

Material Safety Data Sheet

Material Name: **Crude Propylene**

MSDS ID: NOVA-0013

Section 1 - Product and Company Identification

Synonyms: Joffre C3 Intermediate Product**Chemical Name:** Propylene mixture**Chemical Family:** Hydrocarbons, alkenes**Material Use:** Raw material for manufacture of chemicals and polymers**Chemical Formula:** C₃H₆ (propylene)**NOVA Chemicals**

P.O. Box 2518, Station M

Calgary, Alberta, Canada T2P 5C6

Product Information: 1-412-490-4063**EMERGENCY Telephone Numbers:****North America (Canada and US):**

1-800-561-6682, 1-403-314-8767 (NOVA Chemicals) (24 hours)

1-800-424-9300 (CHEMTREC-USA) (24 hours)

1-613-996-6666 (Canutec-Canada) (24 hours)

Mexico and South America: +44 208 762 8322 (NCEC) (24 hours)**General Comments**

This product has been assigned a CAS# of 115-07-1

Section 2 - Composition / Information on Ingredients

CAS #	Component	Percent by Wt.
115-07-1	Propylene	65 - 89
74-98-6	Propane	8 - 32
Mixture	MAPD (methyl acetylene & propadiene)	1 - 6
106-99-0	1,3-Butadiene	0.1 - 1

Additional Information

* This product may contain very low levels of Naturally Occurring Radioactive Materials (NORM), which have been identified as Radon 222 and its main radioactive decay product Lead 210. See Section 16- Special Considerations.

This product is considered to be hazardous under 29 CFR 1910.1200 (Hazard Communication).

This material is a controlled product under Canadian WHMIS regulations.

This material is regulated as a hazardous material / dangerous goods for transportation.

See Section 8 for applicable exposure limits. See Section 11 for applicable toxicity data.

Section 3 - Hazards Identification

HMIS Ratings: Health: 1 Fire: 4 Physical Hazard: 1 Pers. Prot.: chemical goggles, gloves, respirator, coveralls*Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard***NFPA Ratings: Health: 1 Fire: 4 Reactivity: 1***Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe***Emergency Overview**

DANGER! EXTREMELY FLAMMABLE LIQUEFIED GAS. This product is a colorless liquefied gas with a sweet hydrocarbon odor. Propylene is highly volatile, when released it will disperse as a highly flammable vapor cloud. Consider need for immediate emergency isolation and evacuation. Vapors are heavier than air and may travel along ground to some distant source and flash back. **DO NOT ATTEMPT TO EXTINGUISH A GAS FIRE UNLESS LEAK SOURCE CAN BE ISOLATED AND SHUT OFF.** Contact with liquefied gas may cause frostbite. Excessive inhalation of this material causes headache, dizziness, nausea and loss of coordination and in extreme conditions coma and possibly death.

Potential Health Effects: Eyes

Contact with the product as a liquefied gas may cause severe injury or frostbite to the eyes. Contact with the gas may be mildly irritating.

Potential Health Effects: Skin

Contact with the product as a liquefied gas may result in frostbite and blistering of the skin. Contact with the gas may be mildly irritating. Product does not penetrate through the skin.

Potential Health Effects: Ingestion

Ingestion of this product is extremely unlikely. However, contact of the liquefied gas may result in serious injury or frostbite to the lips, mouth, and throat.

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Potential Health Effects: Inhalation

This product is a mildly narcotic asphyxiant gas that can cause unconsciousness/death if OXYGEN levels are sufficiently reduced. Excessive inhalation of this material causes headache, dizziness, nausea and loss of coordination, and in extreme conditions coma and possibly death. High concentrations may trigger heartbeat irregularities, and possible cardiac sensitization.

Section 4 - First Aid Measures

First Aid: Eyes

Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.

First Aid: Skin

For skin contact with liquefied gas, thaw frostbite slowly with lukewarm water. DO NOT RUB affected area. Do not pull off adherent clothing or objects. Seek medical attention at once. For skin contact with the gas, wash affected area with soap and water, and seek medical attention if any irritation or burn occurs.

