

MATERIAL SAFETY DATA SHEET (MSDS)

CLASS 2.2 – NON-FLAMMABLE, NON-TOXIC GASES

1. CHEMICAL PRODUCT IDENTIFICATION

1.1 PRODUCT IDENTIFIER:

This data sheet is about substances and mixtures that are characterized as non-flammable, non-toxic gases which are included in Class 2.2, according UNITED NATIONS Committee of Experts on the Transport of Dangerous Goods (UN). A gas (Class 2) is a substance which:

- At 50 °C has a vapour pressure greater than 300 kPa. or
- is completely gaseous at 20 °C at a standard pressure of 101.3 kPa.

The class comprises compressed gases, liquefied gases, dissolved gases, refrigerated liquefied gases, mixtures of one or more gases with one or more vapours of substances of other classes, articles charged with a gas and aerosols.


A non-flammable, non-toxic gas (Class 2.2) means a gas which:

- is asphyxiant - gas which dilute or replace the oxygen normally in the atmosphere; or
- is oxidizing - gases which may, generally by providing oxygen, cause or contribute to the combustion of other material more than air does; or
- does not come under the other classes.

The following products have been recorded in the present MSDS: Oxygen, Carbon Dioxide, Helium, Argon

1.2 RELEVANT IDENTIFIED USES:

Industrial and professional. Perform risk assessment prior to use.

Emergency telephone number:  National Emergency Centre: 166
National Poison Centre: (+30) 2107793777

2. HAZARDS IDENTIFICATION

2.1 CLASSIFICATION OF HAZARDS

2.1.1 According to GHS (EC Regulation 1272/2008)



GHS04

- Gas under pressure (Press. Gas): H280

H280: Contains gas cylinder under pressure; may explode if heated



GHS03 (Ref. to OXYGEN)

- Oxidiser: H270

H270: May cause or intensify fire; oxidiser.

2.1.2 According to DSD-DPD (Directive 67/548/EEC)



(Ref. to OXYGEN)

- Oxidizing R8

R8: Contact with combustible material may cause fire.

2.2 LABELLING:

- According to GHS (EC Regulation 1272/2008)

Signal word: **D a n g e r**

Hazard pictograms (at least a subset): GHS04, (Ref. to OXYGEN); GHS03

Hazard statements (H) (at least a subset): H280, (Ref. to OXYGEN); H270 (For full text of H-statements: see SECTION 2.1)

Precautionary statements (P) (at least a subset):

P403 : Store in a well-ventilated place

P244 : Keep valves and fittings free from oil and grease

P370+P376 : In case of fire: Stop leak if safe to do so.

(Ref. to OXYGEN):

P220 : Keep/Store away from clothing/.../combustible materials

Supplemental Hazard Information (EU) may be: Not available

- According to DSD-DPD (Directive 67/548/EEC)

Symbol(s) and indication(s) of danger (at least a subset): (Ref. to OXYGEN): O Oxidizing

Risk Phrases (R) (at least a subset): (Ref. to OXYGEN): R8 (For full text of R-phrases: see SECTION 2.1)

Safety phrases (S) (at least a subset):

S2: (If only sold to the general public): keep out of the reach of children

S9: Keep container in a well-ventilated place.

S16: Away from sources of ignition - No smoking.

S23: do not breathe gas/fumes/vapour/spray

S24: avoid contact with skin

S25: Avoid contact with eyes

S36/37: wear suitable protective clothing and gloves

S38: In case of insufficient ventilation wear suitable respiratory equipment

(Ref. to OXYGEN): S17 : Keep away from combustible material

Particular hazards to man and environment: -

2.3 OTHER HAZARDS (may be):

Asphyxiant in high concentrations.

PBT and vPvB assessment: -

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 MIXTURE:

Hazardous ingredients may be: [Composition is referred to ANNEX-ADDITIONAL INFORMATION.xlsx](#)
Contains no other components or impurities which will influence the classification of the product.

4. FIRST AID MEASURES

4.1 DESCRIPTION OF FIRST AID MEASURES:

WARNING BEFORE PREVENTION:

FOLLOWING INHALATION:

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. - Remove victim to uncontaminated area wearing self contained breathing apparatus. - Keep victim warm and rested. - Call a doctor. - Apply artificial respiration if breathing stopped. - Low concentrations may cause increased respiration and headache. - Remove victim to uncontaminated area.

