

# MATERIAL SAFETY DATA SHEET

## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT

**Product Name:** HD-5 PROPANE (ODORIZED)  
**Product Description:** Liquefied Hydrocarbon Gas, Gas or Liquefied Gas  
**MSDS Number:** 13603  
**Intended Use:** Fuel gas

### COMPANY IDENTIFICATION

**Supplier:** Imperial Oil Products Division  
111 St. Clair Avenue West  
Toronto, ONT. M5W 1K3 Canada  
**24 Hour Environmental / Health Emergency Telephone:** 519-339-2145  
**Transportation Emergency Phone Number:** 519-339-2145  
**Product Technical Information:** 1-800-268-3183  
**Supplier General Contact:** 1-800-567-3776

## SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

### Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*	Acute Toxicity
ALKANES, C4	68513-65-5	0 - 2.5%	None
Ethane	74-84-0	0 - 5%	None
ISOBUTANE	75-28-5	0 - 2.5%	Inhalation Lethality: LC50 142,500 ppm (Rat)
Propane	74-98-6	90 - 99%	None
Propylene	115-07-1	1 - 5%	None

\* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

### PHYSICAL/CHEMICAL EFFECTS

Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Frostbite hazard - rapidly expanding gas or liquid may cause frostbite. Material can accumulate static charges which may cause an incendiary electrical discharge.

### HEALTH EFFECTS

Continued exposure to odorised gas may reduce or eliminate ability to smell the odorant. People with impaired ability to detect odour due to colds, allergies, injuries etc must be especially cautious. Odour must not be used exclusively as a safety measure. Proper respiratory protection and fire/explosion precautions should be utilised when odour is first detected. Inert gas and/or simple asphyxiant. Reduces oxygen available for breathing. Exposure to concentrations above 10% of the LEL may cause a general central nervous system (CNS) depression typical of anesthetic gases or intoxicants. Aliphatic hydrocarbon gases may build up in confined spaces and may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in narcosis, unconsciousness, and possibly lead to death.

**NFPA Hazard ID:** Health: 1 Flammability: 4 Reactivity: 0  
**HMIS Hazard ID:** Health: 1 Flammability: 4 Reactivity: 0

**Note:** This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

#### SECTION 4 FIRST AID MEASURES

##### INHALATION

Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.

##### SKIN CONTACT

If frostbite occurs, immerse involved area in water at body temperature. Keep immersed for 20 to 40 minutes. Seek medical assistance.

##### EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

##### INGESTION

Not Applicable

#### SECTION 5 FIRE FIGHTING MEASURES

##### EXTINGUISHING MEDIA

**Appropriate Extinguishing Media:** Use water fog, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

**Inappropriate Extinguishing Media:** Straight streams of water

##### FIRE FIGHTING

**Fire Fighting Instructions:** Allow the fire to burn under controlled conditions. Stop leak if you can do so without risk. Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop a leak. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

**Unusual Fire Hazards:** FLAMMABLE GAS. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

**Hazardous Combustion Products:** Oxides of carbon, Incomplete combustion products

#### FLAMMABILITY PROPERTIES

**Flash Point [Method]:** -103°C (-153°F) [ ASTM D-92]  
**Flammable Limits (Approximate volume % in air):** LEL: 2.4 UEL: 9.5  
**Autoignition Temperature:** 432°C (810°F)

## SECTION 6 ACCIDENTAL RELEASE MEASURES

### NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

### PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See Section 3 for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

### SPILL MANAGEMENT

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. CAUTION: When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning. Allow liquid to evaporate from the surface. All equipment used when handling the product must be grounded. Do not direct water at spill or source of leak. Do not touch or walk through spilled material. If possible, turn leaking containers so that gas escapes rather than liquid. Isolate area until gas has dispersed. Prevent spreading of vapour through sewers, ventilation systems and confined areas. Use water spray to reduce vapour or divert vapour cloud drift. Avoid allowing water run-off to contact spilled material.

**Water Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Allow liquid to evaporate from the surface. See Land Spill in the section of the SDS for advice on gases.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

### ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewers, basements or confined areas.

## SECTION 7 HANDLING AND STORAGE

### HANDLING

Use non-sparking tools and explosion-proof equipment. Ethyl mercaptan is added to gas as an odorant to aid in the detection of the gas in case of leak or accidental discharge. Since ethyl mercaptan is reactive, a reduction in its effectiveness may occur during transport and storage of the odorised gas. Therefore, odour must not be used exclusively as a safety measure. Handle gas with strict adherence to established safety procedures. Use proper bonding and/or earthing procedures. Material can accumulate static charges which may cause an electrical spark (ignition source).

