbed material. Transfer to appropriate waste containers for later disposal.

Large Spill:

If tanks or tank cars are involved, immediately evacuate all non-essential personnel to at least the distance recommended in the current version of the Emergency Response Guidebook. Secure the area and control access. Dike far ahead of a liquid spill to ensure complete collection. Apply a blanket of vapor suppressing foam or aqueous film-forming foam to the spill surface to minimize fire potential. Water mist or spray may be used to help dissipate vapors; however, it may not prevent ignition in closed spaces. This material will float on water and its run-off may create an explosion or fire hazard. Keep run-off from entering sewers and/or ditches that lead to waterways.

Verify that responders are properly HAZWOPER-trained and wearing appropriate respiratory equipment and fire-resistant protective clothing during cleanup operations. In an urban area, cleanup spill as soon as possible; in natural environments, cleanup on advice from specialists. Pick up free liquid for recycle and/or disposal if it can be accomplished safely with explosion-proof equipment. Use proper grounding and bonding techniques when transferring the spilled liquid to prevent ignition from static charges. Collect any excess material with absorbent pads, sand, or other inert non-combustible absorbent materials. Place into appropriate waste containers for later disposal. Comply with all laws and regulations and consult the appropriate regulatory agencies for reporting and disposal requirements.

7. HANDLING AND STORAGE

Handling:

Prior to product use, keep containers tightly closed. Use only with adequate ventilation and personal protection. See Section 8 for personal protective equipment recommendations. Never siphon by mouth or take internally. Avoid inhalation of vapors or mist and liquid contact with eyes, skin, and clothing. Prevent contact with food, chewing, or smoking materials. Wash thoroughly after handling and wash clothing before reuse. Properly bond and/or ground hoses and equipment used in transferring this product to prevent ignition from static electrical charge (See NFPA 77). Only use spark proof tools and explosion resistant equipment. Avoid contact with oxidizers and all potential ignition sources.

When performing repairs and maintenance on contaminated equipment, keep unnecessary persons away from the area. Eliminate all potential ignition sources. Drain and purge equipment, as necessary, to remove material residues. Use gloves constructed of impervious materials and protective clothing if direct contact is anticipated. Provide ventilation to maintain exposure potential below applicable exposure limits. Promptly remove contaminated clothing. Wash exposed skin thoroughly with soap and water after handling.

Treat empty containers with full precautions. Empty containers may contain liquid and/or vapor residues which can ignite with explosive force. Keep containers closed and drum bungs in place. All label warnings and precautions must be observed. Misuse of empty containers can be dangerous if used to store other toxic, flammable, or reactive materials. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Take precautionary measures against static discharges. Return empty drums to a qualified reconditioner. Consult appropriate federal, state, and local authorities before reusing, reconditioning, reclaiming, recycling, or disposing of empty containers and/or waste residues of this material.

Storage:

Store and transport this liquid in accordance with all applicable laws. Keep containers segregated, bonded, and away from all ignition sources! Keep containers tightly closed and store them in a cool, dry, well-ventilated place, plainly labeled, and out of closed vehicles. Containers should be able to withstand pressures expected from warming and cooling during storage. Storage tanks should be of the floating roof type or stored with an inert head space if tank does not have a floating roof. Maintain inhibitor levels at least 200 ppm concentration to avert peroxide formation. All electrical equipment in areas where this product is stored or handled should be installed in accordance with applicable requirements of the NFPA's National Electrical Code (NEC). Consult NFPA 30 for additional information.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

Occupational Exposure Guidelines:

The following occupational exposure standards are suggested guidelines for this product's use, but are not directly applicable to its specific components.