FOLLOWING SKIN CONTACT: (May be): In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

FOLLOWING EYE CONTACT: (May be): Immediately flush eyes thoroughly with water for at least 15 minutes.

FOLLOWING INGESTION: Ingestion is not considered a potential route of exposure.

NOTES FOR THE DOCTOR: -

4.2 MOST IMPORTANT SYMPTOMS AND EFFECT, BOTH ACUTE AND DELAYED:

(Ref. to CARBON DIOXIDE): In high concentrations cause rapid circulatory insufficiency. Symptoms are headache, nausea and vomiting, which may lead to unconsciousness. (Ref. to OXYGEN): - Continuous inhalation of concentrations higher than 75% may cause nausea, dizziness, respiratory difficulty and convulsion.

4.3 INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED:

5. FIRE-FIGHTING MEASURES

5.1 EXTINGUISHING MEDIA:

In confined space use self-contained breathing apparatus.

Suitable extinguishing media: All known extinguishants can be used.

Unsuitable extinguishing media: -

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE:

Specific hazards arising from the chemical: The products are non-flammable. Risk may be caused from fire in the adjacent equipment. Exposure to fire may cause containers to rupture/explode. - If possible, stop flow of product. - Move away from the container and cool with water from a protected position.

Hazardous combustion products: None

6. ACCIDENTAL RELEASE MEASURES

6.1 PERSONAL PRECAUTION, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES:

6.1.1 For non-emergency personnel:

Evacuate area. - Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. - Ensure adequate air ventilation. - Eliminate ignition sources.

6.1.2 For emergency responders:

6.2 ENVIRONMENTAL PRECAUTIONS AND METHODS FOR CONTAINMENT AND CLEANING UP:

Land spillage:

Try to stop release. - People who are not involved with the management of the incident, should evacuate the area. - Use water as spray for dispensing the gases and protecting the personnel who attempt to stop the leak. - The personnel, who is involved in encountering the incident indoors, should carry self-contained breathing apparatus. - Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous

Spillages in water or at sea:

The leakage from a ship at sea is treated according to the Annex of the 1978 Protocol of International Convention 1973 "Prevention of Sea Pollution from Ships" (MARPOL 73/78) and its amendments. - Isolation of leakage from all sources of ignition. - Updating the nearest port, local authorities and the ownership of the ship for the incident.

6.3 METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP:

6.3.1 For containment:

-

6.3.2 For cleaning up:

Ventilate area.

6.3.3 Other information:

-

7. HANDLING AND STORAGE

7.1 PRECAUTIONS FOR SAFE HANDLING:

7.1.1 Protective measures:

Information on safe handling and measures to prevent fire/explosion:

Suck back of water into the container must be prevented. - Do not allow backfeed into the container. - Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. - Contact your gas supplier if in doubt. - Refer to supplier's container handling instructions. - Use no oil or grease. - Open valve slowly to avoid pressure shock. - Keep away from ignition sources (including static discharges). - Ensure adequate ventilation. - Avoid oxygen rich (>21%) atmospheres.

Measures to protect the environment:

-

7.1.2 Advice on general occupational hygiene:

Do not smoke while handling product.

7.2 CONDITIONS FOR SAFE STORAGE:

Technical measures and storage conditions:

Segregate from flammable gases and other flammable materials in store. - Keep container below 50°C in a well ventilated place. - Proper labelling and maintenance of closed containers should be necessary. - Keep away from children. - Grounding of storage and transport systems as well as preventive controls for accidental leaks should be necessary.

Packaging materials:

The storage equipment (cylinder bottles) should be specifically designated for this product and properly grounded. - Prevent the entry of water into the equipment. - Do not allow the reverse flow to the interior.

Requirements for storage rooms and vessels:

Storing the product in well ventilated area, away from sources of heat or any other source that can cause inflammation.

