

**6. ACCIDENTAL RELEASE MEASURES**

Issue warning "Combustible". Eliminate all ignition sources. Isolate hazard area and restrict access. Handling equipment must be grounded. Try to work upwind of spill. Avoid direct contact with material. Wear appropriate breathing apparatus (if applicable) and protective clothing. Stop leak only if safe to do so. Dike and contain land spills; contain water spills by booming. Use water fog to knock down vapours; contain runoff. Absorb residue or small spills with absorbent material and remove to non-leaking containers for disposal. Recommended materials: Clay or Sand Flush area with water to remove trace residue. Dispose of recovered material as noted under Disposal Considerations. Notify appropriate environmental agency(ies).

**7. HANDLING AND STORAGE**

**Handling:** Combustible. Avoid excessive heat, sparks, open flames and all other sources of ignition. Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Empty containers are hazardous, may contain flammable/explosive dusts, residues or vapours. Do not pressurize drum containers to empty them. Wash with soap and water prior to eating, drinking, smoking, applying cosmetics or using toilet facilities. Launder contaminated clothing prior to reuse. Use good personal hygiene.

**Storage:** Store in a cool, dry, well ventilated area, away from heat and ignition sources. Keep container tightly closed.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

THE FOLLOWING INFORMATION, WHILE APPROPRIATE FOR THIS PRODUCT, IS GENERAL IN NATURE. THE SELECTION OF PERSONAL PROTECTIVE EQUIPMENT WILL VARY DEPENDING ON THE CONDITIONS OF USE.

**OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):**

Diesel fuel, as total hydrocarbons (skin): 100 mg/m<sup>3</sup>

Skin Notation: Absorption through skin, eyes and mucous membranes may contribute significantly to the total exposure.

**Mechanical Ventilation:** Concentrations in air should be maintained below the recommended threshold limit value if unprotected personnel are involved. Use explosion-proof ventilation as required to control vapour concentrations. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

**PERSONAL PROTECTIVE EQUIPMENT:**

**Eye Protection:** Chemical safety goggles and/or full face shield to protect eyes and face, if product is handled such that it could be splashed into eyes. Provide an eyewash station in the area.

- Skin Protection:** Impervious gloves (viton, nitrile) should be worn at all times when handling this material. In confined spaces or where the risk of skin exposure is much higher, impervious clothing should be worn. Safety showers should be available for emergency use.
- Respiratory Protection:** If exposure exceeds occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges or use a NIOSH-approved supplied-air respirator. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.

## 9. PHYSICAL DATA

<b>Physical State:</b>	Liquid
<b>Appearance:</b>	Lightly Coloured
<b>Odour:</b>	Hydrocarbon Odour
<b>Odour Threshold:</b>	Not available
<b>Freezing/Pour Point:</b>	Varies with region and season
<b>Boiling Point:</b>	150 - 330 °C
<b>Density:</b>	< 881 kg/m3 @ 15 °C
<b>Vapour Density (Air = 1):</b>	Not available
<b>Vapour Pressure (absolute):</b>	Not available
<b>pH:</b>	Not applicable
<b>Flash Point:</b>	Pensky-Martens CC > 40 °C
<b>Lower Explosion Limit:</b>	1 % (vol.)
<b>Upper Explosion Limit:</b>	6 % (vol.)
<b>Autoignition Temperature:</b>	250 °C
<b>Viscosity:</b>	1.7 - 3.6 cSt @ 40 °C
<b>Evaporation Rate (n-BuAc = 1):</b>	Not available
<b>Partition Coefficient (log K<sub>ow</sub>):</b>	Not available
<b>Water Solubility:</b>	Insoluble
<b>Other Solvents:</b>	Hydrocarbon Solvents
<b>Formula:</b>	C10 to C22 Hydrocarbons

## 10. STABILITY AND REACTIVITY

<b>Chemically Stable:</b>	Yes
<b>Hazardous Polymerization:</b>	No
<b>Sensitive to Mechanical Impact:</b>	No
<b>Sensitive to Static Discharge:</b>	Yes
<b>Hazardous Decomposition Products:</b>	Thermal decomposition products are highly dependent on combustion conditions.
<b>Incompatible Materials:</b>	Avoid strong oxidizing agents.
<b>Conditions of Reactivity:</b>	Avoid excessive heat, open flames and all ignition sources.

