

Item: 580**Content weight: 330g****SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identification**

UFI: V433-60R3-W00M-XTN9

The LPG is a hydrocarbon gas mixture, liquefied

Mixture name: Liquefied petroleum gas
Other names: mixture A, A01, A02, A0, A1, B1, B2, B and C*; LPG; Mixture of Hydrocarbons C3-4;
Propane / Butane mixture;
CAS number: 68476-85-7
EC index: 649-202-00-6
EC number: 270-704-2
UN number: 2037
REACH number: N/A

* HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S such as: MIXTURE A, A01, A02, A0, A1, B1, B2, B and C. For the
aforementioned mixtures, the following names, used in trade, are authorised for the designation of the subject: BUTANE
for mixtures A, A01, A02 and A0, and PROPANE for mixture C.

1.2 Relevant identified uses of the substance or mixture and uses advised against**1.2.1 identified uses relevant**

Main use category: Professional use, industrial use and use by the consumer

Specified use professional / industrial: Use non-dispersive / Use dispersive wide

Use of the substance / mixture: Fuels
Fuels functional fluids
Processing polymers
Propellant Gas

Do not use the product for not designated purposes

Function or category of use: Fuels, aerosol propellants

1.2.2 Discouraged uses

No further information is available

1.3 Details of the supplier of the safety data sheet:

Supplier/distributor
PLEIN AIR INTERNATIONAL SRL
Via Cavo 8/10
41037 Cividale di Mirandola (MO)
Tel.: +39 0535 21334 (from 8.30 to 17.00)
Contact responsible with the SDS: info@pleinaironline.it

1.4 Emergency telephone numbers:

DESCRIPTION	NATION	PHONE
REACH and CLP UK CA Help Desk Health and Safety Executive (HSE)	EN	+44 0151 9515897 / 0151 922 9235

SECTION 2: Hazard identification

2.1 Classification of the substance

The classification of the substance according to Regulation (EC) 1272/2008 [EU-GHS/CLP]

Flam. Gas 1 A H220

Compressed gas (Liq.) H280

2.2 Label elements

The labelling for the substance packed in refillable tank gas cylinders or in non-refillable cartridges according to EN 417, is composed of the following elements **:
Hazard pictogram (CLP):



GHS02

(Flammable Gas, hazard category 1 A)

** The labelling, referring to the articles according to EN 417, is simplified according to the derogation in Annex 1, section 1.3.2.1 to regulation CLP 1272/2008.

Warning (CLP):

Danger

H hazard statements (CLP):

H220- Extremely flammable gas

H280- Contains gas under pressure; may explode if heated

Precautionary statements (CLP):

P102 - Keep out of reach of children.

P210- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P377- Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381- In case of leakage, eliminate all ignition sources.

P410+P403- Protect from sunlight. Store in a well-ventilated place.

2.3 Other hazards

- the accumulation of vapours in confined environments can form explosive mixtures in contact with air, especially in closed environments or inside empty, uncleaned containers;
- the accumulation of vapours in confined environments may cause asphyxiation (due to oxygen deficiency);
- vapours are invisible even if the liquid expansion causes mist in the presence of humid air;
- vapours have higher density than the air and tends to stagnate near the ground,
- contact with the liquid may cause serious injuries to eyes and skin from frostbite;
- The combustion produces CO₂ (carbon dioxide), asphyxiating gas. In the absence of oxygen, due to insufficient ventilation/fume discharge, it can produces CO (carbon monoxide), very toxic gas;
- The strong heating of the container (for example, in case of fire) causes a significant increase in the volume of the liquid and pressure, with the danger of bursting the recipient containing it.

SECTION 3: Composition/information on ingredients

3.1 Substance

Not Applicable

3.2 Mixtures

Ingredients/Ingredient Information:

Liquefied Petroleum Gas

Odorizing

Denaturant

The mixture is mainly composed of Liquefied Petroleum Gas (LPG), consisting of propane, butane and small amounts of other saturated (ethane, isobutane) or unsaturated (propylene and butene) hydrocarbons. However, these products are present in concentrations below the limits prescribed for the mandatory indication in SDS.

Name	Product identification	%	Classification according to Regulation (EC) no. 1272/2008 [EU-GHS/CLP] *
Petroleum gas, liquefied	(CAS number) 68476-85-7 (EC number) 270-704-2 (EU index number) 649-202-00-6	> 99.99	Flam. Gas 1 A, H220 Compressed gas, H280

Note ***: This product contains < 0.1 % w/w of 1,3 butadiene (EINECS 203-450-8). This product must be regarded as non-carcinogenic and non-mutagenic.

The GWP of the substances used is as follows: Propane 3, N-Butane 4, Isobutane 3

The product can also be denatured with 0.1% m/m of trans-1,3,3,3-tetrafluoroprop-1-ene (HFO1234ze) (CAS 29118-24-9 / EINECS 471-480-0) - GWP = 1

SECTION 4: First aid measures

4.1 Description of first aid measures

General first aid measures

None specified

First aid measures in case of inhalation

Gaseous product: If the victim breaths: Lead the patient to fresh air and allow him/her to rest in a warm place and in a safe position. Keep him/her in a safe side position. If breathing is difficult, administer oxygen if possible or carry out assisted breathing. Refer to a physician if the breathing difficulty persists. If the victim is unconscious and does not breathe: check the absence of breathing obstacles and provide artificial respiration by competent personnel. If necessary, perform an external cardiac massage and consult a physician.

First aid measures in case of skin contact

Liquid product: Wash the skin with plenty of water. Consult a physician immediately if irritations, swelling or redness occur and persist. A quick accidental evaporation of the liquid may cause frostbite. In case of signs of frostbite, such as skin whitening or redness or stinging or tingling feeling, do not rub, massage or compress the injured part. Consult a specialised physician or transfer the victim to the hospital.

First aid measures in case of eye contact

Gently rinse with water for several minutes. Remove, if present, contact lenses, if you can easily do it. In case of irritations, blurred eyesight or persistent swelling, consult a specialised physician.

