

# Safety Data Sheet E-4646

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 03-03-2023 Supersedes: 01-01-2021 Version: 1.0

## **SECTION 1: Identification**

#### 1.1. Product identifier

Product form : Substance

Trade name : Liquefied Petroleum Gas

CAS No : 74-98-6 Formula : C3H8

Other means of identification : Propane, Liquefied Petroleum Gas, n-propane, dimethylmethane, propyl hydride, refrigerant gas

R290

Product group : Core Products

#### 1.2. Recommended use and restrictions on use

Recommended uses and restrictions : Industrial use

Use as directed.

#### 1.3. Supplier

Linde Canada inc. 500 — 5015 Spectrum Way Mississauga - Canada L4W 0E4 T 1-905-803-1600 - F 1-905-803-1682 www.lindecanada.ca

### 1.4. Emergency telephone number

**Emergency number** : 1-800-363-0042

Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents

involving this product.

For routine information, contact your supplier or Linde sales representative.

## **SECTION 2: Hazard identification**

#### 2.1. Classification of the substance or mixture

#### **GHS-CA** classification

Flammable gases, Category 1 H220 Gases under pressure : Liquefied gas H280

Simple Asphyxiant

### 2.2. GHS Label elements, including precautionary statements

# **GHS-CA labelling**

Hazard pictograms



GHS02



GHS04

Signal word : DANGER

Hazard statements : EXTREMELY FLAMMABLE GAS

CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION

MAY CAUSE FROSTBITE.

MAY FORM EXPLOSIVE MIXTURES WITH AIR.

Precautionary statements : Do not handle until all safety precautions have been read and understood

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No

smoking.

LEAKING GAS FIRE: Do not extinguish, unless leak can be stopped safely.

In case of leakage, eliminate all ignition sources

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EN (English - CA) SDS ID : E-4646 1/9



### Safety Data Sheet E-4646

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 03-03-2023 Supersedes: 01-01-2021 Version: 1.0

Use and store only outdoors or in a well-ventilated place.

Use a back flow preventive device in the piping.
Use only with equipment rated for cylinder pressure.

Never put cylinders into unventilated areas of passenger vehicles.

Close valve after each use and when empty.

Protect from sunlight when ambient temperature exceeds 52°C (125°F).

#### 2.3. Other hazards

Other hazards which do not result in classification

: Contact with liquid may cause cold burns/frostbite.

#### 2.4. Unknown acute toxicity (GHS CA)

Not applicable

# **SECTION 3: Composition/information on ingredients**

#### 3.1. Substances

Name	CAS No.	% (Vol.)	Common Name (synonyms)
Propane (Main constituent)	(CAS No) 74-98-6	100	Normal propane / PROPANE / n-Propane

#### 3.2. Mixtures

Not applicable

## **SECTION 4: First-aid measures**

#### 4.1. Description of first aid measures

First-aid measures after inhalation

: Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact

: The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact

Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately. Get immediate medical attention. Immediately flush eyes thoroughly with water for at least 15 minutes.

First-aid measures after ingestion

: Ingestion is not considered a potential route of exposure.

#### 4.2. Most important symptoms and effects (acute and delayed)

Symptoms/injuries : No additional information available Most Important Symptoms/Effects : Asphyxiant in high concentrations.

## 4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : None.

### SECTION 5: Fire-fighting measures

### 5.1. Suitable extinguishing media

Suitable extinguishing media

: Carbon dioxide. Dry chemical. Water spray. Foam. Carbon dioxide, Dry chemical, Water spray or fog. Use extinguishing media appropriate for surrounding fire.

# 5.2. Unsuitable extinguishing media

No additional information available

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EN (English - CA) SDS ID : E-4646 2/9



# Safety Data Sheet E-4646

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 03-03-2023 Version: 1.0 Supersedes: 01-01-2021

#### 5.3 Specific hazards arising from the hazardous product

: EXTREMELY FLAMMABLE GAS. If venting or leaking gas catches fire, do not extinguish Fire hazard

flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area,

check the atmosphere with an appropriate device.