## 11. TOXICOLOGICAL INFORMATION

Ingredient (or Product if not specified)	Toxicological Data
Fuels, Diesel, No. 2	LD50 Dermal Rabbit > 5000 mg/kg LD50 Oral Rat = 9000 mg/kg

**Routes of Exposure:** Exposure will most likely occur through skin contact or inhalation.

<b>Irritancy:</b>	This product is expected to be irritating to skin but is not predicted to be a skin sensitizer.
<b>Acute Toxicity:</b>	Vapour concentrations above the recommended exposure level are irritating to the eyes and respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.
<b>Chronic Effects:</b>	Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. Prolonged exposure to high vapour concentration can cause headache, dizziness, nausea, blurred vision and central nervous system depression.
<b>Pre-existing Conditions:</b>	Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.
<b>Carcinogenicity and Mutagenicity:</b>	The International Agency for Research on Cancer (IARC) considers that this product is not classifiable as to its carcinogenicity to humans. Middle distillates have caused skin cancers in laboratory animals when applied repeatedly and left in place between applications. This effect is believed to be caused by the continuous irritation of the skin. Good personal hygiene should be maintained to avoid this risk. The American Conference of Governmental Industrial Hygienists (ACGIH) has classified this product as A3 - confirmed animal carcinogen with unknown relevance to humans.

## 12. ECOLOGICAL INFORMATION

Do not allow product or runoff from fire control to enter storm or sanitary sewers, lakes, rivers, streams, or public waterways. Block off drains and ditches. Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident. Spill area must be cleaned and restored to original condition or to the satisfaction of authorities. May cause physical fouling of aquatic organisms.

<b>Biodegradability:</b>	Not readily biodegradable.
<b>Bioaccumulation:</b>	Potential for bioaccumulation.
<b>Partition Coefficient (log K<sub>ow</sub>):</b>	Not available

### Aquatic Toxicity

May be harmful to aquatic life.

<b>Ingredient:</b>	<b>Toxicological Data</b>
<b>Fuels, Diesel, No. 2</b>	EL50 - growth rate Algae (72hr) 10 - 100 mg/L. EL50 Daphnia Magna (48hr) 10 - 100 mg/L. LL50 (WAF method) Rainbow Trout (96hr) 10 - 100 mg/L.

<b>Definition(s):</b>	LL and EL are the lethal loading concentration and effective loading concentration respectively. The concentration represents the amount of substance added to the system to obtain a toxic concentration. They replace the traditional LC and EC for low solubility substances. WAF is the water accommodated fraction. A slightly soluble hydrocarbon is stirred into water and the insoluble portions are removed. The remaining solution is the water accommodated fraction.
-----------------------	---

## 13. DISPOSAL CONSIDERATIONS

Waste management priorities (depending on volumes and concentration of waste) are: 1. recycle (reprocess), 2. energy recovery (cement kilns, thermal power generation), 3. incineration, 4. disposal at a licenced waste disposal facility. Do not attempt to combust waste on-site. Incinerate at a licenced waste disposal site with approval of environmental authority.

#### 14. TRANSPORTATION INFORMATION

##### Canadian Road and Rail Shipping Classification:

UN Number	UN1202
Proper Shipping Name	DIESEL FUEL
Hazard Class	Class 3 Flammable Liquids
Packing Group	PG III
Additional Information	Not Regulated in Containers Less Than or Equal to 450 Litres.
Shipping Description	DIESEL FUEL Class 3 UN1202 PG III Not Regulated in Containers Less Than or Equal to 450 Litres.

#### 15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Class:	Class B3 Combustible Liquid Class D2B Other Toxic Effects - Skin Irritant
DSL/NDL Status:	This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act. This product and/or all components are listed on the U.S. EPA TSCA Inventory.
Other Regulatory Status:	No Canadian federal standards.