First Aid: Inhalation

Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband. Assist breathing if necessary. Seek immediate medical attention. WARNING: Contact through mouth-to-mouth resuscitation may pose a secondary risk to the rescuer. Avoid mouth-to-mouth contact by using a mouth shield or guard to perform artificial respiration.

First Aid: Ingestion

Ingestion of this product is extremely unlikely. However, if ingestion is suspected, DO NOT INDUCE VOMITING. Examine the lips and mouth to determine whether the tissues are damaged. Thaw frostbite slowly with lukewarm water, ensuring that the individual does not gag or choke. Loosen tight clothing such as a collar, tie, belt or waistband. Assist breathing if necessary. Seek immediate medical attention.

First Aid: Notes to Physician

For more detailed medical emergency support information call 1-800-561-6682, 1-403-314-8767 (24 hours, NOVA Chemicals Emergency Response). Treat unconsciousness, frostbite, nausea, hypotension, seizures, and cardiac arrhythmias in the conventional manner. Sympathomimetics or catecholamines should be avoided or used with caution (lowest effective dose) because of possible cardiac sensitization. Administer oxygen by mask if there is respiratory distress. Treatment for overexposure should be directed at controlling the symptoms and clinical condition of the patient. After adequate first aid, no further treatment is necessary, unless symptoms reappear.

Section 5 - Fire Fighting Measures

See Section 9: Physical Properties for flammability limits, flash point and autoignition information.

General Fire Hazards

Fire and container explosion hazards are extremely high when this product is exposed to heat or flame. Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back. DO NOT ATTEMPT TO EXTINGUISH A GAS FIRE UNLESS LEAK SOURCE CAN BE ISOLATED AND SHUT OFF. Consider initial evacuation for 800 meters (1/2 mile) in all directions. If a large tank, rail car, or tank truck is involved in a fire, ISOLATE for 1600 meter (1 mile) in all directions.

Explosion Hazards

Vapors may form an explosive mixture with air. Keep containers away from source of heat or fire. Highly explosive in the presence of sparks, fire, heat and oxidizing agents. Evacuate personnel to a distance of 1600 meters (one mile) if during a fire, a rupture of a rail car, tank car, or major vessel is possible.

Hazardous Combustion Products

Under fire conditions, this product emits carbon monoxide, carbon dioxide, and/or low molecular weight hydrocarbons.

Extinguishing Media

Dry chemical, foam, carbon dioxide, water fog, or water spray. Use massive quantities of water to cool fire-exposed containers and to protect personnel. DO NOT ATTEMPT TO EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK SOURCE CAN BE ISOLATED AND SHUT OFF.

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Fire Fighting Equipment/Instructions

Position upwind. Keep unnecessary personnel away. Move containers from fire area if you can do so without risk. Fight fire from maximum distance or use unmanned holders or monitor nozzles. Fire fighters should wear full-face, self-contained breathing apparatus and impervious protective clothing. Avoid inhaling any smoke and combustion products. Remove and clean or destroy any contaminated clothing. Immediately withdraw in case of fire and tank venting or heat discoloration of a tank. Let uncontrolled fires burn off. Cool containers with flooding quantities of water until well after the fire is out. Monitor water run-off for flammability, and control runoff waters to prevent entry into sewers, drains, underground or confined spaces, and waterways.

Reference North America Emergency Response Guide No. 115 for additional details and instructions.

Section 6 - Accidental Release Measures

Evacuation Procedures

Isolate area. Keep unnecessary personnel away. Alert stand-by emergency and fire fighting personnel

Small Spills

Isolate spill or leak area for 100 meters (330 feet). Eliminate all potential ignition sources. Stop leak remotely or when safe to do so. Ground all approved equipment used in area. Keep area isolated until any detectable flammable gas has been dispersed.

