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Impianto produttivo: Via Zuccherificio 622 - 45031 Arquà Polesine (RO) – Tel. +39 0425/91007
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This Safety Data Sheet is available for professional users.

Safety Data Sheet revision No. 09 of 23/04/2025 replaces safety data sheet issue in 07/11/2022 (rev. 08)

| SECTION 1 - Identification of the substance/mixture and of the company/undertaking

1.1 - Product identifier:

1.1.1	Chemical product:	**Substance**
1.1.2	Trade name:	**ISOBUTANE; GTS POLARPURE R600a; GTS POLARPURE R600a 2.5; GTS POLARPURE R600a 3.0; GTS POLARPURE R600a 3.5; GTS SPRAY ISOBUTANO; GTS SPRAY ISOBUTANO 2.0; GTS SPRAY ISOBUTANO 2.5**
1.1.3	REACH Registration number:	01-2119485395-27-xxxx
1.1.4	EINECS No.:	601-004-00-0
1.1.5	CE No.:	200-857-2
1.1.6	CAS No.:	75-28-5

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

1.2.1 Main sector of use:

- **Industrial use:**

Manufacture of substance (ERC1, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15)
Formulation & (re)packing of Substances and Mixtures (ERC2, PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15)
Use as an intermediate (ERC6a, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC15)
Use as a blowing agent (ERC4, PROC1, PROC2, PROC3, PROC8b, PROC9, PROC12)
Use a fuel (ERC7, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16)
Use a functional fluid (ERC7, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC9)
Polymer production (ERC4, ERC5, PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC9, PROC13, PROC14)
Polymer processing (ERC4, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16, PC32)

- **Professional use:**

Use a fuel (ERC9a, ERC9b, PROC1, PROC2, PROC3, PROC4, PROC8a, PROC8b, PROC16)
Use a functional fluid (ERC9a, ERC9b, PROC1, PROC2, PROC3, PROC8a, PROC9, PROC20)
Polymer processing (ERC8a, ERC8d, PROC1, PROC2, PROC3, PROC4, PROC5, PROC6, PROC8a, PROC8b, PROC14, PROC21)
Use a propellants (ERC8a, ERC8d, PROC11)

- **Consumer use:**

Use a fuel (ERC9a, ERC9b, PC13)
Use a propellants (ERC8a, PC1, PC2, PC3, PC4, PC31, PC35, PC39)

1.2.2 Uses advised against: **Recommended use are listed above. Other uses are not recommended unless an assessment has provided that risks are controlled.**

1.3 - Details of the supplier of the safety data sheet:

GTS SPA
Via Zuccherificio 622
45031 Arquà Polesine (RO) - Italy

Telephone number:	+39 0425/91007
Fax number:	--
Email address:	info@gtsspa.com
Expert e-mail address:	info@stelgasystem.com
Internet website:	www.gtsspa.com/it

1.4 - Emergency number: +39 0425/91007 (office hours)

Poison Control Centre:
C.N.I.T. - Pavia
Tel.+39 0382-24444
(see section 16 for the complete list of the International poison control centres)

| SECTION 2 - Hazards identification

2.1 – Classification of the substance or mixture

2.1.1 Classification according to Regulation (EC) No. 1272/2008

Classification	Flammable gas Category 1A	Gas under pressure
GHS pictograms	 GHS02	 GHS04
Warning	Hazard	Warning
Hazard statement	H220: Extremely flammable gas	H280: Contains gas under pressure; may explode if heated

2.2 – Label elements

2.2.1 Labelling according to Regulation (EC) No. 1272/2008
Labelling for the substance packed in refillable cylinders or in non-refillable cartridges within the scope of EN 417 shall consist of the following elements *:

Classification	Flammable gases Category 1A	Gas under pressure*
GHS pictograms	 GHS02	 GHS04*
Warning	Hazard	
Hazard statement	H220: Extremely flammable gas	H280: Contains gas under pressure; may explode if heated
Precautionary statement - Prevention	**P210:Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.**	
Precautionary statement - Response	**P377:Leaking gas fire: Do not extinguish, unless leak can be stopped safely** **P381:In case of leakage, eliminate all ignition sources**	
Precautionary statement - Storage	**P410+P403:Protect from sunlight. Store in a well-ventilated place**	
Precautionary statement - Disposal	**P501:Dispose of contents/container to in accordance with local/regional/national/ international regulation**	

If product is for Consumer retail must be added following precautionary statement - general statements:
P102: Keep out of reach of children
P103: Read label before use

Additional Recommended Phrases:
- Use away from possible sparks, flames, heat sources, electrical equipment in operation
- In insufficiently ventilated environments, the formation of explosive mixtures is possible