#### 16. ADDITIONAL INFORMATION

##### LABEL STATEMENTS

Hazard Statement :	Combustible Liquid. Irritating to skin.
Handling Statement:	Eliminate all ignition sources. Avoid prolonged exposure to vapours. Wear suitable gloves and eye protection. Bond and ground transfer containers and equipment to avoid static accumulation. Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.
First Aid Statement :	Wash contaminated skin with soap and water. Flush eyes with water. If overcome by vapours remove to fresh air. Do not induce vomiting. Obtain medical attention.

LOW SULPHUR DIESEL FUEL

320-110  
Revision Number: 8

**Revisions:** This MSDS has been reviewed and updated.  
Changes have been made to:  
Section 1  
Section 3  
Section 5  
Section 8  
Section 9  
Section 12  
Section 14

PROPANE

251-300  
Revision Number: 9



## Shell Canada Limited Material Safety Data Sheet

Effective Date: 2006-04-25

Supersedes: 2004-07-07



Class A Compressed  
Gas



Class B1 Flammable  
Gas

### 1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT: **PROPANE**  
SYNONYMS: Dimethylmethane  
PRODUCT USE: Fuel  
MSDS Number: 251-300

**MANUFACTURER**  
**Shell Canada Limited**  
P.O. Box 100, Station M  
400-4th Ave. S.W.  
Calgary, AB Canada  
T2P 2H5

**TELEPHONE NUMBERS**  
**Shell Emergency Number** 1-800-661-7378  
**CANUTEC 24 HOUR EMERGENCY NUMBER** 613-996-6666  
For general information: 1-800-661-1600  
For MSDS information: 403-691-3982  
(From 7:30 to 4:30 Mountain Time) 403-691-2220

This MSDS was prepared by the Toxicology and Product Stewardship Section of Shell Canada Limited.

\*An asterisk in the product name designates a trade-mark(s) of Shell Canada Limited, used under license by Shell Canada Products.

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS Number	% Range	WHMIS Controlled
Propane	74-98-6	> 90	Yes
Propylene	115-07-1	< 5	Yes
Hydrocarbons, C4 and up	68476-44-8	< 2.5	Yes

See Section 8 for Occupational Exposure Guidelines.

### 3. HAZARDS IDENTIFICATION

**Physical Description:** Liquefied Compressed Gas Colourless Odourless

**Routes of Exposure:** Exposure will most likely occur through skin contact or inhalation.

**Hazards:**

This product is not expected to be irritating and has a low level of toxicity under normal use.

Compressed Gas.  
Flammable Gas.  
The gas is an asphyxiant and may also have a mild narcotic effect.  
Direct contact with liquefied gas can result in burns to skin and eyes.  
Product causes suffocation if present at levels that reduce oxygen to below safe breathing levels. While there is no evidence that exposure to industrially acceptable levels of hydrocarbons have produced cardiac effects in humans, animal studies have shown that inhalation of high vapour levels of low molecular weight hydrocarbons has produced cardiac sensitization. Such sensitization may cause fatal changes in heart rhythms.

**Handling:** Eliminate all ignition sources.  
Wear insulated gloves to avoid freezing burns from liquid.  
Wear an approved respirator to prevent overexposure.  
Bond and ground transfer containers and equipment to avoid static accumulation.  
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.

For further information on health effects, see Section 11.

#### 4. FIRST AID

**Eyes:** Flush eyes with water for at least 15 minutes while holding eyelids open. If frostbite or burn occurs, get medical attention.

**Skin:** If victim has received cold burns, treat by immersing in lukewarm water (32 to 43 deg C) for 30-45 minutes. Remove contaminated clothing unless stuck to a burn area in which case cut around it. Obtain medical attention as soon as possible after first aid has been initiated and completed.

**Ingestion:** Not applicable.

**Inhalation:** Remove victim from further exposure and restore breathing, if required. Obtain medical attention.

**Notes to Physician:** Inhalation of product may have a narcotic effect. Assess central nervous system and cardio-respiratory status.

#### 5. FIRE FIGHTING MEASURES

**Extinguishing Media:** Carbon Dioxide  
Dry Chemical  
Water Fog

**Firefighting Instructions:** Extremely flammable. Vapour forms a flammable/explosive mixture with air between upper and lower flammable limits. Evacuate hazard area. Vapours may travel along ground and flashback along vapour trail may occur. Containers exposed to intense heat may rupture. Allow gas to burn if flow cannot be shut off safely. Use water fog to disperse vapours. Fight fire from maximum distance. Do not enter confined fire space without adequate protective clothing and an approved positive pressure self-contained breathing apparatus.