Large Spills

Consider initial downwind evacuation for at least 800 meters (1/2 mile). Eliminate all potential ignition sources. Stop leak remotely or when safe to do so. Alert stand-by emergency and fire fighting personnel. Monitor surrounding area for build-up of flammable air concentrations. Ground all approved equipment used in area. Evacuate personnel to upwind of the spill area, and positioned at a safe distance. Do not enter spill area unless critical to do so. Personnel who are required to enter the spill area must wear SCBA and other appropriate thermal protective equipment. Prevent flammable vapors or liquids from entering drains and sewers, or other confined or underground structures. Accumulations of gas may persist in low areas. Keep area isolated until any detectable flammable gas has been dispersed.

Special Procedures

Contact local police/emergency services and appropriate emergency telephone numbers provided in Section 1. Ensure that statutory and regulatory reporting requirements in the applicable jurisdiction are met.

Wear appropriate protective equipment and clothing during clean-up. Individuals without appropriate protective equipment should be excluded from area of spill until cleanup has been completed.

See Section 8 for recommended Personal Protective Equipment and Section 13 for waste disposal considerations.

Section 7 - Handling and Storage

Handling Procedures

Handle in fully enclosed, grounded, properly designed and approved liquefied pressurized gas systems. Keep away from heat and ignition sources. Avoid skin and eye contact. Wear suitable protective equipment including thermally protective gloves. No smoking or open flames permitted in storage, use or handling areas. Dissipate static electricity during transfer by grounding and bonding containers and equipment. Take special precaution when cold cutting or breaking into lines, or when cleaning and disposing of empty containers. Where possible, collect and flare vents. Radioactive decay products may accumulate over time in scale or deposits in processing equipment (e.g.: pumps, filters, piping, etc.). Equipment and piping should be checked for possible treatment (decontamination) prior to maintenance or disposal/salvage.

Storage Procedures

Storage area should be clearly identified, well illuminated, clear of obstruction and accessible only to trained and authorized personnel. Store in grounded, properly designed and approved pressure containers and away from incompatible materials. Store and use away from heat, sparks, open flame, or any other ignition source. Store according to applicable codes or regulations for liquefied pressurized gases as applicable to cylinders, vessels, piping, buildings, rooms, cabinets, allowable quantities and minimum storage distances. Have appropriate extinguishing capability in storage area (e.g. sprinkler system, portable fire extinguishers, and flammable gas detectors). Equip storage vessel vents with a flame arrestor. Storage pressure vessels should be above ground and diked. Keep cylinders secure while in storage or in transportation. A refrigerated room is generally recommended for warehouse storage of materials with a flash point lower than 37.8°C (100°F).

See Section 8 for recommended Personal Protective Equipment and see Section 10 for information on incompatibilities.

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Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines

A: General Product Information

Follow all applicable exposure limits. Ensure that eyewash stations and safety showers are proximal to the workstation location. Use non-sparking, grounded ventilation systems separate from other exhaust systems.

B: Component Exposure Limits

ACGIH, OSHA, NIOSH, EPA, Alberta, and Ontario exposure limit lists have been checked for major components listed with CAS registry numbers. Other exposure limits may apply, check with proper authorities.

Propylene (115-07-1)

ACGIH: Simple Asphyxiant
500 ppm TWA; A4 - not classifiable as a human carcinogen; TLV basis: asphyxiant, irritation (nasal)
Alberta: Simple asphyxiant
Ontario: Simple asphyxiant

Propane (74-98-6)

ACGIH: 1000 ppm TWA (listed under Aliphatic hydrocarbon gases alkane C1-C4)
OSHA: 1000 ppm TWA; 1800 mg/m3 TWA
NIOSH: 1000 ppm TWA; 1800 mg/m3 TWA
2100 ppm IDLH
Alberta: 1000 ppm TWA; 1800 mg/m3 TWA
1500 ppm STEL; 2700 mg/m3 STEL

MAPD (methyl acetylene & propadiene) (Not Available)

ACGIH: 1000 ppm TWA (related to Methyl acetylene)
OSHA: 1000 ppm TWA; 1650 mg/m3 TWA (related to Methyl acetylene (Propyne))
NIOSH: 1000 ppm TWA; 1650 mg/m3 TWA (related to Methyl acetylene)
1700 ppm IDLH (related to Methyl acetylene)
Alberta: 1000 ppm TWA; 1640 mg/m3 TWA (related to Methyl acetylene)