Substance:

- 1) Octane, all isomers
- 2) Nonane, all isomers

Applicable Workplace Exposure Limits:

- TWA: 300 ppm from ACGIH (TLV) [2005]
TWA: 500 ppm from OSHA (PEL) [1976]
TWA: 200 ppm from ACGIH (TLV) [2005]
TWA: 200 ppm from OSHA (PEL) [1989]

Engineering and Exposure Control:

Process enclosures, closed systems, and local exhaust ventilation should be used to control exposures. Never use this product in closed or confined spaces without ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and/or mists below pertinent exposure limits. Ventilation systems should have explosion proof equipment. All electrical equipment should comply with the NFPA NEC Standards. Ensure that emergency eye wash stations and safety showers are near each workstation location.

Personal Protection:

Personal protective equipment should be selected based upon the conditions under which this material is used. A hazard assessment of the work area for PPE requirements should be conducted by a qualified professional pursuant to OSHA regulations.

Eye Protection:

Safety glasses with side shields are recommended as a minimum protection. In addition to safety glasses, full face-shields, and/or chemical splash goggles should be worn depending on the task. Comply with OSHA's eye and face protection regulations in 29 CFR 1910.133 or the European Standard EN 166. Suitable eye wash water should be readily available at each workstation.

Skin Protection:

Gloves, aprons, and chemical resistant garments should be selected with regard to the task to be performed and the hazard potential for skin contact. In general, garments and gloves made from PVC, nitrile, neoprene, or rubber with substantial thickness should be suitable for incidental splash protection. End users are strongly urged to consult glove/garment manufactures for specific guidance. Contaminated clothing should be removed and laundered at an appropriate industrial laundry facility.

Respiratory Protection:

Air purifying respirators with organic vapor cartridges may be used if air-borne concentrations of the mixture's components are known. Refer to NIOSH's *Respirator Decision Logic* or the respirator manufacturer for specific guidance on the specific type of respirator to use. For fires, spills, or situations where the airborne concentration of the chemical is unknown, use a NIOSH approved, positive pressure mode, self-contained breathing apparatus (SCBA). Whenever workplace conditions warrant a respirator's use, comply with respiratory protection requirements that meet OSHA 29 CFR 1910.134, ANSI Z88.2, or European Standard EN 149.

9. PHYSICAL AND CHEMICAL PROPERTIES

<u>Physical Form:</u>	Clear liquid; invisible vapor.	<u>Odor:</u>	Petroleum solvent smell.
<u>Boiling Point Range:</u>	253° to 345°F. (123° to 173°C.)	<u>Melting Point Range:</u>	-152° to -76°F. (-101° to -76°C.)
<u>pH:</u>	Not applicable.	<u>Solubility in Water:</u>	Negligible in cold water.
<u>Specific Gravity:</u>	0.73 to 0.75 (H ₂ O = 1)	<u>A.P.I. Degrees:</u>	57 to 63
<u>Density:</u>	6 lbs./gallon at 60°F. (15.6°C.)	<u>Reid Vapor Pressure:</u>	1.97 (Air = 1) (D-5191)
<u>Vapor Pressure:</u>	5 to 11 mm Hg at 68°F. (20°C.); 0.05 to 0.09 psia at 68°F. (20°C.)	<u>Vapor Density:</u>	3.9 to 4.35 (Air = 1)
<u>Viscosity:</u>	0.75 to 0.85 mm ² /sec. at 20°C.	<u>Average Molecular Weight:</u>	126 to 127
<u>Evaporation Rate:</u>	1.6X faster than Butyl acetate.	<u>% Volatile by Weight:</u>	100; approx. 780 gm/L.

10. STABILITY AND REACTIVITY

Chemical Stability:

This material is stable under normal temperatures and pressures. Inhibitor may be added during storage to reduce the formation of explosive peroxide compounds, especially when exposed to excessive heat.

Hazardous Polymerization:

Not expected to occur unless exposed to excessive heat or other radiation.

Conditions to Avoid:

Ignition sources, excessive heat, build up of static electricity, and air.

Incompatible Materials:

Strong oxidizing agents such as oxygen or peroxides, inorganic acids, halogens and halogenated compounds, and molten sulfur. If uninhibited, this olefinic naphtha may cause oxidation of copper and alloys containing copper. It will also attack rubber, paints, and lining materials.