**Hazardous Combustion Products:** Carbon dioxide, carbon monoxide and unidentified organic compounds may be formed upon combustion.

#### 6. ACCIDENTAL RELEASE MEASURES

Issue warning "Flammable". Evacuate personnel not equipped with protective clothing and NIOSH approved respiratory protection. Isolate hazard area and restrict access. Avoid direct contact with material. Stop leak only if safe to do so. Eliminate all ignition sources. Handling equipment must be grounded. Use water fog to knock down vapours; contain runoff.

## 7. HANDLING AND STORAGE

- Handling:** Fixed equipment as well as transfer containers and equipment should be grounded to prevent accumulation of static charge. Vapours may accumulate and travel to distant ignition sources and flashback. Do not cut, drill, grind, weld or perform similar operations on or near containers. Hot surfaces may be sufficient to ignite liquid even in the absence of sparks or flames. Extinguish pilot lights, cigarettes and turn off other sources of ignition prior to use and until all vapours are gone. Vapours are heavier than air and will settle and collect in low areas and pits, displacing breathing air. Natural gas (ethane, propane, or butane) may contain trace amounts of radon gas, a naturally-occurring radioactive material (NORM). Radioactive decay leads to products such as lead-210, which may accumulate in sludge or tank scale and on other equipment surfaces when large volumes of gas are processed. If monitoring shows a radiation level exceeding twice the background level, workers involved in cleaning or maintaining gas-handling equipment should follow appropriate procedures to prevent exposure and protect the environment.
- Storage:** Store in a cool, dry, well ventilated area, away from heat and ignition sources. Protect against physical damage to containers.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

THE FOLLOWING INFORMATION, WHILE APPROPRIATE FOR THIS PRODUCT, IS GENERAL IN NATURE. THE SELECTION OF PERSONAL PROTECTIVE EQUIPMENT WILL VARY DEPENDING ON THE CONDITIONS OF USE.

### OCCUPATIONAL EXPOSURE LIMITS (Current ACGIH TLV/TWA unless otherwise noted):

Aliphatic Hydrocarbon Gases Alkane (C1 - C4): 1000 ppm

- Mechanical Ventilation:** Use explosion-proof ventilation as required to control vapour concentrations. Concentrations in air should be maintained below the recommended threshold limit value if unprotected personnel are involved. Local ventilation recommended where mechanical ventilation is ineffective in controlling airborne concentrations below the recommended occupational exposure limit. Make up air should always be supplied to balance air exhausted (either generally or locally). For personnel entry into confined spaces (i.e. bulk storage tanks) a proper confined space entry procedure must be followed including ventilation and testing of tank atmosphere.

### PERSONAL PROTECTIVE EQUIPMENT:

- Eye Protection:** Chemical safety goggles should be worn. Provide an eyewash station in the area.
- Skin Protection:** Due to cryogenic properties of liquid product wear insulated gloves suitable for low temperatures, and coveralls. Safety showers should be available for emergency use.
- Respiratory Protection:** If exposure has the potential to exceed occupational exposure limits, use an appropriate NIOSH-approved respirator. Use a NIOSH-approved chemical cartridge respirator with organic vapour cartridges or use a NIOSH-approved supplied-air respirator. For high airborne concentrations, use a NIOSH-approved supplied-air respirator, either self-contained or airline breathing apparatus, operated in positive pressure mode.



**9. PHYSICAL DATA**

Physical State:	Liquefied Compressed Gas
Appearance:	Colourless
Odour:	Odourless
Odour Threshold:	Not available
Freezing/Pour Point:	< -188 °C
Boiling Point:	-42 °C
Density:	Not available
Vapour Density (Air = 1):	1.5
Vapour Pressure (absolute):	> 400 mm Hg @ -56 °C
pH:	Not applicable
Flash Point:	Tag Closed Cup -104 °C
Lower Explosion Limit:	2.1 % (vol.)
Upper Explosion Limit:	9.5 % (vol.)
Autoignition Temperature:	432 °C
Viscosity:	Not applicable
Evaporation Rate (n-BuAc = 1):	Not available
Partition Coefficient (log K <sub>ow</sub> ):	2.3
Water Solubility:	Slight
Other Solvents:	Alcohol, Ether
Molecular Weight:	44.1 grams
Formula:	CH <sub>3</sub> CH <sub>2</sub> CH <sub>3</sub>