1,3-Butadiene (106-99-0)

ACGIH: 2 ppm TWA
OSHA: 1 ppm TWA (8 hr); 5 ppm STEL (15 min); 0.5 ppm Action Level (See 29 CFR 1910.1051)
NIOSH: 2000 ppm IDLH
Alberta: 2 ppm TWA; 4.4 mg/m3 TWA

ENGINEERING CONTROLS

Engineering methods to reduce hazardous exposure are preferred controls. Methods include mechanical ventilation (dilution and local exhaust) process or personal enclosure, remote and automated operation, control of process conditions, leak detection and repair systems, and other process modifications. Ensure all exhaust ventilation systems are discharged to outdoors, away from air intakes. Supply sufficient replacement air to make up for air removed by exhaust systems. Administrative (procedure) controls and use of personal protective equipment may also be required.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses. Use of a chemical goggles and a full-face shield or respirator is recommended if contact with liquefied gas is possible, or to prevent eye irritation from gases.

Personal Protective Equipment: Skin/Hands/Feet

Use impervious gloves when handling product. Wear chemical-resistant safety footwear with good traction to prevent slipping. Work clothing that sufficiently prevents skin contact should be worn, such as coveralls and/or long sleeves and pants. Wear special gloves and clothing designed to prevent freezing of body tissues if contact with liquefied gas is possible. Remove contaminated clothing, shoes/boots, and other protective equipment, check for potential flammability hazard, and completely decontaminate before reuse or discard. Fire resistant (i.e., Nomex) or natural fiber clothing (i.e., cotton and wool) is recommended. Synthetic clothing can generate static electricity and is not recommended where flammable vapors release may occur.

Personal Protective Equipment: Respiratory

If engineering controls and ventilation is not sufficient to prevent build up of aerosols, vapors or dusts, appropriate NIOSH/ MSHA approved air-purifying respirators or self-contained breathing apparatus (SCBA) appropriate for exposure potential should be used. Air supplied breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air purifying respirators.

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Personal Protective Equipment: General

Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain, and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.

Section 9 - Physical & Chemical Properties

Physical State and Appearance:	Gas at room temperature, liquid under pressure	Color:	Colorless
Odor:	Faint hydrocarbon	Odor Threshold:	20 ppm, but not reliable as a warning property
pH:	Not applicable, gas	Vapor Pressure:	10 atm @21 to 24°C (70 to 75°F)
Vapor Density @ 0°C (Air=1):	1.5	Dispersion Properties:	Is not dispersed in cold water, hot water
Melting Point:	-185 to -190°C (-301 to -310°F)	Boiling Point:	-46 to -48°C (-51 to -54°F)
Specific Gravity (Water=1):	Not applicable, gas; 0.53 (propylene, liquefied)	Solubility (H2O):	Slight (0.1% @21°C); rapidly volatilizes
Evaporation Rate (n-Butyl Acetate=1):	Not applicable, gas	Softening Point:	Not applicable, gas
Octanol/H2O Coeff.:	1.77	Percent Volatile:	100%
Flammability Classification:	Extremely Flammable	Auto Ignition:	455°C (851°F)
Flash Point:	-108°C (-162°F) minimum	Flash Point Method:	Closed cup
Lower Flammable Limit (LFL):	2% (propylene)	Upper Flammable Limit (UFL):	11% (propylene)

Section 10 - Stability & Reactivity Information

Chemical Stability

This material is stable under normal use conditions for shock, vibration, pressure, and ambient temperature.

Chemical Stability: Conditions to Avoid

Keep away from heat, sparks, or open flame. Many materials become brittle after contact with liquefied gases, and may fail without warning. Carefully select and test equipment, gaskets, and hoses periodically to ensure integrity and compatibility.

Incompatibility

Nitrates, perchlorates, nitrogen oxides including nitrogen dioxide, nitrous oxide and nitrogen tetroxide.

Hazardous Polymerization

Not likely to occur. Under favorable and designed conditions, may polymerize with metal coordination complexes or mixtures of lithium nitrate and sulfur dioxide.

