Safety data sheet · UN 1066

Nitrogen (N2

compressed) — safety data sheet (SDS / MSDS)

By Mithillessh Garg (kigl.co.in/about/history#mithillessh-garg), Director (Gas Supply)

Nitrogen (N_2, CAS 7727-37-9, UN 1066) is inert, non-toxic and non-flammable, and kills by displacing oxygen with no warning whatsoever. It has no smell and produces no sensation of breathlessness. Confined space entry after a nitrogen purge requires oxygen monitoring, without exception.

Request a quotation (kigl.co.in/contact) 0361-4519363

Safety data sheet (kigl.co.in/sds/argon)

UN 1066
UN number (compressed)

UN 1977
UN number (refrigerated liquid)

7727-37-9
CAS number

28.0134 g/mol
Molecular weight

−195.8 °C
Normal boiling point

Section 1 — Identification

Product name

Nitrogen, compressed **Chemical formula:** N_2 **CAS number:** 7727-37-9 · **EC number:** 231-783-9 · **UN number:** UN 1066 **Specification:** IS 1747

Identified uses

Purging, blanketing and inerting; pressure transfer; laser cutting assist gas; controlled atmospheres for heat treatment; root purging; food packaging; cryogenic cooling and freezing (liquid). **Uses advised against:** Ventilation or cooling of personnel or workspaces. Blowing down clothing. Any use in a confined space without oxygen monitoring.

Supplier

The Kamrup Industrial Gases Limited.

Section 2 — Hazards identification

GHS classification

Gases under pressure — compressed gas (refrigerated liquefied gas for the liquid product).

Signal word

WARNING

Hazard statements

- H280 — Contains gas under pressure; may explode if heated.

- (Refrigerated liquid) H281 — Contains refrigerated gas; may cause cryogenic burns or injury.

The hazard the classification does not capture. Nitrogen has no harmonised health-hazard classification because it is not toxic. That has repeatedly led people to treat it as harmless. **Nitrogen asphyxiates without any warning at all** — no smell, no irritation, and critically **no sensation of breathlessness**, because the body's urge to breathe responds to carbon dioxide build-up rather than to oxygen shortage.

Loss of consciousness can occur within one or two breaths in a nitrogen-rich atmosphere.

Section 3 — Composition

Component	CAS	Concentration
Nitrogen	7727-37-9	≥99.5 % (industrial, IS 1747); higher grades on request

Single-substance product.

Section 4 — First aid

Inhalation

Remove to fresh air — **but do not enter an oxygen-deficient atmosphere without air-supplied breathing apparatus and a standby person**. Rescuer fatalities are a recurring feature of nitrogen incidents. Give oxygen if trained. If breathing has stopped, give artificial respiration. Seek immediate medical attention.

Skin contact (liquid or cold gas)

Cold burns: flush with copious tepid water, do not rub, do not apply direct heat, cover loosely with a sterile dressing and seek immediate medical attention.

Eye contact (liquid or cold gas)

Flush with tepid water for at least 15 minutes. Seek immediate medical attention.

Section 5 — Firefighting

Non-flammable and does not support combustion. Nitrogen will extinguish fire by displacing oxygen.

Specific hazards. Cylinders exposed to fire may rupture. Cool from a protected position or evacuate. Discharge into a confined space during firefighting creates an asphyxiating atmosphere.

Section 6 — Accidental release

Evacuate and ventilate. Do not enter the affected area without oxygen monitoring and, where the atmosphere is or may be deficient, air-supplied breathing apparatus.

For a **liquid** spill, note the large expansion on vaporisation: a modest volume of liquid produces a very large volume of gas and can render a room oxygen-deficient quickly. Also treat the cold hazard to personnel and the embrittlement hazard to floors, drains and equipment not rated for cryogenic temperatures.

Section 7 — Handling and storage

Gas

Secure cylinders upright. Open valves slowly. Never use nitrogen for ventilation, cooling or blowing down. Ensure adequate ventilation wherever nitrogen is discharged.

Liquid

Handle only with cryogenic gloves, face shield and covered footwear. Use only vessels designed and rated for cryogenic service. **Never seal liquid nitrogen in a closed container** — vaporisation will rupture it. Ensure the storage area is well ventilated and, where volumes warrant it, fitted with oxygen monitoring.

Confined spaces

Any vessel, pit or enclosure that has been purged with nitrogen must be treated as an oxygen-deficient atmosphere until measurement proves otherwise. Measure before entry, monitor continuously during entry, and post a standby person outside.

Section 8 — Exposure controls

Nitrogen has no occupational exposure limit because it is not toxic. The control parameter is **oxygen concentration**, not nitrogen concentration.

Entry to any space where nitrogen may be present requires oxygen measurement. **19.5 % oxygen is the widely used minimum for safe entry**.