**10. STABILITY AND REACTIVITY**

Chemically Stable:	Yes
Hazardous Polymerization:	No
Sensitive to Mechanical Impact:	No
Sensitive to Static Discharge:	Yes
Incompatible Materials:	Avoid strong oxidizing agents.
Conditions of Reactivity:	Avoid excessive heat, open flames and all ignition sources. May explode if ignited in an enclosed area.

**11. TOXICOLOGICAL INFORMATION**

Ingredient (or Product if not specified)	Toxicological Data
Propane	LD50 Dermal Rat = 658 mg/kg
Propylene	LC50 Inhalation Rat > 86000 mg/m <sup>3</sup> for 4hours
Hydrocarbons, C4 and up	

Routes of Exposure:	Exposure will most likely occur through skin contact or inhalation.
Acute Toxicity:	This product is not expected to be irritating and has a low level of toxicity under normal use.

**12. ECOLOGICAL INFORMATION**

PROPANE

251-300  
Revision Number: 9

Provincial regulations require and federal regulations may require that environmental and/or other agencies be notified of a spill incident.

**Biodegradability:** Not available.

**Bioaccumulation:** Not available.

**Partition Coefficient (log K<sub>ow</sub>):** 2.3

**Aquatic Toxicity**

Practically non-toxic.

<b>Ingredient:</b>	<b>Toxicological Data</b>
<b>Propane</b>	EL50 - growth rate Algae (72hr) > 100 mg/L. LL50 Rainbow Trout (96hr) > 100 mg/L. EL50 Daphnia Magna (48hr) > 100 mg/L.
<b>Propylene</b>	LL50 Rainbow Trout (96hr) > 100 mg/L.
<b>Hydrocarbons, C4 and up</b>	

**Definition(s):** LL and EL are the lethal loading concentration and effective loading concentration respectively. The concentration represents the amount of substance added to the system to obtain a toxic concentration. They replace the traditional LC and EC for low solubility substances.

### 13. DISPOSAL CONSIDERATIONS

Incinerate at a licenced waste disposal site with approval of environmental authority.

### 14. TRANSPORTATION INFORMATION

**Canadian Road and Rail Shipping Classification:**

UN Number	UN1075
Proper Shipping Name	LIQUEFIED PETROLEUM GAS, NOT ODORIZED
Hazard Class	Class 2.1 Flammable Gases
Shipping Description	LIQUEFIED PETROLEUM GAS, NOT ODORIZED Class 2.1 UN1075

### 15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations (CPR)* and the MSDS contains all the information required by the CPR.

**WHMIS Class:** Class A Compressed Gas  
Class B1 Flammable Gas

**DSL/NDL Status:** This product, or all components, are listed on the Domestic Substances List, as required under the Canadian Environmental Protection Act. This product and/or all components are listed on the U.S. EPA TSCA Inventory.

**Other Regulatory Status:** No Canadian federal standards.

**16. ADDITIONAL INFORMATION****LABEL STATEMENTS**

- Hazard Statement :** Compressed Gas.  
Flammable Gas.  
The gas is an asphyxiant and may also have a mild narcotic effect.  
Direct contact with liquefied gas can result in burns to skin and eyes.
- Handling Statement:** Eliminate all ignition sources.  
Wear insulated gloves to avoid freezing burns from liquid.  
Wear an approved respirator to prevent overexposure.  
Bond and ground transfer containers and equipment to avoid static accumulation.  
Empty containers are hazardous, may contain flammable / explosive dusts, liquid residue or vapours. Keep away from sparks and open flames.
- First Aid Statement :** If overcome by vapours remove to fresh air.  
Treat freezing burns by immersing in lukewarm water.  
Obtain medical attention.
- Revisions:** This MSDS has been reviewed and updated.  
Changes have been made to:  
Section 3  
Section 5  
Section 7  
Section 8  
Section 11