**Static Accumulator:** This material is a static accumulator.

### STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be earthed and

bonded.

<b>SECTION 8</b>	<b>EXPOSURE CONTROLS / PERSONAL PROTECTION</b>
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Substance Name	Form	Limit/Standard			Note	Source
Ethane		TWA	1000 ppm			ACGIH
ISOBUTANE		TWA	1000 ppm			ACGIH
Propane		TWA	1000 ppm			ACGIH
Propylene		STEL	3000 ppm			Supplier
Propylene		TWA	1000 ppm			Supplier
Propylene		Limit value not established			Simple asphyxiant.	ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

### ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

### PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

**Respiratory Protection:** If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

**Hand Protection:** Any specific glove information provided is based on published literature and glove manufacturer data. Work conditions can greatly effect glove durability; inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Thermally protective gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.

**Eye Protection:** If contact is likely, safety glasses with side shields are recommended. Face shield is recommended.

**Skin and Body Protection:** Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

No skin protection is ordinarily required under normal conditions of use. In accordance with good industrial hygiene practices, precautions should be taken to avoid skin contact. Thermally protective and chemical resistant apron and long sleeves are recommended when volume of material is significant.

**Specific Hygiene Measures:** Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

## ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

### GENERAL INFORMATION

**Physical State:** Gas  
**Form:** Liquefied  
**Colour:** Colourless  
**Odour:** Mercaptan  
**Odour Threshold:** N/D

### IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

**Relative Density (at 15 °C):** 0.51  
**Flash Point [Method]:** -103°C (-153°F) [ ASTM D-92]  
**Flammable Limits (Approximate volume % in air):** LEL: 2.4 UEL: 9.5  
**Autoignition Temperature:** 432°C (810°F)  
**Boiling Point / Range:** -42°C (-44°F)  
**Vapour Density (Air = 1):** 1.5 at 101 kPa  
**Vapour Pressure:** 850 kPa (6375 mm Hg) at 20°C  
**Evaporation Rate (N-Butyl Acetate = 1):** > 1  
**pH:** N/A  
**Log Pow (n-Octanol/Water Partition Coefficient):** N/A  
**Solubility in Water:** Negligible  
**Viscosity:** N/A  
**Oxidizing properties:** See Sections 3, 15, 16.

### OTHER INFORMATION

**Freezing Point:** N/D  
**Melting Point:** >-187°C (-305°F)

## SECTION 10 STABILITY AND REACTIVITY

**STABILITY:** Material is stable under normal conditions.

**CONDITIONS TO AVOID:** Avoid heat, sparks, open flames and other ignition sources.

**MATERIALS TO AVOID:** Strong oxidizers

**HAZARDOUS DECOMPOSITION PRODUCTS:** Material does not decompose at ambient temperatures.

**HAZARDOUS POLYMERIZATION:** Will not occur.

<b>SECTION 11</b>	<b>TOXICOLOGICAL INFORMATION</b>
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**Acute Toxicity**

Route of Exposure	Conclusion / Remarks
<b>INHALATION</b>	
Toxicity (Rat): LC50 > 5000 mg/m <sup>3</sup>	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Negligible hazard at ambient/normal handling temperatures. Based on assessment of the components.
<b>INGESTION</b>	
Toxicity: No end point data.	Not applicable.
<b>Skin</b>	
Toxicity: No end point data.	Not applicable.
Irritation (Rabbit): Data available.	Negligible irritation to skin at ambient temperatures. Based on test data for structurally similar materials.
<b>Eye</b>	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

**CHRONIC/OTHER EFFECTS**

**For the product itself:**

May cause central nervous system disorder (e.g., narcosis involving a loss of coordination, weakness, fatigue, mental confusion and blurred vision) and/or damage. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite (cold burn). Simple asphyxiant: Acts by displacing oxygen in the lungs thereby diminishing the supply of oxygen available to the blood and tissues. Symptoms include shortness of breath, rapid heart rate, incoordination, lethargy, headaches, nausea, vomiting, and disorientation. Continued lack of oxygen may result in convulsions, loss of consciousness and death. Since exercise increases the tissue need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment. Oxygen in enclosed spaces should be maintained at 21 percent by volume.

Additional information is available by request.