First aid measures in case of ingestion

Liquid product: Not considered a probable ignition source. Frostbite symptoms may occur on the lips and mouth in case of contact with the product in liquid form. Consult immediately a physician.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms/injuries (general indications)

None.

Symptoms/injuries in case of inhalation

The exposure to high concentrations of vapours, especially in closed or insufficiently ventilated environments, may cause respiratory tract irritation, nausea, discomfort and dizziness. The lack of oxygen due to exposure to high concentrations may cause asphyxiation.

Symptoms/injuries in case of skin contact

Contact with the liquid may cause frostbites.

Symptoms/injuries in case of eye contact

Contact with eyes may cause a slight transitory irritation.

Symptoms/injuries in case of ingestion

N/A.

Symptoms/injuries in case of intravenous administration

No information available.

Chronic symptoms

None to report, based on our current knowledge.

Adverse physicochemical, human health and environmental effects

Extremely flammable. Vapours can form a flammable and explosive mixture in case of contact with air. High concentrations of vapours may cause: migraine, nausea, dizziness. A quick accidental evaporation of the liquid may cause frostbite.

4.3 Indication of any immediate medical attention and special treatment needed

Begin immediately artificial respiration if breathing has stopped. Administer oxygen, if necessary.

SECTION 5: Fire fighting measures**5.1 Extinguishing media****Suitable extinguishing media:**

Small-scale fires: carbon dioxide, dry chemical powder, foam. Large-scale fires: foam or water spray. These agents should be used only by properly trained personnel. Other extinguishing gas (according to the regulation).

Unsuitable extinguishing media

Do not use water jets directly on the burning product. Avoid simultaneous use of foam and water on the same surface, water destroys foam.

5.2 Special hazards arising from substance or mixture**Fire hazard**

Extremely flammable.

Explosion hazard

Vapours are heavier than air, spread along ground and for explosive mixtures with air. Heat may cause pressure increase, resulting in the explosion of closed containers, spread of fire and a risk of burns and injuries.

Combustion products

Incomplete combustion may generate a complex mixture of airborne solid and liquid particles and gas, including carbon monoxide and NOx., oxygen compounds (aldehydes, etc.)

5.3 Advice for fire-fighters**Precautionary measures in case of fire**

If safety conditions allow it, stop or contain the leakage at the source. Do not try to extinguish a fire as the product leakage was not blocked or if you are sure of immediate interception.

Firefighting instructions

Remove undamaged containers from the danger area, if possible, do it without endangering. Use water jets to cool the surfaces and containers exposed to flames. If the fire cannot be controlled, evacuate the area.

Special protective equipment for firefighters

In case of fire or in confined or poorly ventilated spaces, wear a full fireproof garment and an self-contained breathing apparatus with full face piece mask operated in a positive-pressure mode.

Other information (firefighting)

In case of fire, do not dispose of residual water, residual product and the contaminated material, but collect them separately and treat them in an appropriate way.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures****General measures to be taken**

If safety conditions allow it, stop or contain the leakage at the source. Avoid direct contact with the released material. Remain in a upwind area. In case of large spills, warn the residents from downwind zones. Eliminate all ignition sources if safety conditions allow it (e.g. electricity, sparks, fires, torches). Use only non-sparking tools. Gas/vapour heavier than air. May accumulate in closed spaces especially at ground level or below it. Proper sensors can be used to detect gas or flammable vapours.

6.1.1 For non-emergency personnel**Protection means**

Please refer to Section 8.

Emergency procedures

Clear the spill area of all non-emergency personnel. Alert the emergency teams. Except cases of small-scale spills, the feasibility of interventions must always be assessed and approved, if possible, by qualified and competent personnel in charge with managing the emergency.

6.1.2 For emergency personnel**Protection means**

Small-scale spills: normal anti-static work clothing is generally suitable. Large-scale spills: full protective clothing resistant to chemical agents and made of anti-static material. Work gloves (preferably long arm gloves) that provide adequate chemical resistance. If contact with the liquefied product is possible or predictable, gloves should be thermally insulated so as to avoid frostbite. Gloves made of PVA (polyvinyl alcohol) are not waterproof and are not adequate for emergency use. Antistatic and anti-slip safety shoes or boots, with chemical resistance. Safety helmet. Protective goggles or face safety devices if splashes or if eye contact is/are possible or predictable. Respiratory protection: A half-mask or a full-face mask fitted with filter(s) for organic vapours (AX) or a self-contained breathing apparatus can be used, according to the extent of the spill and the predictable exposure level. If the situation cannot be fully assessed or if there is a risk of oxygen deficiency, use only a self-contained breathing apparatus.

Emergency procedures

Warn the competent authorities in compliance with the regulations in force.

6.2. Environmental precautions

Avoid discharging the product in sewerage, rivers or other water streams.

6.3. Methods and material for containment and cleaning up**Methods for containment**

Let the product evaporate, favouring its release. Being heavier than air, vapours can spread for significant distances at ground level/ignite/cause source flash-back. Inside buildings or confined spaces, ensure proper ventilation. Water: Spilling the liquid product in water will presumably result in a quick and complete evaporation. Isolate the area and prevent the risk of fire/explosion for boats and other structures, taking into account the wind direction and speed, up to the complete dispersion of the product.

Cleaning methods

None specified.

Other information (accidental release)

Recommended measures are based on the most probable spilling scenarios for this product. Local conditions (wind, air or water temperature, direction and speed of waves and current) can, however, influence significantly the choice of action to follow. Consult however local experts, if necessary.

6.4. Reference to other sections

Please refer to Section 8.

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

Avoid leaks into the atmosphere; Handle the product with closed circuit systems; Work in well-ventilated places; Do not operate in the presence of ignition sources; Use non-sparking tools. Perform the correct earthing of the devices and prevent the accumulation of electrostatic charges during pouring and bottling operations;
For hygienic purposes, it is recommended: Do not eat, drink and smoke in work areas; Wash your hands after use; Remove contaminated clothing and protective equipment before entering eating areas.

