SAFETY DATA SHEET

N-Butane

Section 1. Identification

GHS product identifier	: N-Butane
Chemical name	: Butane
Other means of identification	 n-Butane; Diethyl; Freon 600; Liquefied petroleum gas; LPG; n-C4H10; Butanen; Butani; Methylethylmethane; UN 1011; UN 1075; A-17; Bu-Gas.
Product use	: Synthetic/Analytical chemistry.
Synonym	 n-Butane; Diethyl; Freon 600; Liquefied petroleum gas; LPG; n-C4H10; Butanen; Butani; Methylethylmethane; UN 1011; UN 1075; A-17; Bu-Gas.
SDS #	: 001007
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 - Liquefied gas				
GHS label elements					
Hazard pictograms					
Signal word	: Danger				
Hazard statements	: Extremely flammable gas.				
	May form explosive mixtures with air.				
	Contains gas under pressure; may explode if heated.				
	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. Approach suspected leak area with caution.				
Prevention	: Never Put cylinders into unventilated areas of passenger vehicles. Keep away from heat, sparks, open flames and hot surfaces No smoking. Use and store only outdoors or in a well ventilated place.				
Response	: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.				
Date of issue/Date of revision	: 5/7/2015. Date of previous issue : 10/15/2014. Version : 0.03 1/1.				



Section 2. Hazards identification

Storage	: Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.
Disposal	: Not applicable.

Hazards not otherwise classified

: Liquid can cause burns similar to frostbite.

Section 3. Composition/information on ingredients

Substance/mixture	: Substance
Chemical name	: Butane
Other means of identification	: n-Butane; Diethyl; Freon 600; Liquefied petroleum gas; LPG; n-C4H10; Butanen; Butani; Methylethylmethane; UN 1011; UN 1075; A-17; Bu-Gas.

CAS number/other identifiers

CAS number	: 106-97-8		
Product code	: 001007		
Ingredient name		%	CAS number
Butane		100	106-97-8

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 first aid measures

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	: Flush contaminated skin with plenty of 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 Potential acute health effects

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Section 4. First aid measures

Eve contact	Liquid can cause hume similar to frosthite
Eye contact	: Liquid can cause burns similar to frostbite.
Inhalation	: No known significant effects or critical hazards.
Skin contact	 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/symp	<u>otoms</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. 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. The vapor/gas is heavier than air and will spread along the ground. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or 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, protect	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	nta	ainment and cleaning up
Small spill	:	Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact 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 und pressure. Do not get in eyes or on skin or clothing. Avoid breathing gas. Use only v adequate ventilation. Wear appropriate respirator when ventilation is inadequate. D not enter storage areas and confined spaces unless adequately ventilated. Store an use away from heat, sparks, open flame or any other 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 puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do n drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.	vith o d - not
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 bef 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 away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Keep contain 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).	ner

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Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name		Exposure limits
Butane		ACGIH TLV (United States, 3/2012). TWA: 1000 ppm 8 hours. NIOSH REL (United States, 1/2013). TWA: 1900 mg/m ³ 10 hours. TWA: 800 ppm 10 hours. OSHA PEL 1989 (United States, 3/1989). TWA: 1900 mg/m ³ 8 hours. TWA: 800 ppm 8 hours.
Appropriate engineering controls	other engineering controls to keep w recommended or statutory limits.	Use process enclosures, local exhaust ventilation or vorker exposure to airborne contaminants below any he engineering controls also need to keep gas, any lower explosive limits. Use explosion-proof
Environmental exposure controls	they comply with the requirements o	process equipment should be checked to ensure of environmental protection legislation. In some gineering modifications to the process equipment ns to acceptable levels.
Individual protection meas	ures	
Hygiene measures	eating, smoking and using the lavate Appropriate techniques should be us	broughly after handling chemical products, before bry and at the end of the working period. sed to remove potentially contaminated clothing. reusing. Ensure that eyewash stations and safety in location.
Eye/face protection	assessment indicates this is necess gases or dusts. If contact is possibl	pproved standard should be used when a risk ary to avoid exposure to liquid splashes, mists, e, the following protection should be worn, unless legree of protection: safety glasses with side-
Skin protection		
Hand protection	worn at all times when handling che necessary. If contact with the liquid temperatures should be worn. Cons manufacturer, check during use that properties. It should be noted that the be different for different glove manu	es complying with an approved standard should be mical products if a risk assessment indicates this is is possible, insulated gloves suitable for low sidering the parameters specified by the glove t the gloves are still retaining their protective he time to breakthrough for any glove material may facturers. In the case of mixtures, consisting of ime of the gloves cannot be accurately estimated.
Body protection	performed and the risks involved an handling this product. When there is	ne body should be selected based on the task being d should be approved by a specialist before s a risk of ignition from static electricity, wear anti- eatest protection from static discharges, clothing oots and gloves.
Other skin protection	: Appropriate footwear and any addition	onal skin protection measures should be selected

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

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Section 8. Exposure controls/personal protection