Corrosivity

Not considered to be corrosive.

Hazardous Decomposition

Upon decomposition, this product emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

Special Remarks

Vapors may form an explosive mixture with air. May react vigorously with oxidizing agents. Liquefied gas may explode on contact with hot water (45-75 °C).

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Section 11 - Toxicological Information

A: Acute Toxicity - General Material Information

Similar hydrocarbon mixtures have been tested under the EPA's High Production Volume (HPV) program. Propylene has a low order of acute toxicity. Inhalation of propylene can produce narcosis and anesthesia; however, these effects are only seen at very high concentrations (reports indicate >46,000 ppm to induce narcosis in humans). Excessive exposures may cause headache, dizziness, nausea, loss of coordination, and in extreme conditions coma and possibly death. High concentrations may trigger heartbeat irregularities and possible cardiac sensitization. In the gaseous state propylene is NOT expected to be irritating to the skin or eyes. However, should skin or eye contact occur with this product in its liquid state, tissue freezing, severe cold burn, and/or frostbite may result.

B: Acute Toxicity - LD50/LC50

Propylene (115-07-1)

Inhalation LC50 Rat: 658 mg/L/4H

Propane (74-98-6)

Dermal LD50 Rat: 658 mg/kg

1,3-Butadiene (106-99-0)

Inhalation LC50 Rat: 485 mg/L/4H; Oral LD50 Rat: 5480 mg/kg

C: Chronic Toxicity - General Material Information

Similar hydrocarbon mixtures have been tested under the EPA's High Production Volume (HPV) program. Repeated exposure to propylene produce no clinical effects in animals exposed to concentrations up to 10,000 ppm, one half of the lower flammability limit, for 103 weeks. In the nasal cavity, propylene induced squamous metaplasia of the respiratory epithelium in male and female rats and epithelial hyperplasia in female rats; however, recent re-evaluation of this study and new data indicate there is no dose-response. Ciliberti et al (1988) - chronic inhalation testing of propylene in rats and mice (0, 200, 1,000, 5000 ppm 7hrs/day, 5 days per week). Results indicated no carcinogenic effects found.

A weak mutagenic response was observed with *Salmonella Typhimurium* strains TA 1535 exposed to 3,125-100% of propylene in the presence of S9 mix but not in absence of S9. It was not mutagenic in the other *Salmonella* strains (TA 100, TA98 and TA1537) or in *E.coli* WP2uvrA (pkm 101).

Propane was not found to be mutagenic in Ames *Salmonella*/microsome test (Kirwin et al, 1980).

Methylacetylene: A single study has indicated mutagenicity in *E.Coli*.

Propadiene Mixture: Studies indicate that this is a comparatively low toxic material. Rats, rabbits, dogs and guinea pigs were exposed at 1,000 ppm and 5,000 ppm; 7 hours/day, 5 days/week for 16 weeks. All species exposed to 1,000 ppm showed no adverse effects on either sex. At 5,000 ppm, male rats and guinea pigs experienced decreased body weights.

1,3- Butadiene - Chronic exposure may cause irritation effects and hematological changes. Elevated incidence of lymphomas, leukemias, and other neoplastic diseases of the blood system are found in studies of BD monomer production workers. Has caused cancer in animal studies.

D: Chronic Toxicity - Carcinogenic Effects

ACGIH, EPA, IARC, OSHA, and NTP carcinogen lists have been checked for selected similar materials or those components with CAS registry numbers.

Propylene (115-07-1)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Monograph 60, 1994 (Group 3 (not classifiable))

1,3-Butadiene (106-99-0)

ACGIH: A2 - Suspected Human Carcinogen

OSHA: 1 ppm TWA (8 hr); 5 ppm STEL (15 min); 0.5 ppm Action Level (See 29 CFR 1910.1051)

EPA: Classification: human carcinogen; last revised: 11/05/2002; basis: Human data and sufficient rodent (mouse and rat) studies in which exposure to airborne concentrations of 1,3-butadiene caused multiple tumors and tumor types form the basis for this classification. Inhalation risk fact = 3E-5 per µg/m3; tumor type = leukemia; animals tested = human; route = inhalation

NTP: Known Carcinogen

IARC: Monograph 71, 1999 (Group 2A (probably carcinogenic to humans))

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E. Special Remarks on Toxicity

Propylene that is inhaled is largely exhaled unchanged. A small fraction may be metabolized and transported in blood as propylene oxide. There is no known health effect found to be associated with this metabolism in 2-year cancer studies of potential adverse genetic effects.