Hazardous Decomposition Products:

Incomplete burning produces carbon monoxide, carbon dioxide, irritating and toxic fumes/gases, and unburned hydrocarbons. If uninhibited, explosive peroxide compounds or gums may form.

11. TOXICOLOGICAL INFORMATION

This product has not been tested as a whole. However, major components (1-Octene, mixed C8-C10, C9-Rich, Alkenes, and mixed C9-C11, C10-Rich, Alkenes) are currently being assessed under EPA's High Production Volume (HPV) toxicology testing program in the Higher Olefins Category. The following information concerns similar products and several of the components of this mixture.

Octenes (Mixed Isomers) [CAS# 25377-83-7]:

<u>LD50 (Oral-rat):</u>	over 3,500 mg/kg.
<u>LD50 (Skin-rabbit):</u>	over 2,000 mg/kg.
<u>LC50 (Inhalation-rat):</u>	36.87 mg/L. (4 hours exposure)

1-Octene [CAS# 111-66-0]:

LD50 (Oral-rat): over 5,000 mg/kg.

LD50 (Skin-rat): over 2,000 mg/kg.

LD50 (Skin-rabbit): over 1,430 mg/kg.

LC50 (Inhalation-rat): 8,050 ppm and 36.9 mg/L. (4 hours exposure)

Eye and Skin Irritation: Not expected to be irritating to the eyes; mildly to moderately irritating to skin upon short-term contact and moderately to severely irritating upon prolonged or repeated contact.

Sensitization (Skin-Guinea pig): Not a sensitizer.

Repeated Oral Dose Toxicity: 1-Octene was tested in a rat forced-feeding study that lasted 13-weeks with doses of 0, 5, 50, and 500 mg/kg/day and administered 7 days/week. In this sub-chronic study, the lowest affects exposure level (LoAEL) was determined to be 500 mg/kg. These effects included increased rat kidney weights and decreased plasma chloride concentrations in both sexes.

Genetic Toxicity: The Ames test showed negative results and the Chromosome Aberration Assay produced equivocal results with metabolic activation and negative results without metabolic activation.

Alkenes, C8-C10, C9-Rich [CAS# 68526-55-6] (as manufactured by Imperial Oil & Chemicals Company): LD50 (Oral-rat): over 2,000 mg/kg.

LD50 (Skin-rat): over 2,000 mg/kg.

LC50 (Inhalation-rat): over 5,000 ppm (4 hours exposure)

Eye and Skin Irritation: Mildly irritating to the eyes and skin upon short-term contact and moderately to severely irritating to skin upon prolonged contact.

Nonenes (Mixed Isomers) [CAS# 27215-95-8] or [CAS# 97593-01-6]:

LD50 (Oral-rat): over 2,350 mg/kg. and 2,100 mg/kg. – Gastrointestinal hypermotility, diarrhea, peritonitis, and weight loss or decreased weight gain.

LD50 (Skin-rabbit): 5,000 mg/kg.

Eye and Skin Irritation: Slightly irritating to the eyes and skin upon short-term contact.

LC50 (Inhalation-rat & mouse): 11.1 mg/L. (6 hours exposure) – No animals died. Signs of toxicity included ataxia, labored breathing, salivation, tremors, and soft stools.

LC50 (Inhalation-rat): 18.5 mg/L. (6 hours exposure) – Six out of ten rats died with symptoms of nasal discharge, tremors, and convulsions.

Nonenes (Mixed Isomers) [CAS# 27215-95-8] or [CAS# 97593-01-6]:

LC50 (Inhalation-mouse): 18.5 mg/L. (6 hours exposure) – Two out of ten mice died.

LC50 (Inhalation-Guinea pig): 18.5 mg/L. (6 hours exposure) – Five out of ten pigs died.

