Nitrogen (Refrigerated Liquid)

Safety Data Sheet

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

Date of issue: 05/12/2017 Version: 1.0

SECTION 1: Identification

1.1. Product identifier

Product form	:	Substance
Substance name	:	Nitrogen (Refrigerated Liquid)
CAS-No.	:	7727-37-9
Product code	:	CA-1001-05245
Formula	:	N_2
Synonyms	:	Cryogenic Liquid Nitrogen / Nitrogen / ALIGAL™ 1 / ALBee Cool / LASAL 2001

1.2. Recommended use and restrictions on use

Recommended uses and restrictions	:	Medical uses Special atmospheres for food Food freezing Inerting General analytical/synthetic chemical uses

1.3. Supplier

Air Liquide Canada Inc.
1250, René Lévesque West Blvd. Suite 1700
H3B 5E6 Montreal, QC - Canada
T 1-800-817-7697
www.airliquide.ca

1.4. Emergency telephone number

Emergency number	:	514-878-1667

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Classification (GHS-CA)

Gases under pressure : Refrigerated liquefied gas H281

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS-CA labelling

Hazard pictograms (GHS-CA) :

GHS04

Signal word (GHS-CA)	:	Warning
Hazard statements (GHS-CA)	:	H281 - Contains refrigerated gas; may cause cryogenic burns or injury OSHA-H01 - May displace oxygen and cause rapid suffocation
Precautionary statements (GHS-CA)	:	P403 - Store in a well-ventilated place P202 - Do not handle until all safety precautions have been read and understood P271 - Use only outdoors or in a well-ventilated area P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing P302 - IF ON SKIN: P336+P315 - Thaw frosted parts with lukewarm water. Do not rub affected area P282 - Wear cold insulating gloves and either face shield or eye protection CGA-PG05 - Use a back flow preventive device in the piping CGA-PG06 - Close valve after each use and when empty

2.3. Other hazards

Other hazards not contributing to the classification	:	Asphyxiant in high concentrations.

2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	Chemical name/Synonyms	Product identifier	%	Classification (GHS-CA)
Nitrogen (Refrigerated Liquid) (Main constituent)	Cryogenic Liquid Nitrogen / Nitrogen / ALIGALTM 1 / ALBee Cool / LASAL 2001	(CAS-No.) 7727-37-9	100	Press. Gas (Ref. Liq.), H281

Full text of hazard classes and H-statements : see section 16

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. Perform cardiopulmonary resuscitation if breathing stopped.

First-aid measures after skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

First-aid measures after eye contact : 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)

Most important symptoms and effects, both acute and delayed : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation.

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 : Water spray or fog.

5.2. Unsuitable extinguishing media

Unsuitable extinguishing media : Do not use water jet to extinguish.

5.3. Specific hazards arising from the hazardous product

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

Hazardous combustion products : None

5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Exposure to fire may cause containers to rupture/explode.

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. Exposure to fire may cause containers to rupture/explode. If possible, stop flow of product. Use water spray or fog to knock down fire fumes if possible.

Special protective equipment for fire fighters : Use self-contained breathing apparatus. Standard protective clothing and equipment (e.g, Self Contained Breathing Apparatus) for fire fighters. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Try to stop release. Evacuate area. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Use protective clothing. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

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 Air Liquide Canada location.

6.2. Methods and materials for containment and cleaning up

Methods and material for containment and cleaning up : Ventilate area. Liquid spillages can cause embrittlement of structural materials.

6.3. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection"

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Safe use of the product : The product must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularily) checked for leaks before use. Do not smoke while handling product. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.

Safe handling of the gas receptacle : Refer to supplier's container handling instructions. Do not allow backfeed into the container. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never use direct flame or electrical heating devices to raise the pressure of a container. Suck back of water into the container must be prevented.

7.2. Conditions for safe storage, including any incompatibilities

Conditions for safe storage, including any incompatibilities : Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Container valve guards or caps should be in place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

8.2. Appropriate engineering controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Oxygen detectors should be used when asphyxiating gases may be released. Consider the use of a work permit system e.g. for maintenance activities.