NOTES:
*** Labelling is simplified** by virtue of the derogation Annex 1, Section 1.3.2.1 of Regulation 2019/521 thereof:
if propane, butane and liquefied petroleum gas or a mixture containing these substances classified in accordance with the criteria of this Annex, is placed on the market in closed refillable cylinders or in non-refillable cartridges within the scope of EN 417 as fuel gases which are only released for combustion (current edition of EN 417, relating to "Non-refillable metallic gas cartridges for liquefied petroleum gases, with or without a valve, for use with portable appliances; construction, inspection, testing and marking"), **these cylinders or cartridges need be labelled only with the appropriate pictogram and the hazard and precautionary statements concerning flammability**.'

The most important precautionary statements indicated by the supplier are highlighted in bold, those not highlighted are optional. As foreseen by art. 28 par. 3 of Regulation (EC) no. 1272/2008, no more than six precautionary statements shall be indicated.

CONTAINS: ISOBUTANE.
CAS No.: 75-28-5

2.3 - Other hazards

HEALTH RISKS: Simple asphyxiating gas under normal conditions of temperature and pressure. At high concentrations, the vapours can be irritating to the respiratory system. Storage containers and delivery lines may also become cold enough to present a cold burns hazard. Any substance, in case of accidents involving pressurized circuits and the like, may be accidentally injected under the skin, even without external damage. In such a case, the casualty should be brought to an hospital as soon as possible, to get specialized medical treatment.

PHYSICAL AND CHEMICAL HAZARDS/FIRE AND EXPLOSION HAZARD: The product may charge electrostatically: use earthing leads when transferring from one container to another. Gas/air mixtures are explosive. The product is heavier than air and in the event of a leak, vapour may accumulate in confined spaces and low lying areas where it may easily be accidentally ignited.

Results of PBT and vPvB assessment
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII.
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII.

Endocrine disrupting properties
The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

Substances of very high concern (SVHC)
The product does not contain substances listed in Annex XIV of REACH Regulation (SVHC-update of 21/01/2025); does not contain substances with authorization (Annex XIV).

| SECTION 3 - Composition/Information on ingredients

3.1 - Substances

Substances	Registration No.	CAS No. CE No. INDEX No.	Classification according to Regulation (EC) No. 1272/2008	%
Isobutane *Update 30/09/2024*	01-2119485395-27-xxxx	75-28-5 200-857-2 601-004-00-0	 Flam. Gas 1A,H220 Press. Gas,H280	≥ 97
Substances with an exposure limit in the workplace set at EU level				
Butane *Update 17/01/2025*	01-2119474691-32-xxxx	106-97-8 203-448-7 601-004-00-0	 Flam. Gas 1A,H220 Press. Gas,H280	< 3
Propane *Update 20/02/2025*	01-2119486944-21-xxxx	74-98-6 200-827-9 601-003-00-5	 Flam. Gas 1A,H220 Press. Gas,H280	< 3

H phrases description (1272/2008)
H220-Extremely flammable gas
H280-Contains gas under pressure; may explode if heated

Applicable Note K: The classification as carcinogenic is not required if it can be shown that THE MIXTURE CONTAINS LESS THAN 0.1% W/W 1.3-BUTADIENE (EINECS no. 203-450-8). If the substance is not classified as carcinogenic or mutagenic, the precautionary statements (P102-)P210-403 sould at least apply.

Applicable Note C: Some organic substances may be marketed either in a specific isomeric form or as a mixture of several isomers. In this case the supplier must state on the label whether the substance is a specific isomer or a mixture of isomers.

Applicable Note U (Table 3): When put on the market gases have to be classified as 'Gases under pressure', in one of the groups compressed gas, liquefied gas, refrigerated liquefied gas or dissolved gas. The group depends on the physical state in which the gas is packaged and therefore has to be assigned case by case.

3.2 - Mixtures
Not applicable. This product is treated like a substance.

| SECTION 4 - First aid measures

4.1 - Description of first aid measures
The product is a highly flammable gas. Asphyxiant at high concentrations, depletes oxygen can be fatal. The contact with the product in liquid form may cause frostbite. Before providing relief to the accident, isolate the area from potential sources of ignition including disconnecting electrical supply. Ensure adequate ventilation and check that it is healthy, the atmosphere should be breathable before

entering enclosed spaces. Make sure that the protective devices do not become contaminants. Use a positive-pressure breathing apparatus approved full face.
In case of incident, consult a doctor, providing the information contained on the label and in this sheet. The medication and use of medical equipment shall be carried out under strict control of the medical personnel. The first intervention – in case of accident – shall be carried out by trained and skilful personnel in order to avoid further complications or damage to the injured person. If the injured person is in a fainting state, do not supply beverages or administer any medicine by mouth. Move away the casualty from the accident area, remove all contaminated clothes and the casualty in a warm and well-ventilated place until symptoms disappear.
First responders shall wear suitable personal protective equipment.