Genotoxicity of mixed nonenes was also studied by the reverse mutation assay in bacteria and the B6C3F1 mouse micronucleus assay. Mixed nonenes were NOT mutagenic in Salmonella typhimurium TA98, TA100, TA1535, TA1537, and 1538 test systems with and without metabolic activation. They did NOT induce a statistically significant increase in the mean number of micronucleated polychromatic erythrocytes at doses of 5 gm/kg. Bone marrow cytotoxicity was observed as measured by a decrease in mean percent of polychromatic erythrocytes.

1-Decene [CAS# 872-05-9]:

<u>LD50 (Oral-rat):</u>	over 10,000 mg/kg.
<u>LC50 (Inhalation-rat):</u>	9.3 mg/L. (1 hour exposure at saturation concentration)
<u>LC50 (Inhalation-rat):</u>	8.7 mg/L. (4 hours at saturation concentration)

Regarding 1-octene, 1-nonene, and 1-decene, see (RH2207000), (RA8550000), and (HE2071401) in the Registry of Toxic Effects of Chemical Substances (RTECS) for further information. Currently, the dimethylheptenes and trimethylheptenes do not have any RTECS references.

12. ECOLOGICAL INFORMATION

Ecological effects testing have not been conducted on this material; however, information is available concerning similar products and several major components. Nonenes, the major components of this product, are naturally occurring compounds. They are detectable in the volatile organic fraction and in about 6% of the lipid fraction of raw beef. They are also emitted from molds that grow on dust particles and when heating rapeseed, Canola, peanut, and soybean oils.

This alkene mixture will normally float on water with its lighter components evaporating rapidly. In stagnant or slow-moving waterways, this hydrocarbon layer can cover a large surface area. As a result, this covering layer might limit or eliminate natural atmospheric oxygen transport into the water. With time, if not removed, oxygen depletion in the waterway might be enough to cause a fish kill or create an anaerobic environment. This coating action can also be harmful or fatal to plankton, algae, aquatic animals, and water birds.

Ecotoxicity: A similar C8-C10, C9-rich alkenes mixture (CAS# 68526-55-6) was shown to cause harm to aquatic organisms and caused adverse effects in the aquatic environment. If spilled, this olefinic naphtha, its storage tank water bottoms and sludge, and any contaminated soil or water may be hazardous to human, animal, and fresh and saltwater aquatic life.

Mobility: Nonenes are volatile organic compounds and will partition rapidly in air. They leach through soil or sediment at a slow rate and are not expected to partition into the sediment or wastewater solids. Based on a classification scheme determined from a structure estimation method, the estimated Koc value of 935 indicates that 1-nonene is expected to have low mobility in soil.

Bioaccumulation Potential: An estimated BCF of 1843 was calculated for nonene, using a log Kow of 5.15 and a regression-derived equation. According to a classification scheme, this BCF suggests the potential for bioconcentration in aquatic organisms is very high. And, based upon actual spill incident investigations, similar olefinic naphthas have been shown to bioaccumulate in tissues of various fish from 1 ppm to 10 ppm levels.

Biodegradation: This product is inherently biodegradable. A study revealed that terminating alkenes were more recalcitrant compared to those alkenes with the double bond located elsewhere on the molecule. Researchers also noted that as the chain length of the alkene increased, so did the susceptibility to microbial attack. Nonene's linear hydrocarbon structure would suggest that biodegradation is an important process in soil and water.

Environmental Fate: If released to air, a vapor pressure of 5.40 mm Hg at 25°C indicates nonene will exist solely as a vapor in the ambient atmosphere. Vapor-phase nonene will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals and ozone; the half-life for these reactions in air is estimated to be 11 and 23 hours, respectively. Reaction of vapor-phase nonene with the nitrate radical may be an important night-time loss process based on its molecular structure.

If released to soil, nonene is expected to have low mobility based upon an estimated Koc of 935. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 0.7941 atm-m³/mole. Nonene may volatilize from dry soil surfaces based upon its vapor pressure. However, adsorption to soil is expected to attenuate volatilization.