Measurement of hygiene

Avoid skin and eye contact. Do not breathe vapors. Use appropriate personal protective equipment if necessary. Keep away from food and beverages. Do not eat, drink or smoke during use.

7.2 Conditions for safe storage, including any incompatibilities.**Storage conditions**

Store in a dry and well-ventilated place. Do not smoke. Keep away from live flames, hot surfaces and ignition sources. Vapours are heavier than air and they can propagate close to ground. Pay special attention to the accumulation in wells and confined spaces.

Incompatible products

Keep away from: strong oxidants.

Storage temperature

≤ 50°C

Storage place

The structure of the storage area, the devices and operational procedures must be compliant with the European, national or local law in force.

Packaging and containers

Keep only in the original container. Keep in suitable, closed and correctly labelled containers. Gas cylinders should not be stored near other gas cylinders containing compressed oxygen. Empty containers may contain combustible product waste. Do not weld, braze, drill, cut or burn empty containers, unless they have not been properly cleaned.

7.3 Special end uses

The storage and handling of the product designed for use with lighters, refills for lighters, aerosols and gas cartridges. The relevant containers must observe ADR regulations, especially the P003 packaging instructions.

SECTION 8: Exposure control/personal protection**8.1 Control parameters**

Limit value for professional exposure

National: N/A

Community: N/A

ACGIH 2018: N.D.

DNEL: N.D.

PNEC: N.D.

Note: For the identification of dangerous contractions for professional inhalation, besides those predicting an exposure damage, in the absence of national or community limit exposure values, for common phrases, please refer to the document ACGIH "Threshold limit value (TLVs) for chemical substances and physical agents & biological exposure indices (BEIs)".

Specific TLV for liquefied petroleum gas (LPG) – previously grouped in the classification "aliphatic hydrocarbons: alkanes [C1-C4]" now removed – have been withdrawn together with the 2013 issue. Critical effects lead to asphyxiation with a specific reference to the "minimum oxygen content" in the inhaled atmospheres.

8.2 Exposure controls

- a) **Technical measures of control:** minimize exposure. Before access to the storage tanks and start any type of intervention in a confined space (e.g. tunnels), perform an adequate drainage, check the atmosphere and check the oxygen content and the flammability
- b) **Protective personal equipment (for industrial or professional purposes):** Protection of the skin and of the hands: Use complete antistatic clothes, adapted to also cover the upper limbs and lower. Use leather gloves/crust and have thermally insulating gloves with protection of the forearm for eventual emergency. In the factory activities, use antistatic protective gloves, conforming to EN 388 for mechanical risks with high abrasion resistance. In the operations for pouring liquid phase, use antistatic protective gloves, with extended protection to the forearm, conforming to EN 388 for mechanical risks with high resistance to abrasion, internally coated with protection from cold burns.



- c) **Eye/face protection:** In case of any possibility of eye contact, wear protective glasses or other protections (FACE SHIELDS). In case, refer to UNI EN 166.
- d) **Guards hands:** In case of any possibility of skin contact, use hydrocarbons resistant gloves, internally panned. Presumably eligible materials: nitrile (NBR) or PVC with a protection index at least equal to 5 (time of permeation ≥ 240 min). If contact with the liquefied product is possible or foreseeable, gloves must be thermally insulated in order to avoid cold burns. Use gloves caring of the conditions and limits described by the manufacturer. Immediately replace gloves if shows cuts, holes or other signs of degradation. In the case, refer to UNI EN 374.
- e) **Protection of skin and body:** Work clothes with long sleeves. For the definition of the characteristics and performance related to work risks, refer to UNI EN 340 and other UNI-EN-ISO STANDARDS APPLICABLE. Antistatic and anti slip safety shoes or boots resistant to chemical agents. Remove contaminated clothes and shoes.
- f) **Respiratory protection:** Independently from the other possible actions (plant adaptation, operating procedures and other means to reduce the workers exposure), indicate the individual protection devices which can be adopted as required. In ventilated rooms or outdoor: in the case of handling the product in the absence of an appropriate vapor containment system, use masks or semi-masks with filter for hydrocarbon vapors (AX). (EN 136/140/145). Filtering apparatus combined (DIN EN 141). In confined environments (e.g. tanks interior): the adoption of respiratory protection devices (semi-masks, masks, breathing apparatus) must be assessed on the basis of the Working activity, duration and intensity of exposure. For the characteristics, refer to DM 02/05/2001. If it is not possible to determine or estimate exposure levels with certain accuracy or if it is possible that verifies a lack of oxygen, only use autonomous breathing apparatus. A large quantity of LPG vapors (liquefied petroleum gas) can create a lack of oxygen in the atmosphere. In this case, only use autonomous breathing apparatus.
- g) **Thermal protection:** None in normal use
- h) **Exposure controls environmental:** Do not release the product in the environment
- i) **Limitations and control of the exposure of consumers:** Must always be handled in a closed system. Ensure an appropriate ventilation.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

A	Physical state****	Gas
B	Colour	Colorless
C	Odour	Specific, unpleasant, persistent. Gas odorant for combustion use or automotive. Mercaptan**** (legal tracer)
D	Melting point/freezing point*****	-187 (propane) and -138 (butane)
E	Boiling point or initial boiling point and boiling range*****	-42 (propane) and -0,5 (butane)
F	Flammability	Flammable Gas.
G	Lower and upper explosion limit*****	Lower: 1.86 ÷ 2.27 Upper: 8.41 ÷ 9.50
H	Flash point*****	- 104 (propane) and - 60 (butane)
I	Auto-ignition temperature*****	+468 (propane) and +405 (butane)
J	Decomposition temperature	Data not available.
K	pH	Neutral
L	Kinematic viscosity	Data not available.
M	Solubility	Negligible
N	Partition coefficient n-octanol/water (log value)	Data not available.
O	Vapour pressure*****	275 – 1500 kPa (40 °C - EN ISO 4256)
P	Density and/or relative density*****	(Butane) 560 – 585 kg/m ³ (15 °C - EN ISO 3993) (Propane) 505 – 530 (15 °C - EN ISO 3993)
Q	Relative vapour density (Kg/m ³ at 15 °C)*****	From 1,86 (propane) to 2,45 (butane)
R	Particle characteristics	Not Applicable