Inhalation
In case of inhalation of product, administer first aid as follows:
Take the injured person to an uncontaminated area. If the injured person is breathing: take the person to a well-ventilated area, keep warm and at rest. Maintain the recovery position. If breathing is difficult, administer oxygen if possible, or perform assisted ventilation. Consult a doctor if breathing difficulty persists. If the injured person is unconscious and not breathing: check that there are no obstacles to breathing and perform artificial respiration by competent personnel. If necessary, perform external cardiac massage and consult a doctor. A large quantity of LPG (liquefied petroleum gas) vapors can create a lack of oxygen in the atmosphere.
In this case, use only a self-contained breathing apparatus.

Accidental eye contact
In case of accidental contact with eyes rinse lightly with water for several minutes. Remove contact lenses, if present, if the situation allows this to be done easily. In case of irritation, blurred vision or persistent swelling, consult a medical specialist. In case of persistent frostbite symptoms, such as pain, tingling, tearing or photophobia, or in case of damage caused by high-pressure jets, transfer the patient to a specialized health center. In case of cold burns from LPG (liquefied petroleum gas) involving the eyes, arrange for the injured person to be hospitalized immediately.

Accidental skin contact
In case of accidental contact with the skin wash with plenty of water. Seek medical attention immediately if irritation, swelling or redness develops and persists. Accidental rapid evaporation of liquid can cause cold burns. If symptoms of frostbite occur, such as whitening or redness of the skin or a burning or tingling sensation, do not rub, massage or compress the injured part.
Seek medical attention or take the injured person to hospital.

Ingestion
Not considered a likely source of exposure. Frostbite symptoms may occur on lips and mouth in case of contact with liquid product. Consult a doctor/medical service immediately.

4.2 - Main symptoms and effects, both acute and delayed

Symptoms/effects after inhalation:	Exposure to high concentrations of vapors, particularly in closed or inadequately ventilated environments, may cause irritation of the respiratory tract, nausea, malaise and dizziness. Lack of oxygen due to exposure to high concentrations may cause asphyxiation.
Symptoms/effects after skin contact:	Contact with the liquid may cause frostbite.
Symptoms/effects after eye contact:	Contact with eyes may cause slight transient irritation.
Symptoms/effects after ingestion:	Not applicable.
Symptoms/effects upon intravenous administration:	No information available.
Chronic symptoms:	None to be highlighted, according to the current classification criteria.

4.3 - Indication of the possibility of consulting a physician or resorting to special treatments
Immediately begin artificial respiration if breathing has stopped. Administer oxygen if necessary. If symptoms of frostbite persist, such as pain, tingling, tearing or photophobia, or if the patient has been injured by high-pressure jets, transfer the patient to a specialized medical center. If high-pressure injuries occur, seek medical attention immediately.

| SECTION 5 - Firefighting measures

5.1 - Extinguishing media

5.1.1 Suitable extinguishing media
In the case of large fires: fractionated water jet, water spray, foam.
In the case of small fires: dry chemical dust, carbon dioxide (CO_2), foam.

5.1.2 Unsuitable extinguishing media
Avoid using foam and water on the same surface at the same time as water destroys the foam.
Do not use direct water jets on the burning product.

5.2 - Special hazard deriving from the substance or mixture
Highly flammable gas.

The vapors are heavier than air, expand to the ground and form explosive mixtures with the air. Heat can cause pressure to increase in tanks exposed to fire, resulting in the explosion of closed containers, the spread of fire, and a risk of burns and injury.
Incomplete combustion generates carbon monoxide and carbon dioxide, poisonous to animals, and other toxic gases, oxygenated compounds (aldehydes, etc.).

5.3 - Advice for firefighters

Equip the fire-fighters with the following protective equipment:
- heat-resistant and flameproof suit
- Helmet with visor or hood with shield
- Fire-resistant gloves
- Fire-resistant shoes
- Self-contained breathing apparatus or anti-gas mask
- Mask with filter against acids and/or organic vapours with regard to the risks reported in the previous items, the fire size and its localization (open/closed place)
- Suitable firefighting protective equipment.

