MATERIAL SAFETY DATA SHEET (MSDS)
CLASS 5.1 – OXIDISING SUBSTANCES

1. CHEMICAL PRODUCT IDENTIFICATION

1.1 PRODUCT IDENTIFIER:

This data sheet is about substances and mixtures that are characterized as oxidising substances which are included in Class 5.1, according UNITED NATIONS Committee of Experts on the Transport of Dangerous Goods (UN). An oxidising substance which, while in itself not necessarily combustible, may, generally by yielding oxygen, cause, or contribute to, the combustion of other material.
The following products have been recorded in the present MSDS: Oxygen, aqueous solutions of hydrogen peroxide, perchloric acid, chlorates, etc.

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)

GHS03

_ **Oxidiser:** H270

H270 : May cause or intensify fire; oxidiser.

(May be):  GHS04

- Gas under pressure (Press. Gas): H280
H28**0:** Contains gas cylinder under pressure; may explode if heated

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

_ **Oxidizing**: R8, R2, R9
R8 : Contact with combustible material may cause fire.
R2: Risk of explosion by shock, friction, fire or other sources of ignition.
R9: Explosive when mixed with combustible material.

2.2 LABELLING:

- According to GHS (EC Regulation 1272/2008)

Signal word: **D a n g e r**
Hazard pictograms: GHS03. (May be): GHS04

Hazard statements (H) (at least a subset): H270. (May be): H280 (*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
P220 : Keep/Store away from clothing/…/combustible materials
P370+P376 : In case of fire: Stop leak if safe to do so.

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): O Oxidizing

Risk Phrases (R) (at least a subset): R8, R2, R9 (For full text of R-phrases: see SECTION 2.1)

Safety phrases (S) (at least a subset): S17 : Keep away from combustible material
S2: (If only sold to the general public): keep out of the reach of children
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
S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
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 where possible)
S53: Avoid exposure - obtain special instructions before use
S62: If swallowed, do not induce vomiting: seek medical advice immediately and show this container or label where possible

Particular hazards to man and environment:

2.3 OTHER HAZARDS (may be): None

PBT and vPvB assessment: -

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 MIXTURE: Composition is referred to ANNEX-ADDITIONAL INFORMATION.xlsx

Hazardous ingredients may be: 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: Necessary to isolate the area from all possible sources of ignition. The area where the casualty will be transferred, should be well ventilated.

FOLLOWING INHALATION: - Remove victim to uncontaminated area.
A. **If the casualty is conscious**: Place the casualty in recovery position with legs slightly raised. Loose tight clothing, cover with a blanket. Keep patient warm and at rest. Obtain medical advice.
B. **If the victim is unconscious or conscious but breathes with difficulty**: Seek medical advice immediately. Place the casualty in the recovery position with legs slightly raised. Loose tight clothing and cover with a blanket. Supply oxygen. If necessary, give external cardiac massage.
C. **If the casualty does not breathe**: Give artificial Respiration. Obtain medical advice immediately. Place the casualty in the recovery position with legs slightly raised. Loose tight clothing and cover with a blanket. When the respiration recurs, provide oxygen. If necessary, give external cardiac massage.

FOLLOWING SKIN CONTACT: Remove the casualty from the incident area. Remove clothing. The items that came in contact with the substance should be carefully washed with cold water and soap. If the skin is just dry, carefully spread lanolin ointment. Immediate medical assistance call.

FOLLOWING EYE CONTACT: Remove the casualty from the area of the incident. Wash eyes with copious amount of water for at least 15 min keeping the eyelids open. Remove contact lenses, if there are and it is easy to be removed. Continue to rinse. Do not administer eye drops or other liquid without medical approval. Obtain medical advice – Refer to the specialist if the pain or irritation persists after washing.

FOLLOWING INGESTION: Remove the casualty to a quiet, cool and well ventilated environment.
ATTENTION! Do not induce vomiting (hazard of chemical pneumonitis). Do not give anything to drink. Place the casualty in the recovery position with legs slightly raised. Loose tight clothing and cover with a blanket. Obtain medical advice immediately.

NOTES FOR THE DOCTOR: -

4.2 MOST IMPORTANT SYMPTOMS AND EFFECT, BOTH ACUTE AND DELAYED: - 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: Use of water only for cooling of fire exposed tanks and vessels in order oxidising action of the substance to be avoided.

5.2 SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE:

Specific hazards arising from the chemical: 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.
- 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 leaked quantity should be absorbed in sand or other inert material and be washed with water.
- Prevent from entering sewers.
- Inform local authorities if product is mixed with soil, water or vegetation.

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.
- Leakage is restricted to a limited space, using floating dams.

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.
- Keep away from children.
- Proper labelling (oxidising product) and maintenance of closed containers should be necessary.
- Keep away from children.
- In case of release of high dust concentrations, measurements in the air is required in order to be ensured that maximum exposure is not exceeded. Handling and storage of this substance must take place away from substances which can react with it (in case of leakage) and lead to undesirable situations.

Packaging materials: - The storage equipment should be specifically designated for this product according to relevant legislation in well ventilated areas, away from heating sources or other sources can cause ignition.

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: 5.1

7.3. SPECIFIC END USE(S):

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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 Π. 338/2001. Article 10 of Π. 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 ignite or cause oxygen deficiency.

Organisational measures to prevent exposure:
- The design of work processes and organizational measures should be complied with Article 5 of Π. 338/2001.
- Compliance with the rules for personal hygiene and health surveillance in accordance with Article 10 of Π. 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.
- CSN EN 340 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

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: 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.
- Violently oxidises organic material.
- Keep equipment free from oil and grease.

10.6 HAZARDOUS DECOMPOSITION PRODUCTS: According to the product, it is produced: carbon monoxide and carbon dioxide, nitrogen oxides, sulfur dioxide, oxides of metals, etc.

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.
Serious eye damage /irritation: Contact with eyes causes irritation.
Respiratory or skin sensitisation: Inhalation of vapours causes irritation of the mucous membranes of the respiratory and cough.
Germ cell mutagenicity: -
Carcinogenicity: -
Toxicity to reproduction: -
STOT - single exposure: -
STOT - repeated exposure: -
Aspiration hazard: It is absorbed from the digestive tract and causes irritation.

12. ECOLOGICAL INFORMATION

12.1 TOXICITY:

12.1.1 Aquatic toxicity: Contamination of water receiver does not cause mortality in aquatic organisms due to the absolute solubility of these substances in water.
12.1.2 Sediment toxicity: -
12.1.3 Terrestrial Toxicity: Contamination of soil with large amounts of product may cause penetration of the product into the underground aquifers.
Toxicity to birds: -

12.2 PRESISTENCE 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 by a certified operator, according to the relative Legislation and the approval of the local authorities. Materials which have been contaminated, must be incinerated. Do not discharge into drains.

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):  (May be): 

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

Transport Hazard Class(es): 5.1
Packing group:

INLAND WATERWAY TRANSPORT (AND(R)):

Transport Hazard Class(es): 5.1
Packing group:

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

Transport Hazard Class(es): 5.1
Packing group:

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

Transport Hazard Class(es): 5.1
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. - Ensure operators understand the hazard of oxygen enrichment.