Explosion hazard EXTREMELY FLAMMABLE GAS. Forms explosive mixtures with air and oxidizing agents.

Reactivity No reactivity hazard other than the effects described in sub-sections below. : No reactivity hazard other than the effects described in sub-sections below. Reactivity in case of fire

#### Special protective equipment and precautions for fire-fighters

Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop

flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.

Protection during firefighting Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen. DANGER! FLAMMABLE,

HIGH PRESSURE GAS..

Special protective equipment for fire fighters Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire

Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat Specific methods radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and

drainage systems.

Stop flow of product if safe to do so.

Use water spray or fog to knock down fire fumes if possible.

Other information Containers are equipped with a pressure relief device. (Exceptions may exist where

authorized.).

# **SECTION 6: Accidental release measures**

### Personal precautions, protective equipment and emergency procedures

General measures

: Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Evacuate area. Ensure adequate air ventilation. Stop leak if safe to do so. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.

Personal Precautions, Protective Equipment and Emergency Procedures

: General measures : Ensure adequate ventilation. Personal Precautions, Protective Equipment and Emergency Procedures: EVACUATE ALL PERSONNEL FROM AFFECTED AREA. Use appropriate protective equipment. If leak is on user's equipment, be certain to purge piping before attempting repairs. If leak is on a container or container valve contact the closest Linde Canada location.

### Methods and materials for containment and cleaning up

For containment : Try to stop release if safe to do so.

Methods for cleaning up : Dispose of contents/container in accordance with local/regional/national/international

regulations. Contact supplier for any special requirements.

SDS ID: E-4646 EN (English - CA) 3/9



# Safety Data Sheet E-4646

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 03-03-2023 Supersedes: 01-01-2021 Version: 1.0

### **SECTION 7: Handling and storage**

#### 7.1. Precautions for safe handling

Precautions for safe handling

: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment.

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

#### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

Store only where temperature will not exceed 52 °C (125 °F). Post "No Smoking/No Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g.: CSA, TSSA, or NFPA Codes), or according to the provincial requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 52 °C (125 °F). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

Store only where temperature will not exceed 52 °C (125 °F). Post "No Smoking/No Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g.: CSA, TSSA, or NFPA Codes), or according to the provincial requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16.

## **SECTION 8: Exposure controls/personal protection**

#### 8.1. Control parameters

Propane (74-98-6)		
USA - OSHA	OSHA PEL TWA [1]	1800 mg/m³
USA - OSHA	OSHA PEL TWA [2]	1000 ppm
Canada (Quebec)	VEMP (OEL TWA)	1800 mg/m³
Canada (Quebec)	VEMP (OEL TWA) [ppm]	1000 ppm
Alberta	OEL TWA [ppm]	1000 ppm

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EN (English - CA) SDS ID : E-4646 4/9



# Safety Data Sheet E-4646

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 03-03-2023 Supersedes: 01-01-2021 Version: 1.0

Propane (74-98-6)			
Nunavut	OEL STEL [ppm]	1250 ppm	
Nunavut	OEL TWA [ppm]	1000 ppm	
Northwest Territories	OEL STEL [ppm]	1250 ppm	
Northwest Territories	OEL TWA [ppm]	1000 ppm	
Québec	VEMP (OEL TWA)	1800 mg/m³	
Québec	VEMP (OEL TWA) [ppm]	1000 ppm	
Saskatchewan	OEL STEL [ppm]	1250 ppm	
Saskatchewan	OEL TWA [ppm]	1000 ppm	

### 8.2. Appropriate engineering controls

Appropriate engineering controls

: An explosion-proof local exhaust system or a mechanical system is acceptable if it can prevent oxygen deficiency and keep hazardous fumes and gases below all applicable exposure limits in the worker's breathing area. During welding, ensure that there is adequate ventilation to keep worker exposure below applicable limits for fumes, gases, and other by-products of welding. Do not breathe fumes or gases. Short-term overexposure to fumes may cause dizziness, nausea, and dryness or irritation of the nose, throat, and eyes, or may cause other similar discomfort. Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. MECHANICAL (GENERAL): Inadequate - Use only in a closed system. Use explosion proof equipment and lighting. Provide adequate general and local exhaust ventilation. Ensure exposure is below occupational exposure limits (where available).

