SAFETY DATA SHEET



Methane, Refrigerated Liquid

Section 1. Identification

GHS product identifier	: Methane, Refrigerated Liquid
Chemical name	: methane
Other means of identification	: Methane, Refrigerated Liquid (Cryogenic Liquid) or Natural Gas, refrigerated Liquid (Cryogenic Liquid), with high methane content D.O.T.), R 50; Biogas; R 50 (refrigerant)
Product use	: Synthetic/Analytical chemistry.
Synonym	: Methane, Refrigerated Liquid (Cryogenic Liquid) or Natural Gas, refrigerated Liquid (Cryogenic Liquid), with high methane content D.O.T.), R 50; Biogas; R 50 (refrigerant)
SDS #	: 001186
Supplier's details	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Emergency telephone number (with hours of operation)	: 1-866-734-3438

Section 2. Hazards identification

OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the	: FLAMMABLE GASES - Category 1
substance or mixture	GASES UNDER PRESSURE - Refrigerated liquefied gas
GHS label elements	
Hazard pictograms	
Signal word	: Danger
Hazard statements	: Extremely flammable gas.
	May form explosive mixtures with air.
	Contains refrigerated gas; may cause cryogenic burns or injury.
	May cause frostbite.
	May displace oxygen and cause rapid suffocation.
Precautionary statements	
General	: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Do not change or force fit connections. Avoid spills. Do not walk or roll equipment over spills. Approach suspected leak area with caution.
Prevention	: Never Put cylinders into unventilated areas of passenger vehicles. Wear cold insulating gloves and face shield. Keep away from heat, sparks, open flames and hot surfaces No smoking. Use and store only outdoors or in a well ventilated place.
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Section 2. Hazards identification

Response: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical attention. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.Storage: Store in a well-ventilated place.Disposal: Not applicable.Hazards not otherwise classified: Liquid can cause burns similar to frostbite.		
medical attention.Leaking gas fire: Do not extinguish, unless leak can be stopped safely.Storage: Store in a well-ventilated place.		: Liquid can cause burns similar to frostbite.
medical attention. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.	Disposal	: Not applicable.
medical attention. Leaking gas fire: Do not extinguish, unless leak can be stopped	Storage	: Store in a well-ventilated place.
	Response	medical attention. Leaking gas fire: Do not extinguish, unless leak can be stopped

Section 3. Composition/information on ingredients

Substance/mixture	: Substance
Chemical name	: methane
Other means of identification	: Methane, Refrigerated Liquid (Cryogenic Liquid) or Natural Gas, refrigerated Liquid (Cryogenic Liquid), with high methane content D.O.T.), R 50; Biogas; R 50 (refrigerant)

CAS number/other identifiers

CAS number	: 74-82-8
Product code	: 001186

Ingredient name	%	CAS number
methane	100	74-82-8

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary firs	<u>t aid measures</u>
Eye contact	: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention if irritation occurs.
Inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Skin contact	: Wash contaminated skin with soap and water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Get medical attention if symptoms occur. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if adverse health effects persist or are severe. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

Most important symptoms/effects, acute and delayed

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Section 4. First aid measures

Potential acute health effe	<u>cts</u>
Eye contact	: Extremely cold material. Liquid can cause burns similar to frostbite.
Inhalation	: No known significant effects or critical hazards.
Skin contact	 Extremely cold material. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
Frostbite	: Try to warm up the frozen tissues and seek medical attention.
Ingestion	: Ingestion of liquid can cause burns similar to frostbite.
Over-exposure signs/sym	<u>ptoms</u>
Eye contact	: Adverse symptoms may include the following: frostbite
Inhalation	: No specific data.
Skin contact	: Adverse symptoms may include the following: frostbite
Ingestion	: Adverse symptoms may include the following: frostbite
Indication of immediate me	dical attention and special treatment needed, if necessary
Notes to physician	 Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: No specific treatment.
Protection of first-aiders	: No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media	
Suitable extinguishing media	: Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: None known.
Specific hazards arising from the chemical	: Contains gas under pressure. Contains refrigerated gas. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.
Hazardous thermal decomposition products	: Decomposition products may include the following materials: carbon dioxide carbon monoxide
Special protective actions for fire-fighters	: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.
Special protective equipment for fire-fighters	: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.
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Section 6. Accidental release measures

Personal precautions, protec	tiv	e equipment and emergency procedures
For non-emergency personnel	:	Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	:	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	:	Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Methods and materials for co	nt	ainment and cleaning up
Small spill	:	Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof

Small spill	Immediately contact emergency personnel. Stop leak if without risk. Use tools and explosion-proof equipment.	e spark-proof
Large spill	Immediately contact emergency personnel. Stop leak if without risk. Use tools and explosion-proof equipment. Note: see Section 1 for emergency information and Section 13 for waste disposal.	