9.2 Other information

9.2.1. Information on physical hazard classes

No additional information available

9.2.2. Other security information

***** Thermic conductivity in liquid phase at 15°C in W/m x °C:	13 x 10 ⁻²
***** Electric conductivity in liquid phase (at 0÷20°C) in Ω-1 x m -1	0,1 ÷ 0,5 x 10 ⁻¹² (propane), 1 ÷ 5 x 10 ⁻¹² (butane)
Suitability of materials:	Dissolves greases and attacks natural rubber Does not corrode metallic materials
***** Critical point, in °C	da +96,5 (propane) a +151 (butane)
VOC content:	≥90% (EU, CH, USA)

Notes:

**** Under standard conditions the mixture is in the gas phase, the information given here refers to the conditions under which the mixture is released for consumption.

***** The MIXTURE shall be characterised by values proportional to the concentrations of butane and propane.

***** Technical Data Book – A.P.I. (2nd edition, 1970).

***** The term 'explosiion limit' is synonymous with 'flammability limit', used outside the European Union

***** Encyclopedie des gaz-ELSVIER (1976)

⁽¹⁾When they do not have a sufficiently strong odour, odour will be added to the LPG in order to allow the olfactory sensing before reaching dangerous concentrations in case of air release. (law no. 1083 of 6th December 1971, and UNI 7133 regulation).

SECTION 10: Stability and reactivity

10.1 Reactivity

It may react in contact with strong oxidising agents.

10.2 Chemical stability

There are no instability conditions.

10.3 Possibility of hazardous reactions

The contact with strong oxidising agents may cause fire hazard, the mixture with strong oxidising agents can generate explosions.

10.4 Conditions to avoid

Avoid the formation of explosive mixtures with air and the contact with any ignition source. Avoid strong heating of products and containers. Avoid violent decompression of recipients with biphasic content as it may generate strong cooling, with temperatures under 0°C. Avoid the contact with strong oxidising agents (oxygen, nitrous oxide, chlorine, fluorine, etc.).

10.5 Incompatible materials

Incompatible with oxidising agents.

10.6 Hazardous decomposition products

There is no evidence of decomposition or degradation possibility. In case of ignition, a gas-air mixture within the flammability limits. Burning with exothermic reaction and production of carbon oxides (CO₂, CO).

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) n. 1272/2008

a) Acute toxicity:

The product is composed of gas at ambient temperature and pressure for which oral and skin toxicity aspects are not considered relevant.

Oral: In compliance with point 2 of annex XI to REACH regulation, such study should not be performed as the petroleum gas is flammable at ambient temperature and able to form explosive mixtures in contact with air. A high risk of fire and explosion will be associated with any test with significant concentrations.

Inhalation: Hereinafter, a synthesis of the most representative studies is presented. These results do not lead to any classification according to the regulation on dangerous substances.

Method	Results	Comments	Source
By inhalation			
RAT Inhalation	LC50 (15 minutes): 800,000 ppm (males/females) LC50 (15 minutes): 14,442,738 mg/m ³ (M/F) LC50 (15 minutes): 1,443 mg/ml (M/F)	Key study Propane	Clark DG and Tiston DJ (1982)
Human studies General population	The odour is not detectable under 20,000 ppm (2%) and a concentration of 100,000 ppm (10%) has caused slight irritations of the eyes, nose and respiratory tract, but it has caused minor dizziness in a few minutes.	Weight of evidence	Anon 1982 Herman (Chairman 1966)

Cutaneous: In compliance with point 2 of annex XI to REACH regulation, such study should not be performed as the petroleum gas is flammable at ambient temperature and able to form explosive mixtures in contact with air. A high risk of fire and explosion will be associated with any test with significant concentrations.

b) Skin corrosion/irritation:

In compliance with point 2 of annex XI to REACH regulation, such study should not be performed as the petroleum gas is flammable at ambient temperature and able to form explosive mixtures in contact with air. A high risk of fire and explosion will be associated with any test with significant concentrations. A few dose-response studies performed on humans prove that propane and butane do not have corrosive and irritant effects for the skin and mucous membranes. Contact with the liquefied gas may cause frostbites.

c) Serious eye damage/irritation:

In compliance with point 2 of annex XI to REACH regulation, such study should not be performed as the petroleum gas is flammable at ambient temperature and able to form explosive mixtures in contact with air. A high risk of fire and explosion will be associated with any test with significant concentrations.

d) Respiratory or skin sensitisation:

Respiratory sensitisation

There are no studies available which indicate this type of effect

Skin sensitisation

In accordance with point 2 of Annex XI to REACH Regulation, this study should not be performed.

e) Germ cell mutagenicity

No evidence of genotoxicity for most of LPG components. Moreover, the product contains benzene, and 1,3-butadiene in C <0.1%, therefore, it is not classified as a mutagen according to the regulations on dangerous substances.

Hereinafter, a synthesis of the most representative studies from the Registration file is presented.

Method	Results	Comments	Source
Vitro test Ames test in Salmonella strains OECD TG 471	Negative	Key study Methane	National Toxicology Program (1993)
Vitro test Ames test in Salmonella typhimurium OECD TG 471	Negative	Key study Propane	Kirwin CJ and Thomas WC (1980)
Vivo test Micronucleus test RAT Inhalation OECD Guideline 474	Negative	Key study LPG	Huntingdon Life Sciences (HLS) (2009b)

f) Carcinogenicity

No evidence of carcinogenicity for most of LPG components. Moreover, the product contains benzene, and 1,3-butadiene in C <0.1%, therefore, it is not classified as a carcinogen according to the regulations on dangerous substances.

g) Reproductive toxicity

Reproductive toxicity:

Hereinafter, a synthesis of the most representative studies is presented. Most studies have shown no consistent evidence of toxicity to fertility, therefore the product is not classified as toxic for reproduction according to the regulation on dangerous substances.