Section 12 - Ecological Information

Ecotoxicity

A: General Product Information

Similar hydrocarbon mixtures have been reviewed under the EPA's High Production Volume (HPV) program. Since Propylene streams tested are gaseous at ambient temperature and pressure, they will partition predominantly to the atmosphere. The ECOSAR model was used to predict aquatic toxicity using the equation for neutral organics, a reliable estimation method for this class of chemicals:

96 Hour LC50 Fish: 51.3 mg/L; 48 Hour EC50 Invertebrate: 54.1 mg/L; 96 Hour LC50Algae: 33.4 mg/L

Calculated toxicity values for two to four day exposures suggest that propylene gas mixtures have the potential to produce moderate toxicity.

B: Component Analysis - Ecotoxicity - Aquatic/Terrestrial Toxicity

1,3-Butadiene (106-99-0)

24 Hr LC50 pinperch: 71.5 mg/L

Environmental Fate/Mobility

Similar hydrocarbon mixtures have been tested under the EPA's High Production Volume (HPV) program. Product is largely insoluble in water, and evaporates rapidly from surface soil and water. Potential for mobility in soil is considered to be moderate. In the air, these constituents have the potential to rapidly degrade through indirect photolytic processes mediated primarily by hydroxyl radicals. This is expected to be the dominant route of loss and degradation process for propylene and other components.

Persistence/Degradability

Similar hydrocarbon mixtures have been reviewed under the EPA's High Production Volume (HPV) program. Propylene and other volatile hydrocarbons will photo degrade in air rapidly (2 to 14 days) depending on atmospheric conditions. Biodegradation is unlikely to contribute to the overall degradation of constituents from these streams because they partition rapidly to the air compartment.

Studies have demonstrated that bacteria isolated from soil and surface water samples can degrade the predominant category constituents.

Bioaccumulation/Accumulation

Similar hydrocarbon mixtures have been tested under the EPA's High Production Volume (HPV) program. Bioconcentration potential is considered low, with the Log K_{ow} of 1.77 for propylene.

Section 13 - Disposal Considerations

U.S./Canadian Waste Number & Descriptions

A: General Product Information

This material may generate hazardous waste according to US and Canadian regulations. Contact federal, provincial/state and local authorities in order to ship a waste material associated with this material to ensure materials are handled appropriately and meet all criteria for disposal of hazardous waste. Vent waste gases to a flare at an approved facility. DO NOT ATTEMPT TO DISPOSE OF BY UNCONTROLLED IGNITION.

See Section 7: Handling and Storage and Section 8: Exposure Controls/Personal Protection for additional information that may be applicable for safe handling and the protection of employees.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

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Section 14 - Transportation Information

US DOT Information

Shipping Name: Propylene

UN # UN1077 **Hazard Class:** 2.1

Required Label(s): FLAMMABLE GAS

Additional Info.: NOTE: The Reportable Quantity for butadiene is 10 lbs.(4.54 kg). For shipments, in a single container, exceeding the RQ for butadiene the letters RQ must appear in the proper shipping name.

These hazardous materials may be handled, offered for transport or transported under the UN number and shipping name UN1075, LIQUEFIED PETROLEUM GAS.

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Canadian TDG Information

Shipping Name: Propylene

UN # UN1077 **Hazard Class:** 2.1

Required Label(s): FLAMMABLE GAS

Additional Info.: These dangerous goods may be handled, offered for transport or transported under the UN number and shipping name UN1075, LIQUEFIED PETROLEUM GASES OR GAZ DE PETROLE LIQUEFIES.