Environmental exposure controls : None necessary.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Gloves. Safety glasses. Protective clothing. Safety shoes.

Hand protection:

Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk.

Eye protection:

Wear safety glasses with side shields. Wear goggles and a face shield when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications

Respiratory protection:

Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

Thermal hazard protection:

Wear cold insulating gloves when transfilling or breaking transfer connections. Standard EN 511 - Cold insulating gloves.

Other information:

Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Gas
Appearance	:	No data available
Colour	:	Colourless liquid.
Odour	:	No odour warning properties.
Odour threshold	:	No data available
pH	:	No data available
Relative evaporation rate (butylacetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable for gases and gas mixtures.
Molecular mass	:	28 g/mol
Melting point	:	-210 °C
Freezing point	:	-210 °C
Boiling point	:	-196 °C
Flash point	:	Not applicable for gases and gas mixtures.
Critical temperature	:	-147 °C
Auto-ignition temperature	:	Not applicable.
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	No data available
Vapour pressure	:	Not applicable.
Vapour pressure at 50 °C	:	No data available
Critical pressure	:	3390 kPa
Relative density	:	0.8
Relative gas density	:	0.97
Solubility	:	Water: 20 mg/l
Log Pow	:	Not applicable for inorganic gases.
Viscosity, kinematic	:	Not applicable.
Viscosity, dynamic	:	Not applicable.
Explosive properties	:	Not applicable.
Oxidising properties	:	None.
Explosive limits	:	Non flammable.

9.2. Other information

Gas group	:	Press. Gas (Ref. Liq.)
Additional information	:	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	:	No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	None.
Conditions to avoid	:	None under recommended storage and handling conditions (see section 7).
Incompatible materials	:	None. For additional information on compatibility refer to ISO 11114.
Hazardous decomposition products	:	None.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified

Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified
Skin corrosion/irritation	:	Not classified
Serious eye damage/irritation	:	Not classified
Respiratory or skin sensitization	:	Not classified
Germ cell mutagenicity	:	Not classified
Carcinogenicity	:	Not classified
Reproductive toxicity	:	Not classified
STOT-single exposure	:	Not classified
STOT-repeated exposure	:	Not classified
Aspiration hazard	:	Not classified

SECTION 12: Ecological information

12.1. Toxicity

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

12.2. Persistence and degradability

Nitrogen (Refrigerated Liquid) (7727-37-9)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Nitrogen (Refrigerated Liquid) (7727-37-9)	
Log Pow	Not applicable for inorganic gases.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Nitrogen (Refrigerated Liquid) (7727-37-9)	
Log Pow	Not applicable for inorganic gases.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Other adverse effects	:	Can cause frost damage to vegetation.
Effect on global warming	:	No known effects from this product.
Effect on ozone layer	:	None.

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods	:	Consult supplier for specific recommendations. May be vented to atmosphere in a well ventilated place. Do not discharge into any place where its accumulation could be dangerous.
Additional information	:	None.
List of hazardous wastes	:	16 05 05 : Gases in pressure containers other than those mentioned in 16 05 04.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

Transportation of Dangerous Goods

UN-No. (TDG)	:	UN1977
TDG Primary Hazard Classes	:	2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gas.
Transport Document Description	:	UN1977 NITROGEN, REFRIGERATED LIQUID, 2.2
Proper Shipping Name	:	NITROGEN, REFRIGERATED LIQUID

Hazard labels (TDG)	:	2.2 - Non-flammable, non-toxic gases

Explosive Limit and Limited Quantity Index	:	0.125 L
Passenger Carrying Ship Index	:	450 kg
Excepted quantities (TDG)	:	E1
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	:	50 L

14.2. Transport information/DOT - USA

Department of Transport

DOT NA no.	:	UN1977
UN-No.(DOT)	:	1977
Transport Document Description	:	UN1977 Nitrogen, refrigerated liquid, 2.2
Proper Shipping Name (DOT)	:	Nitrogen, refrigerated liquid
Contains Statement Field Selection (DOT)	:	
Class (DOT)	:	2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115
Division (DOT)	:	2.2
Hazard labels (DOT)	:	2.2 - Non-flammable gas