Section 7. Handling and storage

Precautions for safe handling

Protective measures	Put on appropriate personal protective equipment (see Section 8). Contains gas un pressure. Contains refrigerated gas. Do not get in eyes or on skin or clothing. Avo breathing gas. Use only with adequate ventilation. Wear appropriate respirator whe ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any oth ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suita hand truck for cylinder movement. Never allow any unprotected part of the body to touch uninsulated pipes or vessels contain cryogenic liquids. Prevent entrapment of liquid in closed systems or piping without pressure relief devices. Some materials may become brittle at low temperatian will easily fracture.					
Advice on general occupational hygiene	: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.					
Conditions for safe storage, including any incompatibilities	: Store in accordance with local regulations. Store in a segregated and approved area. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).					
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Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name		Exposure limits					
methane		ACGIH TLV (United States, 3/2012). TWA: 1000 ppm 8 hours.					
Appropriate engineering controls	other engineering controls to keep worker recommended or statutory limits. The end	process enclosures, local exhaust ventilation or er exposure to airborne contaminants below any ngineering controls also need to keep gas, ower explosive limits. Use explosion-proof					
Environmental exposure controls	they comply with the requirements of envice cases, fume scrubbers, filters or engineer	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.					
Individual protection measu	<u>res</u>						
Hygiene measures	eating, smoking and using the lavatory a Appropriate techniques should be used t	to remove potentially contaminated clothing. sing. Ensure that eyewash stations and safety					
Eye/face protection	gases or dusts. If contact is possible, th	ved standard should be used when a risk o avoid exposure to liquid splashes, mists, e following protection should be worn, unless ee of protection: safety glasses with side-					
Skin protection							
Hand protection	worn at all times when handling chemica necessary. If contact with the liquid is por temperatures should be worn. Consider manufacturer, check during use that the properties. It should be noted that the tim be different for different glove manufacture	ing the parameters specified by the glove					
Body protection	performed and the risks involved and sh handling this product. When there is a right structure is a right structure with the structure is a right structure with the structure s	isk of ignition from static electricity, wear anti- st protection from static discharges, clothing					
Other skin protection		skin protection measures should be selected the risks involved and should be approved by a					
Respiratory protection		ed respirator complying with an approved his is necessary. Respirator selection must be levels, the hazards of the product and the safe					

Section 9. Physical and chemical properties

<u>Appearance</u>						
Physical state	: Gas. [Refrigerated liquefied gas]					
Color	: Colorless.					
Molecular weight	16.05 g/mole					
Molecular formula	: C-H4					
Boiling/condensation point	: -161.48°C (-258.7°F)					
Melting/freezing point	: -187.6°C (-305.7°F)					
Critical temperature	: -82.45°C (-116.4°F)					
Odor	: Odorless.					
Odor threshold	: Not available.					
рН	: Not available.					
Flash point	: Closed cup: -104°C (-155.2°F)					
Burning time	: Not applicable.					
Burning rate	: Not applicable.					
Evaporation rate	: Not available.					
Flammability (solid, gas)	: Extremely flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and oxidizing materials.					
Lower and upper explosive (flammable) limits	: Lower: 1.8% Upper: 8.4%					
Vapor pressure	: Not available.					
Vapor density	: 0.55 (Air = 1) Liquid Density@BP: 26.5 lb/ft3 (424.5 kg/m3)					
Specific Volume (ft ³ /lb)	: 2.3641					
Gas Density (Ib/ft ³)	: 0.423 (25°C / 77 to °F)					
Relative density	: Not applicable.					
Solubility	: Not available.					
Solubility in water	: 0.0244 g/l					
Partition coefficient: n- octanol/water	: 1.09					
Auto-ignition temperature	: 287°C (548.6°F)					
Decomposition temperature	: Not available.					
SADT	: Not available.					
Viscosity	: Not applicable.					

Section 10. Stability and reactivity

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Incompatibility with various substances	: Extremely reactive or incompatible with the following materials: oxidizing materials.						
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.						
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.						
Chemical stability	The product is stable.						
Reactivity	: No specific test data related to reactivity available for this product or its ingredients.						

Section 10. Stability and reactivity

Hazardous decomposition products

: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure) Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure	: Not available.
Potential acute health effect	<u>ts</u>
Eye contact	: Extremely cold material. Liquid can cause burns similar to frostbite.
Inhalation	: No known significant effects or critical hazards.
Skin contact	: Extremely cold material. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
Ingestion	: Ingestion of liquid can cause burns similar to frostbite.
Symptoms related to the pl	nysical, chemical and toxicological characteristics
Eye contact	: Adverse symptoms may include the following: frostbite
Inhalation	: No specific data.
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Section 11. Toxicological information

Skin contact	: Adverse symptoms may include the following: frostbite
Ingestion	: Adverse symptoms may include the following: frostbite
Delayed and immediate effe	cts and also chronic effects from short and long term exposure
Short term exposure	
Potential immediate effects	: Not available.
Potential delayed effects	: Not available.
Long term exposure	
Potential immediate effects	: Not available.
Potential delayed effects	: Not available.
Potential chronic health eff	fects
Not available.	
General	: No known significant effects or critical hazards.
Carcinogenicity	: No known significant effects or critical hazards.
Mutagenicity	: No known significant effects or critical hazards.
Teratogenicity	: No known significant effects or critical hazards.
Developmental effects	: No known significant effects or critical hazards.
Fertility effects	: No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Not available.

