

# NITROGEN, REFRIGERATED LIQUID

## Safety Data Sheet



### 1. IDENTIFICATION

**Product identifier**

**Product Name** NITROGEN, REFRIGERATED LIQUID

**Other means of identification**

**Safety data sheet number** LIND-P087  
**UN/ID no.** UN1977

**Recommended use of the chemical and restrictions on use**

**Recommended Use** Industrial and professional use.  
**Uses advised against** Consumer use

**Details of the supplier of the safety data sheet**

Messer North America, Inc. - Messer LLC - Messer Merchant Production LLC  
(formerly known as Linde North America, Inc., Linde LLC and Linde Merchant Production, Inc.)  
200 Somerset Corporate Blvd, Suite 7000  
Bridgewater, NJ 08807  
Phone: 908-464-8100  
www.messer-us.com

Messer Gas Puerto Rico, Inc.  
(formerly known as Linde Gas Puerto Rico, Inc.)  
Road 869, Km 1.8  
Barrio Palmas, Catano, PR 00962  
Phone: 787-641-7445

\* May include subsidiaries or affiliate companies/divisions.

For additional product information contact your local customer service.

**Emergency telephone number**

**Company Phone Number** +1 800-232-4726 (Messer National Operations Center, US)

CHEMTREC: 1-800-424-9300 (North America) +1-703-527-3887 (International)

## 2. HAZARDS IDENTIFICATION

### Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Gases under pressure	Refrigerated liquefied gas
Simple asphyxiants	Yes

### Label elements



Signal word

Warning

### **Hazard Statements**

Contains refrigerated gas; may cause cryogenic burns or injury  
May displace oxygen and cause rapid suffocation

### **Precautionary Statements - Prevention**

Do not handle until all safety precautions have been read and understood  
Use and store only outdoors or in a well ventilated place  
Wear cold insulating gloves, face shield, and eye protection  
Use a backflow preventive device in piping  
Do NOT change or force fit connections  
Close valve after each use and when empty  
Always keep container in upright position

### **Precautionary Statements - Response**

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical attention/advice.  
IF ON SKIN: Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

### **Hazards not otherwise classified (HNOC)**

Not applicable

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	Volume %	Chemical Formula
NITROGEN	7727-37-9	>99	N <sub>2</sub>

## 4. FIRST AID MEASURES

### Description of first aid measures

<b>General advice</b>	Show this safety data sheet to the doctor in attendance.
<b>Inhalation</b>	Remove to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention immediately.
<b>Skin contact</b>	For dermal contact or suspected frostbite, remove contaminated clothing and flush affected areas with lukewarm water. DO NOT USE HOT WATER. A physician should see the patient promptly if contact with the product has resulted in blistering of the dermal surface or in deep tissue freezing.
<b>Eye contact</b>	If frostbite is suspected, flush eyes with cool water for 15 minutes and obtain immediate medical attention.
<b>Ingestion</b>	Not an expected route of exposure.
<b>Self-protection of the first aider</b>	RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

### Most important symptoms and effects, both acute and delayed

<b>Symptoms</b>	Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death. Contact with evaporating liquid may cause cold burns/frostbite.
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### Indication of any immediate medical attention and special treatment needed

<b>Note to physicians</b>	Treat symptomatically.
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## 5. FIRE-FIGHTING MEASURES

### Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media None.

### Specific extinguishing methods

Continue to cool fire exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.

### Specific hazards arising from the chemical

Non-flammable gas. Cylinders may rupture under extreme heat.

### Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

**Personal precautions** Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas. Monitor oxygen level. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Use personal protection recommended in Section 8.

**Other Information** When in contact with refrigerated/cryogenic liquids, many materials become brittle and are likely to break without warning.

### Environmental precautions

**Environmental precautions** Prevent spreading of vapors through sewers, ventilation systems and confined areas.

### Methods and material for containment and cleaning up

**Methods for containment** Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest Messer location.

**Methods for cleaning up** Return Portable Cryogenic Container to Messer or an authorized distributor.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

#### **Advice on safe handling**

Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cold fluids. The extremely cold metal will cause moist flesh to stick fast and tear when one attempts to withdraw from it. Do NOT change or force fit connections

Liquid nitrogen is delivered into stationary vacuum jacketed vessels at the customer's location or in portable vacuum-jacketed "liquid" cylinders requiring special handling methods. Consult manufacturer's instructions.