Storage class: 2.2

7.3. SPECIFIC END USE(S):

-

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 CONTROL PARAMETERS:

8.1.1 Occupational Exposure/Biological Limit Values

[Occupational Exposure/Biological Limit Values are referred to ANNEX-ADDITIONAL INFORMATION.xlsx](#)

8.1.2 Information on currently recommended monitoring procedures:

Article 5 of П. 338/2001. Article 10 of П. 338/2001.

8.1.3 Applicable occupational exposure limit values and/or biological limit values for air contaminants (if formed when using the substance/mixture as intended)

[Applicable occupational exposure limit values and/or biological limit values for air contaminants are referred to ANNEX-ADDITIONAL INFORMATION.xlsx](#)

8.1.4 DNEL / PNEC values:

-

8.2 EXPOSURE CONTROLS:

8.2.1 Appropriate engineering controls / Technical measures to prevent exposure:

Appropriate engineering controls:

Especially in confined spaces, before starting any work, the control of the atmosphere with special counters is needed in order to be ensured that there are no gases which can cause asphyxiation.

Organisational measures to prevent exposure:

The design of work processes and organizational measures should be complied with Article 5 of П. 338/2001

- Compliance with the rules for personal hygiene and health surveillance in accordance with Article 10 of П. 338/2001 should be necessary.

8.2.2 Personal protection equipment:

Respiratory protection:



Use of full face masks with combined filters in case of small leakages. In incidents of great release, use self-contained breathing apparatus and full suit (impermeable uniform, boots, gloves).
- CSN EN 136 - Respiratory protective devices - Full face masks - Requirements, testing, marking.
- DIN EN 137 Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.
- BS EN 141:2000 - Respiratory protective devices. Gas filters and combined filters. Requirements, testing, marking

Eye protection:



Use of goggles is necessary for the protection of the eyes.
- Wear goggles with suitable filter lenses when use is cutting/welding.
- CSN EN 166 - Personal eye-protection - Specifications.
- CR13464 - Guide to selection, use and maintenance of occupational eye and face protectors.

Hand protection:



In case of skin contact, the use of neoprene impermeable gloves is necessary.
- DIN EN 374-1 Protective gloves against chemicals and micro-organisms.
- DIN EN 388 Protective gloves against mechanical risks.
- DIN EN 407 Protective gloves against thermal risks (heat and/or fire).
- DIN EN 420 Protective gloves
- General requirements and test methods (includes Amendment A1:2009). Choose the glove material taking into consideration the penetration times, rates of diffusion and the degradation.
Check if the gloves are in good condition before each use.

Skin and body (including hands) protection:



Wear suitable protective clothing and protective boots. During filling of cylinders or in case of contact with the liquid product, the use of impermeable gloves, of suitable protective clothing, goggles or face shields is necessary. Use of safety shoes during handling of propane cylinders. In case of large extent fire, use of fire-persistent uniforms and self-contained breathing equipment is required.
Protective clothing - General requirements.
- BS EN 465:1995 - Protective clothing. Protection against liquid chemicals. Performance requirements for chemical protective clothing with spray-tight connections between different parts of the clothing (type 4 equipment).
- BS EN 466-1:1995 - Protective clothing. Protection against liquid chemicals. Performance requirements for chemical protective clothing with liquid-tight connections between different parts of the clothing (type 3 equipment).
- BS EN 467:1995 - Protective clothing. Protection against liquid chemicals. Performance requirements for garments providing protection to parts of the body. CSN EN 345 Use safety footwear

8.2.3 Environmental exposure controls:

-

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES:

[Physical and chemical properties are referred to ANNEX-ADDITIONAL INFORMATION.xlsx](#)

10. STABILITY AND REACTIVITY

10.1 REACTIVITY:

-

10.2 CHEMICAL STABILITY:

Stable under normal conditions.

10.3 POSSIBILITY OF HAZARDOUS REACTIONS:

-

10.4 CONDITIONS TO AVOID:

Heat sources, bare flames and other ignition sources. - (Ref. to OXYGEN): Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (30 bars) oxygen lines in case of combustion

10.5 INCOMPATIBLE MATERIALS:

May react violently with combustible materials.
- May react violently with reducing agents.

- (Ref. to OXYGEN): Violently oxidises organic material.