Method	Results	Comments	Source
Vivo study RAT Inhalation exposure 13 weeks, 6 h/day, 5 days/week) OECD Guideline 413 EPA OPPTS 870.3465	NOAEC: 10,000 ppm (M/F) No effect on the menstruation, spermatogenesis, sperm mobility and count.	Key study LPG	Huntingdon Life Sciences (HLS) (2009b)

Pre-natal developmental toxicity/teratogenicity:

Hereinafter, a synthesis of the most representative studies is presented. Most studies have shown no consistent evidence of toxicity to pre-natal development/teratogenicity for the main components of LPG. Moreover, the product does not contain carbon dioxide in concentration higher than 0.2%, however, it is not classified as toxic for the reproduction according to the regulation on dangerous substances.

Method	Results	Comments	Source
Vivo study RAT Inhalation exposure M: 2 weeks before mating 28 days (minimum) after mating F: 2 weeks before mating 0-19 days of gestation 6 h/day, 5 days a week. Concentrations: 0, 1,600, 5,000 and 16,000 ppm OECD Guideline 422 EPA OPPTS 870.3650	NOAEC (maternal toxicity): 16,000 ppm (no effect of systemic toxicity at the highest tested concentration) NOAEC (maternal toxicity): 19,678 mg/m ³ air NOAEC (pre-natal development toxicity): 16,000 ppm (no effect on pre-natal development) NOAEC (pre-natal development toxicity): 19,678 mg/m ³ air	Key study Ethane (read- across)	Huntingdon Life Sciences (HLS) (2010a)

h) Specific target organ toxicity (STOT) - individual exposure:

No information available

i) Specific target organ toxicity (STOT) - repeated exposure:

Oral:

In compliance with point 2 of annex XI to REACH regulation, such study should not be performed as the petroleum gas is flammable at ambient temperature and able to form explosive mixtures in contact with air. A high risk of fire and explosion will be associated with any test with significant concentrations.

Cutaneous:

In compliance with point 2 of annex XI to REACH regulation, such study should not be performed as the petroleum gas is flammable at ambient temperature and able to form explosive mixtures in contact with air. A high risk of fire and explosion will be associated with any test with significant concentrations.

Inhalation:

Propane: In a 6-week study conducted on male and female rats, no neurological, haematological or clinical effects were observed. At doses of 12,000 ppm, male animals have shown a 25% weight decrease during the first week of exposure. The lowest concentration at which adverse effects were observed (LOAEC) in this study is 12,000 ppm (equivalent to 21,641 mg/m³).

j) Aspiration hazard:

N/A.

Other information

No further information available

SECTION 12: Ecological information

No data available measured for the endpoints of the aquatic toxicity and no PNEC(S) have been derived for fresh water, sea water, sediments and soil. In compliance with column 2 of REACH, annexes VII and VIII, acute toxicity tests should not be performed if there are mitigating factors indicating that aquatic toxicity is improbable. This product is composed of gaseous substances at standard temperature and pressure, which are mainly released into the atmosphere rather than in water, sediments and soil.

12.1 Toxicity

Hereinafter, a synthesis of the most representative studies is presented.

Endpoint	Results	Comments
Aquatic toxicity		
Invertebrates Daphnia Short term	LC50 48/h: 14.22 mg/l	Key study CAS 106-97-8 (Butane) USEPA OPP (2008)
Fish Short term	L50 96/h: 24.11 mg/l	Key study CAS 106-97-8 (Butane) QSAR EPA 2008

12.2 Persistence and degradability

Abiotic degradability

This product can contribute to the formation of ozone in the atmosphere near the surface. However, the photo-chemical ozone formation depends on a complex interaction of other air pollutants and environmental conditions.

Biotic degradability:

QSAR studies have been conducted with ethane, which has a 100% biodegradability within 16 days. Ethane is not a component of the petroleum gas, but its structure is representative of the stream, and a read-across is possible, therefore based on what has been stated above, the product is biodegradable.

12.3 Bioaccumulation potential

The log Pow for LPG is estimated within the range 1.09-2.8, however, the product is not bioaccumulative.

12.4 Mobility in soil

Koc absorption: the standard tests for this endpoint have not been applied to UVCB substances

12.5 Results of the PBT and vPvB assessment

The data show that the properties of the product do not meet the specific criteria detailed in Annex XIII or do not allow a direct comparison with all the criteria set out in Annex XIII, but, however it indicates that the product does not have such properties, so it is not considered a PBT/vPvB.

12.6 Endocrine-disrupting properties

Not applicable to LPG

12.7 Other adverse effects

Not present.

SECTION 13: Disposal considerations

13.1 Waste treatment method

Procedure for waste treatment:

The product as such is not specifically regulated. Dispose of empty containers and waste safely.

Disposal recommendations: The cartridges must be disposed properly empty, in according to the provisions of your municipality. The user has the final responsibility to choose the EWC-code more appropriate, on the basis of the actual use of the product and any alterations or contamination.

More information: the empty containers can contain combustible residues of product. Do not puncture, cutting, grinding, welding, soldering, burn or incinerate the containers or the empty drums not reclaimed. Dispose of empty containers not reclaimed in safety conditions.

Ecology - Waste: such a product does not contain halogenated compounds

SECTION 14: Transport information

14.1 UN number 2037

14.2 UN proper shipping name Receptacles, small, containing gas (gas cartridges), without a release device, nonrefillable

14.3 . Transport hazard class(es)

Class 2
Classification code 5F
Hazard labels 2.1



14.4 Packing group not applicable

14.5 Environmental hazards: Sea transport is subject to IMDG regulations, Division 2.1, recorded under UN 2037. The substance is not dangerous for the environment. Air transport is subject to ICAO / IATA regulations, division 2.1, recorded under UN 2037.