Due to the extremely cold liquid, uninsulated transfer may condense air. The liquefied air may flash off nitrogen, leaving an oxygen enriched liquid. Do not allow the liquefied air to contact oils, grease, or other combustible materials such as asphalt or motor oil. Vessels for liquid nitrogen are designed specifically for nitrogen service. Vessels and associated structures are not designed to support higher density fluids. Density, liquid at saturation pressure at 2.17°K (-271°C): 0.146 Kg/l.

Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distance, use a cart designed to transport cylinders. Never attempt to lift a cylinder by its valve protection cap. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing leak to occur. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Use only with adequate ventilation. Use a backflow preventive device in piping. Use an adjustable strap wrench to remove over-tight or rusted caps. Close valve after each use and when empty. Ensure the complete gas system has been checked for leaks before use.

Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner's written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

Only experienced and properly instructed persons should handle gases under pressure. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, pamphlet CGA-P1, Safe Handling of Compressed Gases in Containers. Use only with equipment rated for cylinder pressure.

For additional recommendations, consult Compressed Gas Association's Pamphlets, AV-8, CGA-341, G-10.1, P-1, P-9, P-12, P-14, and P-18.

### Conditions for safe storage, including any incompatibilities

#### **Storage Conditions**

Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Keep at temperatures below 52°C / 125°F. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Full and empty cylinders should be segregated. Stored containers should be periodically checked for general condition and leakage.

#### **Incompatible materials**

None known.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Control parameters

#### Exposure Guidelines

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
NITROGEN 7727-37-9	: See Appendix F: Minimal Oxygen Content	None	None

ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health

### Appropriate engineering controls

**Engineering Controls** Local exhaust ventilation to prevent accumulation of high concentrations and maintain air-oxygen levels at or above 19.5%. Oxygen detectors should be used when asphyxiating gases may be released. Showers. Eyewash stations.

### Individual protection measures, such as personal protective equipment

**Eye/face protection** Wear safety glasses with side shields (or goggles). If splashes are likely to occur, wear: Goggles. Face-shield.

**Skin and body protection** Work gloves and safety shoes are recommended when handling cylinders. Wear cold insulating gloves when handling liquid.

**Respiratory protection** Use positive pressure airline respirator with escape cylinder or self contained breathing apparatus for oxygen-deficient atmospheres (<19.5%).

**General Hygiene Considerations** Handle in accordance with good industrial hygiene and safety practice. Do not get in eyes, on skin, or on clothing.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Physical state</b>	Gas
<b>Appearance</b>	Colorless
<b>Odor</b>	Odorless
<b>Odor threshold</b>	No information available
<b>pH</b>	Not applicable
<b>Melting/freezing point</b>	-209.9 °C / -345.9 °F
<b>Evaporation rate</b>	Not applicable
<b>Flammability (solid, gas)</b>	Non-flammable gas
<b>Lower flammability limit:</b>	Not applicable
<b>Upper flammability limit:</b>	Not applicable
<b>Flash point</b>	Not applicable
<b>Autoignition temperature</b>	No data available
<b>Decomposition temperature</b>	No data available
<b>Water solubility</b>	Very slight
<b>Partition coefficient</b>	No data available
<b>Kinematic viscosity</b>	Not applicable

Chemical Name	Molecular weight	Boiling point/range	Vapor Pressure	Vapor density (air =1)	Gas Density kg/m <sup>3</sup> @20°C	Critical Temperature
NITROGEN	28.01	-196 °C	Above critical temperature	0.97	1.153	-146.9 °C

**10. STABILITY AND REACTIVITY****Reactivity**

Not reactive under normal conditions

**Chemical stability**

Stable under normal conditions.

**Explosion data**

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

**Possibility of Hazardous Reactions**

None under normal processing.

**Conditions to avoid**

None under recommended storage and handling conditions (see Section 7).

**Incompatible materials**

None known.

**Hazardous Decomposition Products**

None known.

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

<b>Inhalation</b>	Product is a simple asphyxiant.
<b>Skin contact</b>	Contact with evaporating liquid may cause cold burns/frostbite.
<b>Eye contact</b>	Contact with evaporating liquid may cause cold burns/frostbite.
<b>Ingestion</b>	Not an expected route of exposure.