#### 8.3. Individual protection measures/Personal protective equipment

Personal protective equipment

: Safety glasses. Face shield. Gloves.







Hand protection

: Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection

Wear safety glasses with side shields. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines. Safety eye wear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Skin and body protection

: As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing.

Respiratory protection

: Respiratory protection: Use air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below OEL (if applicable). Select in accordance with provincial regulations, local bylaws or guidelines. Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection

: Wear cold insulating gloves when transfilling or breaking transfer connections.

Environmental exposure controls

: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

Other information

: Other protection: Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

### **SECTION 9: Physical and chemical properties**

# 9.1. Information on basic physical and chemical properties

(a) Physical state : Gas
(b) Colour : Colourless.

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EN (English - CA) SDS ID : E-4646 5/9



# Safety Data Sheet E-4646

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 03-03-2023 Supersedes: 01-01-2021 Version: 1.0

(c) Odour : Poor warning properties at low concentrations. Stenchant often added. Sweetish.

Odour threshold : No data available

(d) Melting point : No data available

Freezing point : -187.69 °C (-305.8°F)

(e) Boiling point : -42.1 °C (-44.32°F)

(f) Flammability : Flammable

(f) Flammability : Flammable (g) Flammability (solid, gas) : 2.1 – 9.5 vol %

(h) Flash point : -104.4 °C (-155.2°F) TCC

(i) Auto-ignition temperature : 450 °C (842°F)
(j) Decomposition temperature : No data available
(k) pH : Not applicable.
(l) Viscosity, kinematic : Not applicable.
(m) Solubility : Water: 75 mg/l

(n) Partition coefficient – n-octanol/water [log

Pow/log Kow]

(o) Vapour pressure

: 8.58 bar (109.73 psig)

: 2.36

(p) Density : 0.506 – 0.583 g/cm³ (at 15 °C)

Relative gas density : 1.5

(r) Particle characteristics : No data available

(s) Molecular mass : 44 g/mol (t) Critical temperature : 96.8 °C (206°F)

(v) Oxidizing properties : None.

(w) Relative evaporation rate (butylacetate=1): No data availableRelative evaporation rate (ether=1): Not applicable.

#### 9.2. Other information

Gas group : Liquefied gas

Additional information : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below

ground level.

### **SECTION 10: Stability and reactivity**

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : Can form explosive mixture with air. May react violently with oxidants.

Conditions to avoid : Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

Incompatible materials : Air, Oxidizer. Chlorine dioxide.

Hazardous decomposition products : Thermal decomposition or burning may produce carbon monoxide, carbon dioxide, and

hydrogen. The welding and cutting process may form reaction products such as carbon monoxide and carbon dioxide. Other decomposition products of normal operation originate

from the volatilization, reaction, or oxidation of the material being worked.

# **SECTION 11: Toxicological information**

11.1 Likely routes of exposure : Inhalation

11.2 Symptoms related to the physical, chemical, and toxicological characteristics

: No additional information available

# 11.3 Delayed and immediate effects and

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EN (English - CA) SDS ID : E-4646 6/9



# Safety Data Sheet E-4646

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 03-03-2023 Supersedes: 01-01-2021 Version: 1.0

#### chronic effects

: Not classified Acute toxicity (oral) Acute toxicity (dermal) : Not classified Acute toxicity (inhalation) : Not classified Skin corrosion/irritation : Not classified

pH: Not applicable.