Section 12. Ecological information

Toxicity

Not available.

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
methane	1.09	-	low

Mobility in soil

Soil/water partition coefficient (Koc)	: Not available.

Other adverse effects : No known significant effects or critical hazards.

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Section 13. Disposal considerations

Disposal methods

: The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

Section 14. Transport information

	DOT	TDG	Mexico	IMDG	ΙΑΤΑ
UN number	UN1972	UN1972	UN1972	UN1972	UN1972
UN proper shipping name	Methane, Refrigerated Liquid	Methane, Refrigerated Liquid	Methane, Refrigerated Liquid	Methane, Refrigerated Liquid	Methane, Refrigerated Liquid
Transport hazard class(es)	2.1	2.1	2.1	2.1	2.1
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	-	Explosive Limit and Limited Quantity Index 0.125 ERAP Index 3000 Passenger Carrying Ship Index Forbidden Passenger Carrying Road or Rail Index Forbidden	-	-	Passenger and Cargo <u>Aircraft</u> Quantity limitation: 0 Forbidden <u>Cargo Aircraft Only</u> Quantity limitation: 150 kg

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Special precautions for user : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according : Not available. to Annex II of MARPOL 73/78 and the IBC Code

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Section 15. Regulatory information

U.S. Federal regulations	: TSCA	8(a) CDR Exei	mpt/Parti	al exemption	: Not determir	ned	
	United	States invent	tory (TSC	CA 8b) : This m	aterial is listed	d or exempted.	
	Clean	Air Act (CAA)	112 regu	lated flamma	ble substanc	es: methane	
Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)	: Not list	ed					
Clean Air Act Section 602 Class I Substances	: Not list	ed					
Clean Air Act Section 602 Class II Substances	: Not list	ed					
DEA List I Chemicals (Precursor Chemicals)	: Not list	ed					
DEA List II Chemicals (Essential Chemicals)	: Not list	ed					
<u>SARA 302/304</u>							
Composition/information	on ingredie	ents					
No products were found.							
SARA 304 RQ	: Not ap	plicable.					
<u>SARA 311/312</u>							
Classification	: Fire ha Suddei	zard n release of pro	essure				
Composition/information	on ingredie	ents					
Name		%	Fire	Sudden	Reactive	Immediate	Delayed

Name		hazard	Sudden release of pressure		(acute) health	Delayed (chronic) health hazard
methane	100	Yes.	Yes.	No.	No.	No.

State regulations

State regulations		
Massachusetts	1	This material is listed.
New York	:	This material is not listed.
New Jersey	:	This material is listed.
Pennsylvania	:	This material is listed.
Canada inventory	:	This material is listed or exempted.
International regulations		
International lists : Au Ch Ja Ko Ma Ne Ph		Australia inventory (AICS): This material is listed or exempted. China inventory (IECSC): This material is listed or exempted. Japan inventory: This material is listed or exempted. Korea inventory: This material is listed or exempted. Malaysia Inventory (EHS Register): Not determined. New Zealand Inventory of Chemicals (NZIoC): This material is listed or exempted. Philippines inventory (PICCS): This material is listed or exempted. Taiwan inventory (CSNN): Not determined.
Chemical Weapons Convention List Schedule I Chemicals	:	Not listed

Section 15. Regulatory information

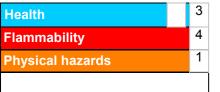
<u>Canada</u>

- WHMIS (Canada)
- Class A: Compressed gas. Class B-1: Flammable gas.
 CEPA Toxic substances: This material is listed.
 Canadian ARET: This material is not listed.
 Canadian NPRI: This material is listed.
 Alberta Designated Substances: This material is not listed.
 Ontario Designated Substances: This material is not listed.
 Quebec Designated Substances: This material is not listed.

Section 16. Other information

Canada Label requirements	: Class A: Compressed gas.
	Class B-1: Flammable gas.

Hazardous Material Information System (U.S.A.)



Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910. 1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

<u>History</u>						
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Date of issue/Date of revision	: 5/20/2015.					
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Section 16. Other information

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Version	: 0.04
Key to abbreviations	 ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United NationsACGIH – American Conference of Governmental Industrial Hygienists AIHA – American Industrial Hygiene Association CAS – Chemical Abstract Services CEPA – Canadian Environmental Protection Act CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA) CFR – United States Code of Federal Regulations CPR – Controlled Products Regulations DSL – Domestic Substances List GWP – Global Warming Potential IARC – International Civil Aviation Organisation Inh – Inhalation LC – Lethal concentration LD – Lethal dosage NDSL – Non-Domestic Substances List NIOSH – National Institute for Occupational Safety and Health TDG – Canadian Transportation of Dangerous Goods Act and Regulations TLV – Threshold Limit Value TSCA – Toxic Substances Control Act WEEL – Workplace Environmental Exposure Level WHMIS – Canadian Workplace Hazardous Material Information System
Indicates information the	t has changed from previously issued version.
Notice to reader	

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

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