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International Air Transport Association (IATA) and ICAO Regulations

Shipping Name: Propylene

UN # UN1077 **Hazard Class:** 2.1

Required Label(s): FLAMMABLE GAS

International Maritime Dangerous Goods (IMDG) Regulations

Shipping Name: Propylene

UN # UN1077 **Hazard Class:** 2.1

Required Label(s): FLAMMABLE GAS

Additional Info.: EmS No.: F-D, S-U

Section 15 - Regulatory Information

A: International Regulations

Component Analysis - International Inventory Status

Component	CAS #	US - TSCA	CANADA - DSL	EU - EINECS
Propylene	115-07-1	Yes	Yes	Yes
Propane	74-98-6	Yes	Yes	Yes
1,3-Butadiene	106-99-0	Yes	Yes	Yes

B: USA Federal & State Regulations

Ongoing occupational hygiene, medical surveillance programs, or site emission or spill reporting may be required by Federal or State regulations. Check for applicable regulations.

USA OSHA Hazard Communication Class

HCS CLASS: Flammable gas

HCS CLASS: Carcinogen (1,3 butadiene)

HCS CLASS: Toxic (1,3 butadiene)

USA Right-to-Know - Federal

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Propylene (115-07-1)

SARA 313: 1.0 % de minimis concentration

1,3-Butadiene (106-99-0)

SARA 313: 0.1 % de minimis concentration

CERCLA: 10 lb final RQ; 4.54 kg final RQ

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USA Right-to-Know - State

The following components appear on one or more of the following state hazardous substances lists. Some components (including those present only in trace quantities, and therefore not listed in this document) may be included on the Right To Know lists of other U.S. states. The reader is therefore cautioned to contact his or her NOVA Chemicals representative or NOVA Chemicals' Product Integrity group for further U.S. State Right To Know information.

Component	CAS	NJ	PA
Propylene	115-07-1	Yes	Yes
Propane	74-98-6	Yes	Yes
MAPD (methyl acetylene & propadiene) (¹ related to Methyl acetylene) (² related to 1-Propyne)	Not Available	Yes ¹	Yes ²
1,3-Butadiene	106-99-0	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

C: Canadian Regulations - Federal and Provincial

Canadian Environmental Protection Act (CEPA): All components of this product are on the Domestic Substances List (DSL), and are acceptable for use under the provisions of CEPA.

WHMIS Ingredient Disclosure List (IDL)

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List (IDL):

Component	CAS #	Minimum Concentration
MAPD (methyl acetylene & propadiene)	Not Available	1 % (related to Methyl acetylene (Propyne))
1,3-Butadiene	106-99-0	0.1 %

WHMIS Classification

Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with Canadian Controlled Product Regulations (CPR) hazard criteria and this MSDS contains complete CPR-required information.

WHMIS CLASS A: Compressed gas

WHMIS CLASS B1: Flammable gas

WHMIS CLASS D2A, D2B Material causing other toxic effect/Carcinogen (1,3-Butadiene)

Provincial Regulations

Ongoing occupational hygiene, medical surveillance programs, or site emission or spill reporting may be required by Federal or Provincial regulations. Check for applicable regulations.

Section 16 - Other Information

Label Information

DANGER! EXTREMELY FLAMMABLE LIQUEFIED GAS. This product is a colorless liquefied gas with a sweet hydrocarbon odor. Propylene is highly volatile, when released it will disperse as a highly flammable vapor cloud. Consider need for immediate emergency isolation and evacuation. Vapors are heavier than air and may travel along ground to some distant source and flash back. DO NOT ATTEMPT TO EXTINGUISH A GAS FIRE UNLESS LEAK SOURCE CAN BE ISOLATED AND SHUT OFF. Contact with liquefied gas may cause frostbite. Excessive inhalation of this material causes headache, dizziness, nausea and loss of coordination and in extreme conditions coma and possibly death.

FIRST AID:

EYES: Remove contact lenses, if it can be done safely. Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.