Serious eye damage/irritation : Not classified

pH: Not applicable.

Respiratory or skin sensitization : Not classified Germ cell mutagenicity : Not classified Carcinogenicity : Not classified Reproductive toxicity : Not classified Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated

exposure)

: Not classified

Aspiration hazard

: Not classified

### 11.4 Toxicity

Propane ( \f )74-98-6	
LC50 inhalation rat (ppm)	> 800000 ppm (Exposure time: 15 min)

Propane (74-98-6)	
Hydrocarbon	Yes

# **SECTION 12: Ecological information**

#### 12.1. **Toxicity**

Ecology - general : No ecological damage caused by this product.

#### 12.2. Persistence and degradability

Propane (74-98-6)	
Persistence and degradability	The substance is biodegradable. Unlikely to persist.

#### 12.3. **Bioaccumulative potential**

Propane (74-98-6)	
Log Pow	2.36
Log Kow	Not applicable.
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

#### 12.4. Mobility in soil

Propane (74-98-6)	
Mobility in soil	No data available.
Log Pow	2.36
Log Kow	Not applicable.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

### Other adverse effects

: None. Effect on the ozone layer

Effect on global warming : No known effects from this product.

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SDS ID: E-4646 EN (English - CA) 7/9



# Safety Data Sheet E-4646

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 03-03-2023 Supersedes: 01-01-2021 Version: 1.0

### **SECTION 13: Disposal considerations**

Product/Packaging disposal recommendations

Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

### **SECTION 14: Transport information**

### 14.1. Basic shipping description

In accordance with TDG

**TDG** 

UN-No. (TDG) : UN1978

TDG Primary Hazard Classes : 2.1 - Class 2.1 - Flammable Gases

Proper shipping name : PROPANE

ERAP Index : 3 000
Explosive Limit and Limited Quantity Index : 0.125 L
Passenger Carrying Ship Index : 110 kg
Passenger Carrying Road Vehicle or Passenger : Forbidden

Carrying Railway Vehicle Index

### 14.2. Air and sea transport

#### **IMDG**

UN-No. (IMDG) : 1978
Proper Shipping Name (IMDG) : PROPANE
Class (IMDG) : 2 - Gases
MFAG-No : 115

IATA

UN-No. (IATA) : 1978
Proper Shipping Name (IATA) : PROPANE
Class (IATA) : 2 - Gases

# **SECTION 15: Regulatory information**

# 15.1. National regulations

# Propane (74-98-6)

Listed on the Canadian DSL (Domestic Substances List)

### 15.2. International regulations

#### Propane (74-98-6)

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory

Listed on the Japanese ISHL (Industrial Safety and Health Law)

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Listed on INSQ (Mexican National Inventory of Chemical Substances)

#### **SECTION 16: Other information**

 Date of issue
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 Revision date
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Indication of changes:

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EN (English - CA) SDS ID : E-4646 8/9



# Safety Data Sheet E-4646

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 03-03-2023 Supersedes: 01-01-2021 Version: 1.0

Training advice

Other information

: The hazard of asphyxiation is often overlooked and must be stressed during operator training. Ensure operators understand the flammability hazard.

: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde Canada asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Linde Canada Inc, SDSs are furnished on sale or delivery by Linde Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Linde sales representative, local distributor, or supplier, or download from www.lindecanada.ca.

NFPA health hazard

NFPA fire hazard

NFPA instability

 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health

Flammability

Physical

: 1 Slight Hazard - Irritation or minor reversible injury possible

: 4 Severe Hazard - Flammable gases, or very volatile flammable liquids with flash points below 73 F, and boiling points below 100 F. Materials may ignite spontaneously with air. (Class IA)

: 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.

SDS Canada (GHS) - Linde NEW

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

EN (English - CA) SDS ID : E-4646 9/9