

Nitrogen dioxide - Dinitrogen tetroxide**AL090**

Label 2.3 : Toxic gas.



Label 5.1 : Oxidizing substances.



Label 8 : Corrosive substance.



T+ : Very toxic

1 IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Trade name : Nitrogen dioxide - Dinitrogen tetroxide
MSDS No : AL090
Company identification : AIR LIQUIDE SA
France
See paragraph 16 "OTHER INFORMATION"
Emergency phone nr : See paragraph 16 "OTHER INFORMATION"

2 COMPOSITION / INFORMATION ON INGREDIENTS

Substance / Preparation : Preparation.

Substance name	Contents	CAS No	EC No	Index No	Classification
Nitrogen dioxide	:	10102-44-0	233-272-6	007-002-00-0	T+; R26 C; R34
Dinitrogen tetroxide	:	10544-72-6	234-126-4	007-002-00-0	T+; R26 C; R34

Contains no other components or impurities which will influence the classification of the product.

3 HAZARDS IDENTIFICATION

Hazards identification : Liquefied gas.
Very toxic by inhalation.
Corrosive to eyes, respiratory system and skin.
Oxidant. Strongly supports combustion. May react violently with combustible materials.

4 FIRST AID MEASURES**First aid measures**

- **Inhalation** : Very toxic by inhalation.
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- **Skin/eye contact** : May cause chemical burns to skin and cornea (with temporary disturbance to vision).
Immediately flush eyes thoroughly with water for at least 15 minutes.
Remove contaminated clothing. Drench affected area with water for at least 15 minutes.
Obtain medical assistance.
- **Ingestion** : Ingestion is not considered a potential route of exposure.

5 FIRE-FIGHTING MEASURES

Flammable class : Non flammable.
Specific hazards : Supports combustion.
Exposure to fire may cause containers to rupture/explode.



SAFETY DATA SHEET

Page : 2 / 5

Revised edition no : 1

Date : 15/7/2005

Supersedes : 0/0/0

Nitrogen dioxide - Dinitrogen tetroxide

AL090

5 FIRE-FIGHTING MEASURES (continued)

- Hazardous combustion products** : None that are more toxic than the product itself.
- Extinguishing media**
- **Suitable extinguishing media** : All known extinguishants can be used.
- Specific methods** : If possible, stop flow of product.
Move away from the container and cool with water from a protected position.
- Special protective equipment for fire fighters** : Use self-contained breathing apparatus and chemically protective clothing.

6 ACCIDENTAL RELEASE MEASURES

- Personal precautions** : Evacuate area.
Ensure adequate air ventilation.
Eliminate ignition sources.
Use self-contained breathing apparatus and chemically protective clothing.
- Environmental precautions** : Try to stop release.
Reduce vapour with fog or fine water spray.
Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.
- Clean up methods** : Ventilate area.
Wash contaminated equipment or sites of leaks with copious quantities of water.
Hose down area with water.

7 HANDLING AND STORAGE

- Storage** : Segregate from flammable gases and other flammable materials in store.
Keep container below 50°C in a well ventilated place.
- Handling** : Use no oil or grease.
Open valve slowly to avoid pressure shock.
Refer to supplier's container handling instructions.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Do not allow backfeed into the container.
Suck back of water into the container must be prevented.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

- Personal protection** : Keep suitable chemically resistant protective clothing readily available for emergency use.
Keep self contained breathing apparatus readily available for emergency use.
Do not smoke while handling product.
Ensure adequate ventilation.
Protect eyes, face and skin from liquid splashes.
- Occupational Exposure Limits** : Nitrogen dioxide : TLV© -TWA [ppm] : 3
Nitrogen dioxide : TLV© -STEL [ppm] : 5
Nitrogen dioxide : OEL (UK)-LTEL [ppm] : 5
Nitrogen dioxide : OEL (UK)-STEL [ppm] : 5
Nitrogen dioxide : VLE - France [ppm] : 3
Nitrogen dioxide : MAK - Germany [ppm] : 5
Dinitrogen tetroxide : TLV© -TWA [ppm] : 3 (as Nitrogen dioxide)
Dinitrogen tetroxide : TLV© -STEL [ppm] : 5 (as Nitrogen dioxide)
Dinitrogen tetroxide : OEL (UK)-LTEL [ppm] : 5 (as Nitrogen dioxide)
Dinitrogen tetroxide : OEL (UK)-STEL [ppm] : 5 (as Nitrogen dioxide)
Dinitrogen tetroxide : VLE - France [ppm] : 3 (as Nitrogen dioxide)