SKIN: For skin contact with liquefied gas, thaw frostbite slowly with lukewarm water. DO NOT RUB affected area. Do not pull off adherent clothing or objects. Seek medical attention at once. For skin contact with the gas, wash affected area with soap and water, and seek medical attention if any irritation or burn occurs.

INHALATION: Move affected individual to non-contaminated air. Loosen tight clothing such as a collar, tie, belt or waistband. Assist breathing if necessary. Seek immediate medical attention. WARNING: Contact through mouth-to-mouth resuscitation may pose a secondary risk to the rescuer. Avoid mouth-to-mouth contact by using a mouth shield or guard to perform artificial respiration.

INGESTION: Ingestion of this product is extremely unlikely. However, if ingestion is suspected, DO NOT INDUCE VOMITING. Examine the lips and mouth to determine whether the tissues are damaged. Thaw frostbite slowly with lukewarm water, ensuring that the individual does not gag or choke. Loosen tight clothing such as a collar, tie, belt or waistband. Assist breathing if necessary. Seek immediate medical attention.

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Material Name: **Crude Propylene**

MSDS ID: NOVA-0013

IN CASE OF A LARGE SPILL: Consider initial downwind evacuation for at least 800 meters (1/2 mile). Eliminate all potential ignition sources. Stop leak remotely or when safe to do so. Alert stand-by emergency and fire fighting personnel. Monitor surrounding area for build-up of flammable air concentrations. Ground all approved equipment used in area. Evacuate personnel to upwind of the spill area, and positioned at a safe distance. Do not enter spill area unless critical to do so. Personnel who are required to enter the spill area must wear SCBA and other appropriate thermal protective equipment. Prevent flammable vapors or liquids from entering drains and sewers, or other confined or underground structures. Accumulations of gas may persist in low areas. Keep area isolated until any detectable flammable gas has been dispersed.

References

Available on request

Special Considerations- NORM

This information is given to call attention to the issue of Naturally Occurring Radioactive Material (NORM) contamination. Industry experience has shown that this product may contain small amounts of Radon-222 (Rn-222) and its radioactive decay products.

Radon-222 is a naturally occurring radioactive gas that has been found to be a contaminant in natural gas. During processing, Rn-222 tends to be concentrated in the liquefied petroleum gas stream and in product streams having a similar boiling point range. Although Rn-222 levels in this product do not present any direct radon exposure, customers should be aware of the potential for buildup of Rn-222 decay products within their processing streams. The concentration of Rn-222 decay products in processing equipment (e.g.: pumps, filters, piping, etc.) may accumulate to a point where gamma radiation is detected outside of this equipment during normal operations.

Field studies quoted in the literature, and those conducted by company personnel, have not shown any conditions, which subject workers to cumulative exposures that may exceed regulated limits. Equipment emitting gamma radiation should be presumed to be internally contaminated with alpha-emitting decay products (i.e.: Lead-210, Polonium-210). These decay products may be a health hazard if inhaled or ingested. Equipment and piping should be checked for possible treatment (decontamination) prior to maintenance or disposal/salvage.

Protective equipment (e.g.: coveralls, gloves, and a respirator with HEPA filters, or supplied air) should be worn by personnel entering a vessel or working on contaminated process equipment to prevent skin contamination, ingestion, or inhalation of any NORM contaminated residue. Airborne contamination may be minimized by handling contaminated materials in a wet state.

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; BLEVE = Boiling Liquid Expanding Vapor Explosion; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CPR = Controlled Products Regulations; DOT = Department of Transportation; DSL = Domestic Substances List; EINECS = European Inventory of Existing Commercial Substances; EPA = Environmental Protection Agency; EU = European Union; FDA = Food and Drug Administration; IARC = International Agency for Research on Cancer; IDL = Ingredient Disclosure List; Kow = Octanol/water partition coefficient; LEL = Lower Explosive Limit; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; RCRA = Resource Conservation and Recovery Act; SARA = Superfund Amendments and Reauthorization Act; TDG = Transportation of Dangerous Goods; TSCA = Toxic Substances Control Act.

MSDS Prepared by: NOVA Chemicals


MSDS Information Phone Number: 1-412-490-4063

Other Information

Notice to Reader

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