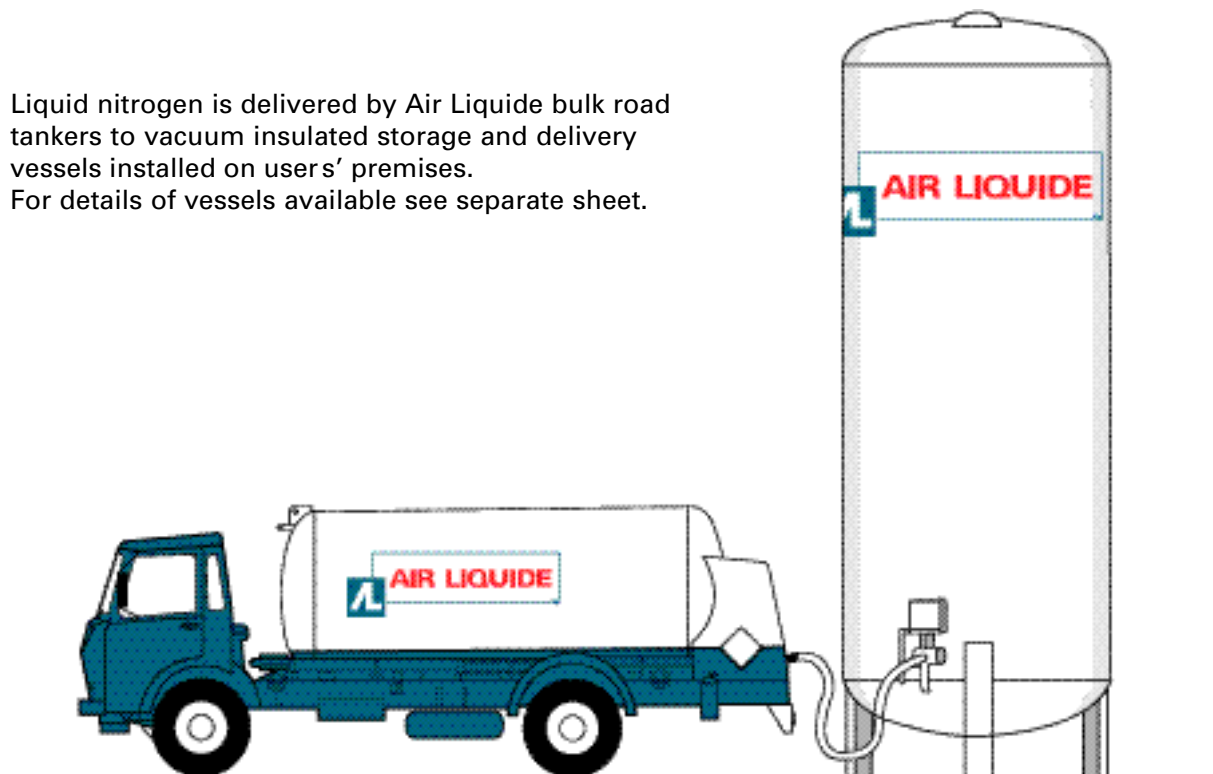


# Nitrogen, liquid

UN	1977
HAZCHEM	2RE
CLASS	2.2

## T E C H S P E C S

Liquid nitrogen is delivered by Air Liquide bulk road tankers to vacuum insulated storage and delivery vessels installed on users' premises.  
For details of vessels available see separate sheet.



### SPECIFICATION

Nitrogen > 99.9%

### PHYSICAL DATA

Chemical Symbol	N <sub>2</sub>
Boiling Point	-195.8°C
Relative Density (Air = 1)	0.967
Molecular Weight	28.013
Critical Temperature	-147.1°C
Flashpoint	Non-flammable
Density of Gas (@101.3 kPa & 15°C)	1.170 kg/m <sup>3</sup>
Density of Liquid (B.Pt.)	809 kg/m <sup>3</sup>
Specific Volume (@101.3 kPa & 15°C)	0.855 m <sup>3</sup> /kg

### PROPERTIES

Nitrogen is colourless and odourless.  
Nitrogen constitutes 78% of the composition of air.  
Nitrogen does not support life, it is non-toxic.  
It is non-flammable and will not support combustion.

### USES

Liquid Nitrogen is widely used as a cold source and hence plays the role of a cold accumulator.  
It is employed in various fields.

- Storage of perishable goods: freezing, sub-freezing and freeze drying, maintenance of food products and pre-cooked meals at low temperature, transportation in inert atmosphere by refrigerator trucks.

- Storage of biological products: freezing, sub-freezing and freeze drying, low temperature storage of blood, living tissues and semen employed for artificial insemination.
- Cryosurgery of the brain and eyes.
- Marking of animals.
- Metallurgy: cooling below 0°C, impact tests, jointing by contraction (shrink fitting) of small parts such as valve seats, together with large items such as rolling mill rolls.
- Public works: freezing of waterlogged terrain.
- Recycling industries: pre-breakage cooling of car bodies, electric motors, electric cable cores.
- Hardening of plastics before crushing or grinding.
- Aircraft manufacture: simulation of space flights.
- Nuclear industry: cold traps, cryopumps.
- Scientific research: cold traps, miscellaneous investigations.
- Scenic effects: formation of clouds by condensation of atmospheric moisture.



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## TECH SPECS

## HANDLING & SAFETY

### HAZARDS

Should nitrogen replace oxygen in air there is a risk of asphyxia: air containing less than 16% oxygen is dangerous.

Extremely low temperature.(-196°C)

### MATERIALS COMPATIBILITY

Nitrogen is non-corrosive and so any common metal is acceptable, provided equipment is designed to withstand process pressure and temperature. Equipment to handle liquid nitrogen must be constructed of suitable material for the low temperature encountered.

### PRECAUTIONS IN USE

Use only in well ventilated area to prevent accumulation of high concentration of nitrogen. Ensure that oxygen content of air is maintained above 18%.

It is recommended that the user of liquid nitrogen is familiar with relevant sections of the Australian Standard 1894-1997 "The storage and handling of non-flammable cryogenic and refrigerated liquids", available from Standards Australia.

### PERSONAL PROTECTION

Full face mask, well fitting leather gloves and full overalls without cuffs should be worn when handling liquid nitrogen supply systems.

### FIRST AID

If victim is conscious:

- Move to uncontaminated area to breathe fresh air.
- Keep warm and quiet.
- Call doctor.

If victim is unconscious:

- Move to uncontaminated area and give assisted respiration.
- When breathing is restored, treatment as above. Continued treatment should be symptomatic and supportive.

Cold burns/Frostbite:

- Flush with luke warm water for at least 10 minutes then treat as thermal burns.

- Seek hospital attention for all but the most superficial cases. Do not apply direct heat or give alcohol or cigarettes.

- Protect frozen parts from infection.

Hospital treatment of cold burns/frostbite may differ from heat burns.

### ADDITIONAL INFORMATION

The information, recommendations and data contained in this publication are intended to give basic guidance to users of Air Liquide gases for their safe handling and use.

Material Safety Data Sheets (MSDS) for gases and gas mixtures supplied by Air Liquide are also available.

It is essential for the safe use of gases that personnel are properly trained and are fully aware of the possible hazards.

Further information and advice on any matter relating to the safe handling or use of these products may be obtained from the nearest Air Liquide office.