Dangerous for the environment	:	No
DOT Special Provisions (49 CFR 172.102)	:	345 - “Nitrogen, refrigerated liquid (cryogenic liquid), UN1977” transported in open cryogenic receptacles with a maximum capacity of 1 L are not subject to the requirements of this subchapter. The receptacles must be constructed with glass double walls having the space between the walls vacuum insulated and each receptacle must be transported in an outer packaging with sufficient cushioning and absorbent materials to protect the receptacle from damage. 346 - “Nitrogen, refrigerated liquid (cryogenic liquid), UN1977” transported in accordance with the requirements for open cryogenic receptacles in §173.320 and this special provision are not subject to any other requirements of this subchapter. The receptacle must contain no hazardous materials other than the liquid nitrogen which must be fully absorbed in a porous material in the receptacle. T75 - When portable tank instruction T75 is referenced in Column (7) of the 172.101 Table, the applicable refrigerated liquefied gases are authorized to be transported in portable tanks in accordance with the requirements of 178.277 of this subchapter. TP5 - For a portable tank used for the transport of flammable refrigerated liquefied gases or refrigerated liquefied oxygen, the maximum rate at which the portable tank may be filled must not exceed the liquid flow capacity of the primary pressure relief system rated at a pressure not exceeding 120 percent of the portable tank's design pressure. For portable tanks used for the transport of refrigerated liquefied helium and refrigerated liquefied atmospheric gas (except oxygen), the maximum rate at which the tank is filled must not exceed the liquid flow capacity of the pressure relief device rated at 130 percent of the portable tank's design pressure. Except for a portable tank containing refrigerated liquefied helium, a portable tank shall have an outage of at least two percent below the inlet of the pressure relief device or pressure control valve, under conditions of incipient opening, with the portable tank in a level attitude. No outage is required for helium.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	320
DOT Packaging Non Bulk (49 CFR 173.xxx)	:	316
DOT Packaging Bulk (49 CFR 173.xxx)	:	318

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	50 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	500 kg
DOT Vessel Stowage Location	:	D - The material must be stowed ''on deck only'' on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.
Emergency Response Guide (ERG) Number	:	120
Special transport precautions	:	Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.
Other information	:	No supplementary information available.

14.3. Air and sea transport

IMDG

UN-No. (IMDG)	:	1977
Proper Shipping Name (IMDG)	:	NITROGEN, REFRIGERATED LIQUID
Transport Document Description (IMDG)	:	UN 1977 NITROGEN, REFRIGERATED LIQUID, 2.2
Class (IMDG)	:	2 - Gases
MFAG-No	:	120
Ship Safety Act	:	Gases under pressure/Gases nonflammable nontoxic under pressure(Dangerous Goods Notification Schedule first second and third Article Dangerous Goods Regulations)
Port Regulation Law	:	Hazardous materials/High pressure gas (Article 21, Paragraph 2 of Law, Article 12 rule, notice attached table that defines the type of dangerous goods)

IATA

UN-No. (IATA)	:	1977
Proper Shipping Name (IATA)	:	Nitrogen, refrigerated liquid
Transport Document Description (IATA)	:	UN 1977 Nitrogen, refrigerated liquid, 2.2
Class (IATA)	:	2
Civil Aeronautics Law	:	Gases under pressure/Gases nonflammable nontoxic under pressure(Hazardous materials notice Appended Table 1 Article 194 of the Enforcement Regulations)

SECTION 15: Regulatory information

15.1. National regulations

No additional information available

15.2. International regulations

No additional information available

SECTION 16: Other information

Date of issue	:	05/12/2017
Training advice	:	The hazard of asphyxiation is often overlooked and must be stressed during operator training.

Full text of H-statements:

H281	Contains refrigerated gas; may cause cryogenic burns or injury

SDS Canada (GHS)