14.6 Special precautions for user

Before the transport of gas cylinders: make sure that the load is well insured.

14.7 Transport in bulk according to IMO

Not relevant.

SECTION 15: Regulatory information

15.1 Legislative and regulatory provisions on health, safety and environment specific for the substance or mixture:

Legislative Decree no. 105 of 26th June 2015 "Implementation of directive 2012/18/EU concerning the control on major-accident hazards related to dangerous substances"

M.D. of 13th October 1994 "Technical fire prevention regulation for the design, construction, installation and operation of LPG deposits from fixed tanks of an overall capacity of over 5 m³ and/or from mobile recipients of an overall capacity over 5,000 kg", with subsequent amendments and additions. (Min. of Interior);

Decree of 14th May 2004 "Technical fire prevention regulation for the installation and operation of LPG deposits with an overall capacity not higher than 13 m³", as amended by the decree of 4th March 2014 (Min. of Interior)

Circular of 20th September 1956, no. 74 of the Ministry of Interior, for the following parts:

- 1) Second part of "Safety standards for the construction and operation of LPG tank deposits, up to 5,000 kg"
- 2) Third part of "Safety standards for the resale of LPG, up to 75 kg"
- 3) Fourth part "Safety standards for centralised LPG tank distribution systems, for civil uses, up to 2,000 kg"

Legislative Decree no. 78 of 12th June 2012, "Implementation of Directive 2010/35/EU, on transportable pressure equipment repealing the Directives 76/767/EEC, 84/525/EEC, 84/526/EEC, 84/527/EEC and 1999/36/EC."

15.2 Chemical safety assessment

Not applicable.

SECTION 16: Other information

The data is based on the present state of our knowledge, however, it does not represent any guarantee of the properties of the product and it does not establish a legally valid contractual relationship.

Indication of modifications:

All sections have been updated. Format according to COMMISSION REGULATION (EU) 2020/878.

NdR- ATTENTION:

- Carc classifications. 1B and Muta. 1B is not required under Note K for substances containing less than 0.1% of 1,3-Butadiene by W/W. If the substance is not classified as carcinogenic or mutagenic, the precautionary statements (P102-) P210- P403 must at least be included.
- As a consequence of the above, this MSDS describes only substances not classified as carcinogenic and mutagenic.

The workers must be informed, trained and instructed according to their specific tasks, according to the relevant legal provisions. Hereinafter, we present the most important legal provisions and technical rules containing the related provisions.

Contact: Technical Office

Abbreviations and acronyms:

RID: Regulation concerning the international carriage of dangerous goods by rail;

ICAO: International Civil Aviation Organisation

ADR: Agreement concerning the international carriage of dangerous goods by road;

IMDG: International Maritime Dangerous Goods Code;

IATA: International Air Transport Association;

GHS: Globally Harmonised System of Classification and Labelling of Chemicals;

VOC: Volatile organic compounds;

LC50: Median lethal concentration (Concentration of substance detected as lethal for 50% of organisms used in a toxicity test for certain exposure time);

LD50: Median lethal dose (dose of a substance, administered only once, able to kill 50% (i.e. half) of a sampling population of animals).

Data sources:

This Safety Data Sheet is based on the characteristics of the components / additives, according to the information provided by the original suppliers.

Professional training tip:

Provide adequate training to professional operators for the use of Personal Protective Equipment (PPE), based on the information contained in this safety data sheet.

Other information:

Do not use the product for purposes other than those indicated by the manufacturer.

Container under pressure: Protect against sunlight and do not expose to temperatures exceeding 50°C. Do not perforate or burn, even after use. Do not spray on a flame or an incandescent body.

The information from this sheet refer only to the identified product and may not be of relevance if the product is used in combination with other products or for other uses than the intended ones.

Downstream users and the distributors to whom this Sheet is intended should have at disposal their own material safety data sheet based on the relevant scenarios and information.

Item: 571

Content weight: 145g (110l)

SECTION 1: Substance/mixture and company identification

1.1 Product identification

Trade name	OXYGEN
Synonym	--
CAS n°	7782-44-7
EINECS n°	231-956-9
Number of the substance	008-001-00-8
Number of registration	Listed in Annex IV/V REACH, exempted from registration
Product form:	Substance
Chemical formula	O ₂

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Industrial and professional uses. Perform risk assessment prior to use.

Uses advised against: None.

1.3 Details of the supplier of the safety data sheet:

Fornitore / Distributore:
KEMPER SRL
Via Prampolini 1/Q, 43044 Lemignano di Collecchio (PR)
Tel.: +39 0521-957111 (dalle 8.30 alle 17.00)
Contatto responsabile delle SDS: info@kempergroup.it

1.4 Numbers of the main poison information centres:

DESCRIPTION	NATION	TELEPHONE
REACH and CLP UK CA Help Desk Health and Safety Executive (HSE)	EN	+44 0151 9515897 / 0151 922 9235

SECTION 2: Hazard identification

2.1 Classification of the substance

The classification of the substance according to Regulation (EC) 1272/2008 [EU-GHS/CLP]

Physical hazards: Oxidising Gases, Category 1 H270

Gases under pressure: Compressed gas H280

2.2 Label elements

Hazard pictograms (CLP):



GHS03

GHS04

Signal word (CLP):

Danger

Hazard statements (CLP):

H270 - May cause or intensify fire; oxidiser.

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

Precautionary statements (CLP)

- Prevention:

P220 - Keep away from clothing and other combustible materials.

P244 - Keep valves and fittings free from oil and grease.

- Response:

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

- Storage:

P410 + P403 Store in a well-ventilated ventilated and protect from sunlight.

2.3 Other hazards

Not classified as PBT or vPvB.

The substance/mixture has no endocrine disrupting properties.

SECTION 3: Composition/information on ingredients**3.1 Substance**

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Oxygen	CAS-No.: 7782-44-7 EC-No.: 231-956-9 EC Index-No.: 008-001-00-8 REACH registration No: *1	100	Ox. Gas 1, H270 Press. Gas (Comp.), H280

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

*1: Listed in Annex IV / V REACH, exempted from registration.