Respiratory protection

: Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Appearance		
Physical state	1	Gas. [Liquefied compressed gas.]
Color	:	Colorless.
Molecular weight	1	58.14 g/mole
Molecular formula	1	C4-H10
Boiling/condensation point	1	-0.5°C (31.1°F)
Melting/freezing point	1	-138°C (-216.4°F)
Critical temperature	1	151.85°C (305.3°F)
Odor	:	Odorless.
Odor threshold	:	Not available.
рН	:	Not available.
Flash point	:	Closed cup: -60°C (-76°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	:	16.3 (psig)
Vapor density	:	2.1 (Air = 1)
Specific Volume (ft ³ /lb)	1	6.435
Gas Density (lb/ft ³)	:	0.1554
Relative density	1	Not applicable.
Solubility	1	Not available.
Solubility in water	:	0.061 g/l
Partition coefficient: n- octanol/water	:	2.89
Auto-ignition temperature	:	365°C (689°F)
Decomposition temperature	:	Not available.
SADT	:	Not available.
Viscosity		Not applicable.

Section 10. Stability and reactivity

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Possibility of hazardous reactions	: Under norr	nal conditions of storage a	and use, hazardous r	eactions will not occur.	
Chemical stability	: The produc	ct is stable.			
Reactivity	: No specific	c test data related to react	ivity available for this	product or its ingredients	-

Section 10. Stability and reactivity

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. Do not allow gas to accumulate in low or confined areas.
Incompatibility with various substances	:	Extremely reactive or incompatible with the following materials: oxidizing materials.
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

Product/ingredient name	Result	Species	Dose	Exposure
Butane	LC50 Inhalation Vapor	Rat	658000 mg/m³	4 hours

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.

: Not available. Information on the likely routes of exposure

Potential acute health effects

Eye contact	: Liquid can cause burns similar to frostbite.
Inhalation	: No known significant effects or critical hazards.

Section 11. Toxicological information

Skin contact	Dermal contact with rapidly evaporating liquid could result in freezing of the tissues frostbite.
Ingestion	Ingestion of liquid can cause burns similar to frostbite.
Symptoms related to the phy	al, chemical and toxicological characteristics
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
Delayed and immediate effect	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	<u>S</u>
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.
relatogenicity	•
Developmental 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

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: 5/7/2015. Da

Date of previous issue

 N-Butane

 Section 12. Ecological information

 Product/ingredient name
 LogPow
 BCF
 Potential

 Butane
 2.89
 low

<u>Mobility in soil</u>

coefficient (Koc)

Soil/water partition : Not available.

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

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.

	DOT	TDG	Mexico	IMDG	ΙΑΤΑ
UN number	UN1011	UN1011	UN1011	UN1011	UN1011
UN proper shipping name	BUTANE	BUTANE	BUTANE	BUTANE	BUTANE
Transport hazard class(es)	2.1	2.1	2.1	2.1	2.1
Packing group	-	-	-	-	-
Environment	No.	No.	No.	No.	No.
Additional information	Limited quantity Yes. Packaging instruction Passenger aircraft Quantity limitation: Forbidden. Cargo aircraft Quantity limitation: 150 kg Special provisions 19, T50	Explosive Limit and Limited Quantity Index 0.125 ERAP Index 3000 Passenger Carrying Ship Index Forbidden Passenger Carrying Road or Rail Index Forbidden Special provisions 29	-	-	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."

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Section 14. Transport information

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

J.S. Federal regulations		TSCA 8(a) CDR E United States inv	•	•			
		Clean Air Act (CA	A) 112 regu	lated flamma	able substand	es: Butane	
Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)	:	Not listed					
Clean Air Act Section 602 Class I Substances	:	Not listed					
Clean Air Act Section 602 Class II Substances	:	Not listed					
DEA List I Chemicals (Precursor Chemicals)	:	Not listed					
DEA List II Chemicals (Essential Chemicals)	:	Not listed					
<u>SARA 302/304</u>							
Composition/information	on i	ngredients					
No products were found.							
SARA 304 RQ		Not applicable.					
SARA 311/312							
Classification		Fire hazard Sudden release of	pressure				
Composition/information	on i	ngredients					
Name		%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Butane		100	Yes.	Yes.	No.	No.	No.

New York New Jersey Pennsylvania Canada inventory International regulations

- This material is not listed.
- : This material is listed.
- : This material is listed.
- : This material is listed or exempted.
- Date of issue/Date of revision

Section 15. Regulatory information

•	•
International lists	 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
Chemical Weapons Convention List Schedule II Chemicals	: Not listed
Chemical Weapons Convention List Schedule III Chemicals	: Not listed
<u>Canada</u>	
WHMIS (Canada)	: Class A: Compressed gas. Class B-1: Flammable gas.
	CEPA Toxic substances: This material is not 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.

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.

Quebec Designated Substances: This material is not listed.

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

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



Section 16. Other information

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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>

<u>History</u>	
Date of printing	: 5/7/2015.
Date of issue/Date of revision	: 5/7/2015.
Date of previous issue	: 10/15/2014.
Version	: 0.03
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 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 CFR – United States Code of Federal Regulations CPR – Controlled Products Regulations DSL – Domestic Substances List GWP – Global Warming Potential IARC – International Agency for Research on Cancer ICAO – 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
References	: Not available.
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Indicates information that has changed from previously issued version.
Notice to reader

Section 16. Other information

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.

Date d	of issue/Date	of	revision	: 5/	7/

13/13