If released into water, nonene is expected to adsorb to sediment and suspended solids in water based upon the estimated Koc. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant of 0.7941 atm-m³/mole. Estimated volatilization half-lives for a model river and model lake are 1 hour and 4.5 days, respectively. However, volatilization from water surfaces is expected to be attenuated by adsorption to sediment and suspended solids in the water column. The potential for volatilization of nonene from dry soil surfaces may exist based upon a vapor pressure of 5.15 mm Hg.

Atmospheric Oxidation: According to a model of gas/particle partitioning of semi-volatile organic compounds in the atmosphere, nonene, which has a vapor pressure of 5.40 mm Hg at 25°C, is expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase nonene is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 11 hours, from its rate constant of 3.44X10⁻¹¹ cm³/molecule-sec at 25°C determined using a structure estimation method. Vapor-phase nonene is also degraded in the atmosphere by reaction with ozone; the half-life for this reaction in air is estimated to be 23 hours, from its rate constant of 1.20X10⁻¹⁷ cm³/molecule-sec at 25°C. Reaction of vapor phase nonene with nitrate radical may be an important night-time loss process based on its molecular structure.

For additional ecological information concerning components of this product (see Section 2), one should refer to the Hazardous Substances Data Bank and the Oil and Hazardous Materials/Technical Assistance Data System (OHM/TADS) maintained by the U.S. National Library of Medicine.

13. DISPOSAL CONSIDERATIONS

Maximize material recovery for reuse or recycling. If spilled material is introduced into a wastewater treatment system, chemical and biological oxygen demand (COD and BOD) will likely increase. This material biodegradable if gradually exposed to microorganisms, preferable in an aerobic environment. In sewage-seeded wastewater, at or below concentrations of 0.2 vol.% of this material, there is little or no effect on bio-oxidation and/or digestion. However, at 1 vol.%, it doubles the required digestion period. Higher concentrations interfere with floc formation and sludge settling and also plug filters or the exchange bed. Vapor emissions from a bio-oxidation process contaminated with this material can be a health hazard.

Recovered non-usable material may be regulated by USEPA as a “hazardous waste” due to its ignitability (D001) characteristics. The user of this product is urged to consult local, state, and federal regulatory agency guidelines regarding proper disposal. In addition, conditions of use may cause this material to become a hazardous waste for other reasons, as defined by Federal or State regulations. Accordingly, it is the responsibility of the user to determine the proper storage, treatment, transportation, and /or disposable methodologies for spent materials and residues at the time of disposition. Transportation, treatment, storage, and disposal of waste material must be conducted in accordance with RCRA regulations (see 40 CFR Parts 260 through 271). State and /or local regulations might be even more restrictive. Contact the RCRA/Superfund Hotline at (800) 424-9346 or your regional USEPA office for guidance concerning case specific disposal issues.

14. TRANSPORTATION INFORMATION

<u>D.O.T. Proper Shipping Name:</u>	Tripropylene
<u>D.O.T. Hazard Class:</u>	3 (FLAMMABLE LIQUID placards or labels are required.)
<u>Packing Group:</u>	II or III
<u>U.N. Number:</u>	UN2057
<u>Emergency Response Guide:</u>	128 = Flammable Liquids (Non-Polar/Water-Immiscible)
<u>Special Shipping Data:</u>	Packing references (special provisions, exceptions, non-bulk, and bulk) for this product are dictated by 49 CFR 172.102(b)(IB2), (T4), and (TP1); 173.150; 173.202; and 173.242. Its quantity limitations for passenger aircraft and domestic rail are 5 liters; and, for cargo aircraft, its quantity limitation is 60 liters.
<u>Reportable Quantity:</u>	A Reportable Quantity (RQ) has not been established for any individual components of this mixture; however, 100 lbs. (45.4 kg) is appropriate for its ignitability (D001) hazard classification.
<u>International Information:</u>	<p><u>Sea (IMO/IMDG) Shipping Name:</u> Tripropylene EMS Number: <u>F-E, S-D</u></p> <p><u>Air (ICAO/IATA) Shipping Name:</u> Tripropylene For passenger aircraft, this product’s limited quantity maximum is 5 liters; for cargo aircraft, its quantity maximum is 60 liters.</p> <p><u>Canadian Transportation of Dangerous Goods Bill-of-Lading:</u> Tripropylene, 3, UN2057, PGII, Packing Instruction 305 or 307</p> <p><u>European Road/Rail (ADR/RID) Shipping Name:</u> UN2057, Tripropylene</p>