*3: Registration not required: Substance manufactured or imported < 1t/y.

3.2 Mixtures

Not applicable

SECTION 4: First aid measures**4.1 Description of first aid measures**

Inhalation : Remove victim to uncontaminated area.
Skin contact : Adverse effects not expected from this product.
Eye contact : Adverse effects not expected from this product.
Ingestion : Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

Continuous inhalation of concentrations higher than 75% may cause nausea, dizziness, respiratory difficulty and convulsion.

See section 11.

4.3 Indication of any immediate medical attention and special treatment needed

None.

SECTION 5: Fire fighting measures**5.1 Extinguishing media**

Suitable extinguishing media : Water spray or fog.
Product does not burn, use fire control measures appropriate for the surrounding fire.

Unsuitable extinguishing media : Do not use water jet to extinguish.

5.2 Special hazards arising from substance or mixture

Specific hazards : Supports combustion.
Exposure to fire may cause containers to rupture/explode.

Hazardous combustion products : None.

5.3 Advice for fire-fighters**Specific methods:**

Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. If possible, stop flow of product. Use water spray or fog to knock down fire fumes if possible. Move containers away from the fire area if this can be done without risk.

Special protective equipment for fire fighters:

Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 469 -
Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures****For non-emergency personnel:**

Act in accordance with local emergency plan.
Try to stop release.
Evacuate area.
Eliminate ignition sources.
Ensure adequate air ventilation.
See section 8 of the SDS for more information on personal protective equipment

For emergency responders:

Monitor concentration of released product.
Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
See section 5.3 of the SDS for more information.

6.2. Environmental precautions

Try to stop release.

6.3. Methods and material for containment and cleaning up

Ventilate area.

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage**7.1 Precautions for safe handling**

Safe use of the product :

Use no oil or grease. 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 smoke while handling product. Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at <http://www.eiga.eu>. Use only oxygen approved lubricants and oxygen approved sealings. Avoid suck back of water, acid and alkalis. Only experienced and properly instructed persons should handle gases under pressure. Ensure the complete gas system was (or is regularly) checked for leaks before use. Use only with equipment cleaned for oxygen service and rated for container pressure. The product must be handled in accordance with good industrial hygiene and safety procedures. Consider pressure relief device(s) in gas installations. Do not breathe gas.

Safe handling of the gas receptacle :

Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect containers from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. If user experiences any difficulty operating valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the content of the container. Suck back of water into the container must be prevented. Open valve slowly to avoid pressure shock.

7.2 Conditions for safe storage, including any incompatibilities.

Segregate from flammable gases and other flammable materials in store.
Observe all regulations and local requirements regarding storage of containers.
Containers should not be stored in conditions likely to encourage corrosion.
Containers should be stored in the vertical position and properly secured to prevent them from falling over.
Keep container below 50°C in a well ventilated place.
Store containers in location free from fire risk and away from sources of heat and ignition.
Keep away from combustible materials.

SECTION 8: Exposure control/personal protection

8.1 Control parameters

OEL (Occupational Exposure Limits) : None available.

DNEL (Derived-No Effect Level) : None available.

PNEC (Predicted No-Effect Concentration) : None available.

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Avoid oxygen rich (>23,5%) atmospheres.
Gas detectors should be used when oxidising gases may be released.
Provide adequate general and local exhaust ventilation.
Consider the use of a work permit system e.g. for maintenance activities.
Systems under pressure should be regularly checked for leakages.

8.2.2 Individual protection measures, e.g. personal protective equipment

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered:
PPE compliant to the recommended EN/ISO standards should be selected.

Eye/face protection:

Wear safety glasses with side shields. Standard EN 166 - Personal eye-protection - specifications.

Skin protection

Hand protection: Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk, performance level 1 or higher.

Other: Consider the use of flame resistant safety clothing. Standard EN ISO 14116 - Limited flame spread materials.
Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

Respiratory protection: None necessary. Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

Thermal hazards: None in addition to the above sections.

8.2.3 Environmental exposure controls

Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties**

Appearance

- Physical state at 20°C / 101.3kPa:

Gas.

- Colour:

Colourless.

Odour:

No odour warning properties.

Odour threshold is subjective and inadequate to warn of overexposure.

Melting point / Freezing point:

-219 °C

Boiling point:

-183 °C

Flammability:

Non flammable.

Lower explosive limit (LEL):

Not available.

Upper explosive limit (UEL):

Not available.

Flash point:

Not applicable for gases and gas mixtures.

Auto-ignition temperature:

Non flammable.

Decomposition temperature:

Not applicable.

pH:

Not applicable for gases and gas mixtures.

Viscosity, kinematic:

No reliable data available.

Water solubility [20°C]:

39 mg/l

Partition coefficient n-octanol/water (Log Kow):

Not available.

Vapour pressure [20°C]:

Not applicable.

Vapour pressure [50°C]:

Not applicable.

Density and/or relative density:

Not applicable.

Relative vapour density (air=1):

1,1

Particle characteristics:

Not applicable for gases and gas mixtures.

9.2 Other information**9.2.1. Information with regard to physical hazard classes**

Explosion limits:

Non flammable.

Oxidising properties:

Oxidiser.

- Coefficient of oxygen equivalency (Ci):

1

Critical temperature [°C]:

-118 °C

9.2.2. Other safety characteristics

Molar mass:

32 g/mol

SECTION 10: Stability and reactivity**10.1 Reactivity**

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Violently oxidises organic material.

10.4. Conditions to avoid

Avoid moisture in installation systems.

10.5. Incompatible materials

Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at <http://www.eiga.eu>. Consider the potential toxicity hazard due to the presence of chlorinated or fluorinated polymers in high pressure (> 30 bar) oxygen lines in case of combustion.

May react violently with combustible materials. May react violently with reducing agents. For additional information on compatibility refer to ISO 11114.

10.6. Hazardous decomposition products

None.