**CMR Status:** None.

Chemical Name	CAS Number	List Citations
Ethane	74-84-0	4
ISOBUTANE	75-28-5	4
Propane	74-98-6	4
Propylene	115-07-1	4

--REGULATORY LISTS SEARCHED--

- |             |               |              |
|-------------|---------------|--------------|
| 1 = IARC 1  | 3 = IARC 2B   | 5 = ACGIH A1 |
| 2 = IARC 2A | 4 = ACGIH ALL | 6 = ACGIH A2 |

<b>SECTION 12</b>	<b>ECOLOGICAL INFORMATION</b>
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The information given is based on data available for the material, the components of the material, and similar materials.

#### ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.

#### MOBILITY

Material -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.

#### PERSISTENCE AND DEGRADABILITY

##### Biodegradation:

Material -- Expected to be inherently biodegradable

##### Atmospheric Oxidation:

Material -- Expected to degrade at a moderate rate in air

#### BIOACCUMULATION POTENTIAL

Material -- Potential to bioaccumulate is low.

### SECTION 13

### DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

#### DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

#### REGULATORY DISPOSAL INFORMATION

**Empty Container Warning** (where applicable): Empty containers may retain residue and can be dangerous. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to refill or clean container since residue is difficult to remove. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

### SECTION 14

### TRANSPORT INFORMATION

#### LAND (TDG)

**Proper Shipping Name:** LIQUEFIED PETROLEUM GASES

**Hazard Class & Division:** 2.1

**UN Number:** 1075

**Packing Group:** (N/A)

#### LAND (DOT)

**Proper Shipping Name:** Petroleum gases, liquified

**Hazard Class & Division:** 2.1

**ID Number:** 1075

**Packing Group:** (N/A)

ERG Number: 115

Label(s): 2.1

Transport Document Name: PETROLEUM GASES, LIQUEFIED, 2.1, UN1075

**SEA (IMDG)**

Proper Shipping Name: Petroleum gases, liquified

Hazard Class & Division: 2.1

EMS Number: F-D, S-U

UN Number: 1075

Packing Group: (N/A)

Label(s): 2.1

Transport Document Name: PETROLEUM GASES, LIQUEFIED, 2.1, UN1075

**AIR (IATA)**

Proper Shipping Name: Petroleum gases, liquified

Hazard Class & Division: 2.1

UN Number: 1075

Packing Group: (N/A)

Label(s): 2.1

Transportation Limitations: CARGO AIRCRAFT ONLY

Transport Document Name: PETROLEUM GASES, LIQUEFIED, 2.1, UN1075

**SECTION 15**

**REGULATORY INFORMATION**

**WHMIS Classification:** Class A: Compressed Gas Class B, Division 1: Flammable Gases

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

**CEPA:** All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

**NATIONAL CHEMICAL INVENTORY LISTING:** AICS, IECSC, DSL, EINECS, ENCS, KECI, PICCS, TSCA

**The Following Ingredients are Cited on the Lists Below:** None.

--REGULATORY LISTS SEARCHED--

1 = TSCA 4

3 = TSCA 5e

5 = TSCA 12b

2 = TSCA 5a2

4 = TSCA 6

6 = NPRI

**SECTION 16**

**OTHER INFORMATION**

N/D = Not determined, N/A = Not applicable

**THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:**

No revision information is available.

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**Precautionary Label Text:**

WHMIS Classification: Class A: Compressed Gas Class B, Division 1: Flammable Gases

### HEALTH HAZARDS

May cause central nervous system depression.

**PHYSICAL HAZARDS** Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Frostbite hazard - rapidly expanding gas or liquid may cause frostbite. Material can accumulate static charges which may cause an incendiary electrical discharge.

### PRECAUTIONS

Use non-sparking tools and explosion-proof equipment. Use proper bonding and/or earthing procedures.

### FIRST AID

**INHALATION:** Immediately remove from further exposure. Get immediate medical assistance. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. Give supplemental oxygen, if available. If breathing has stopped, assist ventilation with a mechanical device.

**Skin:** If frostbite occurs, immerse involved area in water at body temperature. Keep immersed for 20 to 40 minutes. Seek medical assistance.

### FIRE FIGHTING MEDIA

Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

### SPILL/LEAK

**Land Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. **CAUTION:** When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning. Allow liquid to evaporate from the surface. Do not direct water at spill or source of leak. If possible, turn leaking containers so that gas escapes rather than liquid. Isolate area until gas has dispersed. Prevent spreading of vapour through sewers, ventilation systems and confined areas. Use water spray to reduce vapour or divert vapour cloud drift. Avoid allowing water run-off to contact spilled material.

**Water Spill:** Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Allow liquid to evaporate from the surface. Report spills as required to appropriate authorities. See Land Spill in the section of the SDS for advice on gases.

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