- Keep equipment free from oil and grease.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS: None

11. TOXICOLOGICAL INFORMATION

11.1 INFORMATION ON TOXICOLOGICAL EFFECTS:

Acute toxicity: The toxicity of these substances is very low.
Skin corrosion/irritation: Frequent or prolonged contact causes irritation, possible cold burn and dermatitis due to the removal of the protective fat layer of the skin.
Serious eye damage/irritation: Contact with eyes or exposure to high concentrations of vapours causes irritation.
Respiratory or skin sensitisation: Inhalation of vapours causes irritation of the mucous membranes of the respiratory and cough. Exposure to high concentrations, even for a few minutes, causes dizziness, headache, nausea, dizziness.
Germ cell mutagenicity: -
Carcinogenicity: -
Toxicity to reproduction: -
STOT - single exposure: -
STOT - repeated exposure: -
Aspiration hazard: It cannot happen.

12. ECOLOGICAL INFORMATION

12.1 TOXICITY: (Ref. to CARBON DIOXIDE): When discharged in large quantities may contribute to the greenhouse effect.
12.1.1 Aquatic toxicity: The cases of contamination of receiving water are practically impossible.
12.1.2 Sediment toxicity: -
12.1.3 Terrestrial Toxicity: In case of contact of soil with small amounts of the substance, the entire amount is evaporated.

Toxicity to birds: -

12.2 PERSISTENCE AND DEGRADABILITY:

12.2.1 Persistence Assessment: -
12.2.2 Stability: -
Hydrolysis: -
Phototransformation in air: -
Phototransformation in water and soil: -

12.2.3 Biodegradation: -

12.3 BIOACCUMULATIVE POTENTIAL: -

12.4 MOBILITY IN SOIL: -

12.5 RESULTS OF PBT AND vPvB ASSESSMENT: -

13. DISPOSAL CONSIDERATIONS

13.1 WASTE TREATMENT METHODS:

13.1.1 Product / Packaging disposal: If the product must be disposed of/eliminated, this will be conducted with combustion, according to the relative Legislation and the approval of the local authorities.
13.1.2 Waste treatment - relevant information: To atmosphere in a well ventilated place.
13.1.3 Sewage disposal - relevant information: Do not discharge into any place where its accumulation could be dangerous
13.1.4 Other disposal recommendations: Discharge to atmosphere in large quantities should be avoided. - Contact supplier if guidance is required.

13.2 ADDITIONAL INFORMATION: -

14. TRANSPORT INFORMATION

Pictogram(s):



(Ref. to OXYGEN):



LAND TRANSPORT (Road/Rail) according to ADR/RID 2003, ПД 104/99 and its amendments (ФЕК 509B/2000 and 1232B/2001), Directives 94/55/EEC and 96/49/EEC and their amendments:

Transport Hazard Class(es): 2.2
Packing group:

INLAND WATERWAY TRANSPORT (AND(R)):

Transport Hazard Class(es): 2.2
Packing group:

MARINE TRANSPORT according to IMDG – IMO Code 2002 and ПД 405/96:

Transport Hazard Class(es): 2.2
Packing group:

AIR TRANSPORT (ICAO-TII/IATA-DRG):

Transport Hazard Class(es): 2.2
Packing group:

[More details such as environmental hazards \(UN Model Regulations/2009\), limited quantities, packaging and IBCs, portable tanks and bulk containers, special precautions for users about transport information are referred to ANNEX-ADDITIONAL INFORMATION.xls](#)

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

15.1 SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS/LEGISLATION SPECIFIC FOR THE SUBSTANCE OR MIXTURE:

National Regulations: Ensure all national/local regulations are observed.
EU Regulations: -

15.2 CHEMICAL SAFETY ASSESSMENT: -

16. OTHER INFORMATION

KEY LITERATURE REFERENCES AND SOURCE OF DATA:

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.

RELEVANT R-PHRASES AND/OR H-STATEMENTS MAY BE:

None

TRAINING ADVICE:

The information of the present generalized Material Safety Data Sheet can be used for training purposes.
- Asphyxiant in high concentrations.
- Keep container in a well-ventilated place.
- Do not breathe the gas.
- The hazard of asphyxiation is often overlooked and must be stressed during operator training.
- (Ref. to OXYGEN): Ensure operators understand the hazard of oxygen enrichment.