SECTION 11: Toxicological information**11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**

Acute toxicity:	No known toxicological effects from this product.
Skin corrosion/irritation:	No known effects from this product.
Serious eye damage/irritation:	No known effects from this product.
Respiratory or skin sensitisation:	No known effects from this product.
Germ cell mutagenicity:	No known effects from this product.
Carcinogenicity:	No known effects from this product.
Toxic for reproduction: Fertility:	No known effects from this product.
Toxic for reproduction: unborn child:	No known effects from this product.
STOT-single exposure:	No known effects from this product.
STOT-repeated exposure:	No known effects from this product.
Aspiration hazard:	Not applicable for gases and gas mixtures.

11.2. Information on other hazards

Other information: The substance/mixture has no endocrine disrupting properties.

SECTION 12: Ecological information**12.1. Toxicity**

Assessment: No ecological damage caused by this product.

EC50 48h - Daphnia magna [mg/l]: No data available.

EC50 72h - Algae [mg/l]: No data available.

LC50 96 h - Fish [mg/l]: No data available.

12.2. Persistence and degradability

Assessment: No ecological damage caused by this product.

12.3. Bioaccumulative potential

Assessment: No ecological damage caused by this product.

12.4. Mobility in soil

Assessment: No ecological damage caused by this product.

12.5. Results of PBT and vPvB assessment

Assessment: Not classified as PBT or vPvB.

12.6. Endocrine disrupting properties

The substance/mixture has no endocrine disrupting properties.

12.7. Other adverse effects

Other adverse effects: No known effects from this product.

Effect on the ozone layer: No effect on the ozone layer.

Effect on global warming: None.

SECTION 13: Disposal considerations

13.1 Waste treatment method

May be vented to atmosphere in a well ventilated place.

Contact supplier if guidance is required.

Ensure that the emission levels from local regulations or operating permits are not exceeded.

Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.eu> for more guidance on suitable disposal methods.

Do not discharge into any place where its accumulation could be dangerous.

Cylinders are not refillable containers. If the cylinder must be taken out of use, ask the manufacturer/distributor for information on proper disposal.

List of hazardous waste codes (from Commission Decision 2000/532/EC as amended)

: 16 05 04 *: Gases in pressure containers (including halons) containing hazardous substances.

13.2. Additional information

External treatment and disposal of waste should comply with applicable local and/or national regulations.

SECTION 14: Transport information

14.1. UN number or ID number

In accordance with ADR / RID / IMDG / IATA / ADN

UN-No.: 1072

14.2. UN proper shipping name

Transport by road/rail (ADR/RID):

OXYGEN, COMPRESSED

Transport by air (ICAO-TI / IATA-DGR):

not expected

Transport by sea (IMDG):

OXYGEN, COMPRESSED

14.3. Transport hazard class(es)

Labelling :

2.2: Non-flammable, non-toxic gases.

5.1: Oxidizing substances.

Transport by road/rail (ADR/RID)

Class:

2

Classification code:

10

Hazard identification number:

25

Tunnel Restriction:

E - Passage forbidden through tunnels of category E

Transport by sea (IMDG)

Class / Div. (Sub. risk(s)):

2.2 (5.1)

Emergency Schedule (EmS) - Fire:

F-C

Emergency Schedule (EmS) - Spillage:

S-W

14.4. Packing group

Transport by road/rail (ADR/RID):

Not applicable

Transport by sea (IMDG):

Not applicable

14.5. Environmental hazards

Transport by road/rail (ADR/RID):

None.

Transport by sea (IMDG):

None.

14.6. Special precautions for user

Packing Instruction(s)

Transport by road/rail (ADR/RID):

P200

Transport by sea (IMDG):

P200

Special transport precautions:

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 there is adequate ventilation.
- Ensure that containers are firmly secured.

14.7. Maritime transport in bulk according to IMO instruments

Not applicable.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU-Regulations

Restrictions on use: None.

Other information, restriction and prohibition regulations: Not listed on the PIC list (Regulation EU 649/2012).

Seveso Directive: 2012/18/EU (Seveso III): Listed.

National regulations

Regulatory reference: Ensure all national/local regulations are observed.

15.2. Chemical safety assessment

A CSA does not need to be carried out for this product.

SECTION 16: Other information

The data is based on the present state of our knowledge, however, it does not represent any guarantee of the properties of the product and it does not establish a legally valid contractual relationship.

Indication of modifications:

All sections have been updated. Format according to COMMISSION REGULATION (EU) 2020/878.

The workers must be informed, trained and instructed according to their specific tasks, according to the relevant legal provisions. Hereinafter, we present the most important legal provisions and technical rules containing the related provisions.

Contact: Technical Office

Abbreviations and acronyms :

ATE - Acute Toxicity Estimate

CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008

REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006

EINECS - European Inventory of Existing Commercial Chemical Substances

CAS# - Chemical Abstract Service number

PPE - Personal Protection Equipment

LC50 - Lethal Concentration to 50 % of a test population

RMM - Risk Management Measures

PBT - Persistent, Bioaccumulative and Toxic

vPvB - Very Persistent and Very Bioaccumulative

STOT- SE : Specific Target Organ Toxicity - Single Exposure

CSA - Chemical Safety Assessment

EN - European Standard

UN - United Nations

ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road

IATA - International Air Transport Association

IMDG code - International Maritime Dangerous Goods

RID - Regulations concerning the International Carriage of Dangerous Goods by Rail

WGK - Water Hazard Class

STOT - RE : Specific Target Organ Toxicity - Repeated Exposure

UFI : Unique Formula Identifier

Training advice : Ensure operators understand the hazard of oxygen enrichment.

Further information : Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP).

Key literature references and sources of data are maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at <http://www.Eiga.eu>.

The information from this sheet refer only to the identified product and may not be of relevance if the product is used in combination with other products or for other uses than the intended ones.

Downstream users and the distributors to whom this Sheet is intended should have at disposal their own material safety data sheet based on the relevant scenarios and information.