15. REGULATORY INFORMATION

OSHA: This product has been evaluated and is classified as Flammable and an Irritant under OSHA Hazard Communication Standard (29 CFR 1910.1200) criteria.

OSHA Required Label Information:

In compliance with right-to-know requirements, the following OSHA Hazard Warnings should be found on the label, bill-of-lading, or invoice accompanying each shipment of this product:

DANGER!
HIGHLY FLAMMABLE
HARMFUL IF INHALED OR SWALLOWED
SKIN, EYE, AND RESPIRATORY IRRITANT
TOXIC TO AQUATIC ORGANISMS

EPA:

Superfund Amendments and Reauthorization Act of 1989, Title III:

This product's components are not on the Extremely Hazardous Substance List, Sections 302/304.

This product is subject to provisions of Section 311 and 312.

This product does not contain any components at concentrations above de minimis levels and are listed as "Toxic Chemicals" in 40 CFR Part 372 pursuant to the requirements of Section 313 of SARA.

SARA Section 312 Hazard Categories as defined in 40 CFR 370.2:

Fire, Acute (Immediate) Health, and possibly Chronic (Delayed) Health.

Toxic Substances Control Act:

All of the components displayed in Section 2 are listed on the TSCA Inventory.

Clean Air Act:

This material contains Octene and Nonene Isomers which are classified as "hazardous air pollutants" under USEPA, Texas, California, and New York regulations. These smog producing pollutants are ranked according to their Maximum Incremental Reactivity (MIR) Equivalency Factors. The reactivity index shows that 3-Octene has a 7.528 factor and 1-Nonene has a 3.06 factor.

Regulations promulgated pursuant to the Clean Air Act – Section 112(r) (40 CFR 68.130), the EPA requires development, implementation, and submission of risk management plans (RMPs) for facilities that manufacture, process, use, or otherwise handle regulated substances in quantities that exceed listed thresholds (10,000 pounds). Substances present in this product which are subject to this statute are: 1-Octene and 1-Nonene.

In regulations promulgated pursuant to the Clean Air Act – Section 111 "Standards of Performance for New Stationary Sources" (40 CFR 60.489), the EPA classified the following components in this material as a "Volatile Organic Compounds (VOCs)" which contribute significantly to air pollution/smog which endangers public health and welfare": C8 Alkenes, C9 Alkenes, C10 Alkenes, and C11 Alkenes.

This product contains up to 100 percent VOCs per 40 CFR 51.100 which are subject to compliance with the emission standards set forth in subparts of 40 CFR Part 60. This product does not contain any Class 1 or Class 2 Ozone Depletors.

Clean Water Act:

None of the components in this product are listed as Priority Pollutants or Toxic Pollutants under the CWA. This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980:

CERCLA requires notification of the National Response Center concerning release of quantities of "Hazardous Substances" equal to or greater than the reportable quantities (RQ's) listed in 40 CFR 302.4. As defined by CERCLA, the term "hazardous substance" does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically designated in 40 CFR 302.4. This product or refinery stream is not known to contain chemical substances subject to this statute. However, it is recommended that you contact state and local authorities to determine if there are any other reporting requirements in the event of a spill. This product has a 100 pounds RQ based upon its hazardous substance ignitability (D001) classification.