SAFETY DATA SHEET

Page : 3 / 5

Revised edition no : 1

Date : 15/7/2005

Supersedes : 0/0/0

Nitrogen dioxide - Dinitrogen tetroxide

AL090

8 EXPOSURE CONTROLS / PERSONAL PROTECTION (continued)

Dinitrogen tetroxide : MAK - Germany [ppm] : 5 (as Nitrogen dioxide)

9 PHYSICAL AND CHEMICAL PROPERTIES

Physical state at 20 °C	: Liquefied gas.
Colour	: Brownish gas.
Odo(u)r	: Poor warning properties at low concentrations.
Molecular weight	: 46
Melting point [°C]	: -11.2
Boiling point [°C]	: 21.1
Critical temperature [°C]	: 158
Vapour pressure, 20°C	: 1 bar
Relative density, gas (air=1)	: 2.8
Relative density, liquid (water=1)	: 1.4
Solubility in water [mg/l]	: No reliable data available.
Flammability range [vol% in air]	: Oxidiser.
Auto-ignition temperature [°C]	: Not applicable.
Other data	: Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

10 STABILITY AND REACTIVITY

Stability and reactivity	: Violently oxidises organic material. May react violently with reducing agents. May react violently with combustible materials. Reacts with water to form corrosive acids. May react violently with alkalis. With water causes rapid corrosion of some metals.
--------------------------	--

11 TOXICOLOGICAL INFORMATION

Toxicity information	: Delayed fatal pulmonary oedema possible. Severe corrosion to skin, eyes and respiratory tract at high concentrations.
LC50 [ppm/1h]	: 115

12 ECOLOGICAL INFORMATION

Ecological effects information	: May cause pH changes in aqueous ecological systems.
--------------------------------	---

13 DISPOSAL CONSIDERATIONS

General	: Avoid discharge to atmosphere. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Gas may be scrubbed in alkaline solution under controlled conditions to avoid violent reaction. Do not discharge into any place where its accumulation could be dangerous.
---------	--



SAFETY DATA SHEET

Page : 4 / 5

Revised edition no : 1

Date : 15/7/2005

Supersedes : 0/0/0

Nitrogen dioxide - Dinitrogen tetroxide**AL090**

13 DISPOSAL CONSIDERATIONS (continued)

Contact supplier if guidance is required.

14 TRANSPORT INFORMATION

UN No.	: 1067
H.I. nr	: 265
ADR/RID	
- Proper shipping name	: DINITROGEN TETROXIDE (NITROGEN DIOXIDE)
- ADR Class	: 2
- ADR/RID Classification code	: 2 TOC
- Labelling ADR	: Label 2.3 : Toxic gas. Label 5.1 : Oxidizing substances. Label 8 : Corrosive substance.
Other transport information	: 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 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. - Ensure there is adequate ventilation. - Compliance with applicable regulations.

15 REGULATORY INFORMATION

EC Classification	: T+; R26 C; R34
EC Labelling	
- Symbol(s)	: T+ : Very toxic. C : Corrosive.
- R Phrase(s)	: R26 : Very toxic by inhalation. R34 : Causes burns.
- S Phrase(s)	: S9 : Keep container in a well-ventilated place. S26 : In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S28 : After contact with skin, wash immediately with S36/37/39 : Wear suitable protective clothing, gloves and eye/face protection. S45 : In case of accident or if you feel unwell, seek medical advice immediately (show the label when possible).

16 OTHER INFORMATION

Ensure operators understand the toxicity hazard.
Users of breathing apparatus must be trained.

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws.

Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.



SAFETY DATA SHEET

Page : 5 / 5

Revised edition no : 1

Date : 15/7/2005

Supersedes : 0/0/0

Nitrogen dioxide - Dinitrogen tetroxide

AL090

16 OTHER INFORMATION (continued)

Recommended uses and restrictions : This SDS is for information purposes only and is subject to change without notice. [Prior to purchase of products, please contact your local AIR LIQUIDE office for a complete SDS (with Manufacturer's name and emergency phone number).]

End of document