Personal protection: oxygen monitoring for confined-space work; air-supplied breathing apparatus where deficiency is possible; cryogenic gloves, face shield and covered footwear for liquid handling.

Section 9 — Physical and

chemical properties

Property	Value	Source
Physical state	Gas (compressed) or cryogenic liquid	—
Appearance	Colourless	—
Odour	Odourless	—
Molecular weight	28.0134 g/mol	NIST
Normal boiling point	−195.8 °C (77.34 K)	NIST
Triple point	−210.0 °C (63.14 K) at 0.1252 bar	NIST
Critical temperature	−146.96 °C (126.19 K)	NIST
Critical pressure	33.978 bar	NIST
Vapour density (air = 1)	≈0.97 — very close to air	Calculated from molar mass, NIST Chemistry WebBook
Flammability	Non-flammable	—
Oxidising properties	None	—

Vapour density ≈0.97 is a hazard in itself. Nitrogen is almost exactly as dense as air, so a release neither rises and disperses nor settles predictably into a known low point. It simply mixes and lingers wherever ventilation is poor. Do not assume a leak will clear itself.

Thermophysical constants from the NIST Chemistry WebBook (public domain). Remaining values are standard literature.

Section 10 — Stability and reactivity

Stable and chemically inert under normal conditions.

Conditions to avoid: heat, and for the liquid, contact with materials not rated for cryogenic service, which may embrittle and fail.

Note. Although inert at ambient temperature, nitrogen dissociates in a welding arc and can form nitrides in weld metal — the reason it is not used as a general shielding gas. See argon (kigl.co.in/argon-gas).

Section 11 — Toxicological information

Not toxic. A simple asphyxiant. Symptoms of oxygen deficiency progress rapidly from impaired coordination and judgement to unconsciousness and death, typically without the casualty recognising anything is wrong.

Section 12 — Ecological information

Not classified as environmentally hazardous. Nitrogen is the principal component of air; release causes no ecological harm.

Section 13 — Disposal

Vent to atmosphere in a safe, well-ventilated **outdoor** location away from confined spaces, pits and building intakes. Return cylinders to the supplier.

Section 14 — Transport

UN number	UN 1066 (compressed) · UN 1977 (refrigerated liquid)
Proper shipping name	NITROGEN, COMPRESSED
Class	2.2

Transport upright and secured, valves closed, caps fitted, in a ventilated vehicle. Never carry cylinders in an enclosed passenger compartment.

Section 15 — Regulatory information

- **Gas Cylinders Rules, 2016** (PESO)
- **IS 1747** — compressed nitrogen specification
- **IS 7285** — seamless steel cylinders
- **IS 3224** — cylinder valves
- **EN ISO 14175** — nitrogen in welding shielding gas classification
- **ADR 2025** — UN 1066 / UN 1977

Section 16 — Other information

Revision 1, issued 6 August 2026.

Relates to nitrogen as supplied and does not release the user from assessing their own installation and application. A signed PDF copy is available on request for audit files; this HTML page is the current version.

PRODUCT	CAS NUMBER	UN NUMBER
Nitrogen, compressed	**7727-37-9**	**UN 1066**
TRANSPORT CLASS	SPECIFICATION	REVISION
2.2 — Non-flammable, non-toxic gas	**IS 1747**	**1 · 6 August 2026**

Also known as: N_2 · Liquid nitrogen when refrigerated · LIN

Nitrogen — frequently asked questions

If nitrogen is 78 % of the air I breathe, how can it be dangerous? +

Will I feel breathless before I collapse? +

Is it safe to enter a vessel after nitrogen purging if it has been left open? +

Why do so many nitrogen fatalities involve two people? +

What are the hazards specific to liquid nitrogen? +

Can nitrogen be used to blow down clothing or clear a workspace? +

References

Bureau of Indian Standards. (2021). *Valve for compressed gas cylinders excluding LPG cylinders — Specification* (IS 3224:2021, Fourth Revision).

Bureau of Indian Standards. (2023). *Nitrogen, compressed gas and liquid — Specification* (IS 1747:2023, Second Revision).

Government of India. (2016). *Gas Cylinders Rules, 2016* (G.S.R. 1081(E)). Petroleum and Explosives Safety Organisation.

Linstrom, P. J., & Mallard, W. G. (Eds.). (n.d.). *NIST Chemistry WebBook* (NIST Standard Reference Database 69). National Institute of Standards and Technology.

National Oceanic and Atmospheric Administration, National Aeronautics and Space Administration, & United States Air Force. (1976). *U.S. Standard Atmosphere, 1976*.

ENQUIRIES

Request a quotation

State the gas or equipment, the quantity or capacity, and your location. KIGL will confirm the grade, the cylinder or plant size, and whether the location can be served from Noonmati, or through the agent network.

Request a quotation (kigl.co.in/contact)

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