Federal Hazardous Substances Act, related statutes, and the Consumer Product Safety Commission regulations, as defined by 16 CFR 1500.14(b)(3) and 1500.83(a)(13):

This product contains "Petroleum Distillates" which may require special labeling if distributed in a manner intended or packaged in a form suitable for use in the household or by children. Precautionary label dialogue should display the following:

DANGER! CONTAINS PETROLEUM DISTILLATES!
HARMFUL OR FATAL IF SWALLOWED!
CALL PHYSICIAN IMMEDIATELY.
KEEP OUT OF REACH OF CHILDREN!

The California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) requires warning be given for ingredients known to the State of California to cause cancer, birth defects, or other reproductive toxicity. To the best of our knowledge, this product does NOT contain any known chemical substances subject to this statute.

States:

Octene and Nonene can be found on the following state Right-to-Know lists: Florida, New Jersey, Pennsylvania, and Massachusetts.

International Regulations:

Canada – World Hazardous Materials Identification System (WHMIS):

This product is a Controlled Product under WHMIS classification. 1-Octene, Nonenes, Dimethylheptenes, and Trimethylheptenes have Class B, Division 2 (Flammable Material) and Class D, Division 2 (Materials Causing Other Toxic Effects), Subdivision B (Skin and Eye Irritation) classifications.

Canada – Designated Substance List (DSL)/Non-Designated Substance List (NDSL):

All components displayed in Section 2 are listed on Canada's DSL List.

All components displayed in Section 2 are listed on the European Community Inventory (EINECS/ELINCS), Japanese Inventory (MITI), Australian Inventory (AICS), People's Republic of China Inventory (IECS), Korean Inventory (ECL), and Philippine Inventory (PICCS).

1-Octene (EC# 203-893-7), Nonenes, and Dimethylheptenes are "hazardous materials" according to European Community Directive 67/548/EC.

Risk/Safety Statements for Labeling in Accordance with European Union Directive 2001/59/EC:

Hazard Symbols: **F** and **Xn**

Risk Phrases:

R11: Highly flammable.

R18: In use, may form flammable/explosive vapour-air mixture.

R19: May form explosive peroxides.

R36/R37/R38: Irritating to eyes, respiratory system, and skin.

R51: Toxic to aquatic organisms.

R53: May cause long-term adverse effects in the aquatic environment.

R65: Harmful: may cause lung damage if swallowed.

R66: Repeated exposure may cause skin dryness or cracking.

R67: Vapours may cause drowsiness and dizziness.

R68/R20/R22: Harmful: possible risk of irreversible effects through inhalation and if swallowed.

Safety Phrases:

S2: Keep out of reach of children.

S3/R14: Keep in a cool place and away from oxidizers, strong acids, and halogens.

S7/S8/S9: Keep container tightly closed, dry, and in a well-ventilated place.

S15/S16: Keep away from heat and sources of ignition. – No smoking.

S18: Handle and open container with care.

S20/S21: When using, do not eat, drink, or smoke.

S24/S25: Avoid contact with skin and eyes.

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S27/S28: After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of soap and water.

S33 Take precautionary measures against static discharges.

S36/S37/S39: Wear suitable protective clothing, gloves, and eye/face protection.

S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label).

S47: Keep containers at temperatures not exceeding 21°C. (70°F.).

S29/S56: Do not empty into drains; must dispose of this material and its container at hazardous or special waste collection point.

S61: Avoid release to the environment. Refer to special instructions/safety data sheet.

S62: If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label.

16. OTHER INFORMATION

The information presented herein is to the best of the company's knowledge true and reliable. This information is supplied for informational purposes only, and without any guarantee or warranty, expressed or implied, regarding its accuracy, correctness, or completeness. Since the actual use of the product by others is beyond our control, Texas Petrochemicals LP assumes no responsibility or liability for loss, damage, or expense arising out of any use by others of the product(s) referred to herein.

This is the initial version of this Material Safety Data Sheet.