### Information on toxicological effects

<b>Symptoms</b>	Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<=19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.
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### Delayed and immediate effects as well as chronic effects from short and long-term exposure

<b>Irritation</b>	Not classified.
<b>Sensitization</b>	Not classified.
<b>Germ cell mutagenicity</b>	Not classified.
<b>Carcinogenicity</b>	This product does not contain any carcinogens or potential carcinogens listed by OSHA, IARC or NTP.
<b>Reproductive toxicity</b>	Not classified.
<b>Developmental Toxicity</b>	Not classified.
<b>STOT - single exposure</b>	Not classified.
<b>STOT - repeated exposure</b>	Not classified.
<b>Chronic toxicity</b>	None known.
<b>Aspiration hazard</b>	Not applicable.

### Numerical measures of toxicity

#### **Product Information**

<b>Oral LD50</b>	No information available
<b>Dermal LD50</b>	No information available
<b>Inhalation LC50</b>	No information available
<b>Inhalation LC50</b>	No information available.

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

No known acute aquatic toxicity.

### Persistence and degradability

Not applicable.

### Bioaccumulation

No information available.

### Other adverse effects

Can cause frost damage to vegetation.

**13. DISPOSAL CONSIDERATIONS****Waste treatment methods****Disposal of wastes**

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to Messer for proper disposal.

**14. TRANSPORT INFORMATION****DOT**

<b>UN/ID no.</b>	UN1977
<b>Proper shipping name</b>	Nitrogen, refrigerated liquid
<b>Hazard Class</b>	2.2
<b>Special Provisions</b>	T75, TP5, 346, 345
<b>Description</b>	UN1977, Nitrogen, refrigerated liquid, 2.2
<b>Emergency Response Guide Number</b>	120

**TDG**

<b>UN/ID no.</b>	UN1977
<b>Proper shipping name</b>	Nitrogen, refrigerated liquid
<b>Hazard Class</b>	2.2
<b>Description</b>	UN1977, Nitrogen, refrigerated liquid, 2.2

**IATA**

<b>UN/ID no.</b>	UN1977
<b>Proper shipping name</b>	Nitrogen, refrigerated liquid
<b>Hazard Class</b>	2.2
<b>ERG Code</b>	2L
<b>Special Provisions</b>	A152
<b>Description</b>	UN1977, Nitrogen, refrigerated liquid, 2.2

**IMDG**

<b>UN/ID no.</b>	UN1977
<b>Proper shipping name</b>	Nitrogen, refrigerated liquid
<b>Hazard Class</b>	2.2
<b>EmS-No.</b>	F-C, S-V
<b>Special Provisions</b>	345, 346
<b>Description</b>	UN1977, Nitrogen, refrigerated liquid, 2.2

## 15. REGULATORY INFORMATION

### INTERNATIONAL INVENTORIES

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies

#### Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

### US FEDERAL REGULATIONS

#### **SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

#### **SARA 311/312 Hazard Categories**

Should this product meet EPCRA 311/312 reporting criteria at 40 CFR 370, refer to Section 2 of this SDS for appropriate classifications.

#### **CERCLA**

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

#### **Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)**

This product does not contain any substances regulated as hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act Amendments of 1990.

#### **CWA (Clean Water Act)**

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

#### **Risk and Process Safety Management Programs**

This material, as supplied, does not contain any regulated substances with specified thresholds under 40 CFR Part 68. This product does not contain any substances regulated as Highly Hazardous Chemicals pursuant to the 29 CFR Part 1910.110.

### US STATE REGULATIONS

#### **California Proposition 65**

This product does not contain any Proposition 65 chemicals

#### **U.S. State Right-to-Know Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Nitrogen 7727-37-9	X	X	X

**16. OTHER INFORMATION**

<b>NFPA</b>	<b>Health hazards</b> 3	<b>Flammability</b> 0	<b>Instability</b> 0	<b>Physical and Chemical Properties</b> Simple asphyxiant
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**Note:** Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009, CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.

**Issue Date** 17-Feb-2015  
**Revision Date** 01-Mar-2019  
**Revision Note** SDS sections updated; 1

LIND-P087

**General Disclaimer**

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**End of Safety Data Sheet**