Precautionary measures in case of fire:	If safety conditions permit, stop or contain the leak at source. Do not attempt to extinguish the fire until the product leak has been stopped, or you are assured of immediate interception.
Firefighting instructions:	Remove undamaged containers from the danger zone if it is possible to do so safely. Use water jets to cool surfaces and containers exposed to flame or heat. If the fire cannot be controlled, evacuate the area.
Special equipment for firefighters:	In the event of a fire or in confined or poorly ventilated spaces, wear a garment complete with flame retardant protection and a self-contained respirator equipped with a full mask operating under pressure positive. Personal protective equipment for firefighters (see also section 8). EN 443. EN 469. EN 659.
Other information (firefighting):	In the event of a fire, do not disperse wastewater, residual product and other contaminated materials, but collect separately and treat appropriately.

SECTION 6 - Accidental release measures

6.1 - Personal precautions, protective equipment and emergency procedures

General measures:	If safety conditions permit, stop or contain the leak at source. Avoid direct contact with the released material. To remain upwind. In the event of a large spill, warn the residents of the leeward areas. Eliminate all sources of ignition if safety conditions allow it (e.g.: electricity, sparks, fires, torches). Use only non-sparking tools. Heavier than air gas/steam. It can accumulate in enclosed spaces, particularly at or below ground level. Sensors can be used to detect flammable gases or vapours.

6.1.1 *For non-emergency personnel*

In case of accidental release of the mixture, use the following personal protective equipment:
- wear appropriate personal protective equipment (see Section 8.2)
- remove uninvolved personnel from the spill area
- alert emergency teams
- except in the case of small payments, the feasibility of the interventions must always be evaluated and approved, if possible, by qualified and competent personnel in charge of managing the emergency

6.1.2 *For emergency responders*

During interventions use:
- wear appropriate personal protective equipment (see Section 8.2)
- Small spills: Normal anti-static work clothing is generally appropriate
- Large spills: Chemically resistant all-protective garment made of antistatic material. Work gloves (preferably half-arm gloves) that provide adequate resistance to chemicals. If contact with the liquefied product is possible or foreseeable, the gloves must be thermally insulated in order to avoid cold burns. Gloves made of PVA (polyvinyl alcohol) are not water-resistant and are not suitable for emergency use. Antistatic and non-slip safety shoes or boots, resistant to chemical agents. Protective helmet. Safety goggles and/or face protection if splashing or eye contact is possible or foreseeable. Respiratory protection: A half mask or a full mask equipped with an organic vapour filter(s) (AX) or a stand-alone respirator may be used, depending on the extent of the spill and the foreseeable level of exposure. In the event that the situation cannot be fully assessed or if there is a risk of oxygen deficiency, use a stand-alone respirator exclusively.

6.2 - Environmental precautions

In case of accidental release/spill:

- intervene to remove or detect the spill and apply the procedures of containment and recovery according to the indications reported in paragraph 6.3.
- in the case of pollution inform the competent authorities in accordance with local law
- block the release at the source if it is possible to do so without risk. otherwise, use water mist, keep the concentration of any gas clouds under control, favoring their dispersion into the atmosphere
- do not allow the product to end up in sewers, rivers or other bodies of water
- avoid the dispersion of the gas in places where its accumulation could be dangerous (sewers, depressions, etc.)

6.3 - Methods and material for containment and cleaning up

Comply with the following procedures of containment and recovery:

- use the protective equipment reported in paragraph 6.1
- allow the product to evaporate, favoring its dispersion
- Being heavier than air, the vapors can spread over considerable distances at ground level, explode or catch fire, and return to the source
- inside buildings or confined spaces, ensure appropriate ventilation
- if in water: the spillage of liquid product into the water will presumably result in rapid and complete evaporation
- isolate the area and prevent the risk of fire/explosion for boats and other structures, taking into account the direction and speed of the wind, until the product is completely dispersed
- the recommended measures are based on the most likely spill scenarios for this product
- local conditions (wind, air or water temperature, direction and speed of waves and currents) can, however, significantly influence the choice of action to be taken
- therefore consult local experts if necessary

6.4 - Reference to other sections

Refer to section 8 for personal protective equipment.
Refer to section 13 for disposal according to the local or National directives.

Further hazards

The liquid product evaporates quickly and forms explosive mixtures with the air. Start the intervention when the concentration of gas in air, on the place of leakage, falls below the lower limit of explosiveness.

SECTION 7 - Handling and Storage

7.1 - Precautions for safe handling

7.1.1 Reccomendations for safe handling

- risk of explosive mixture of vapours and air
- ensure that all provisions regarding handling and storage facilities for flammable products are properly complied with. Do not use electrical appliances (mobile phones, etc.) that are not approved for use, according to the risk characteristics of the area
- take precautionary measures against static electricity
- ensure the grounding of the container, tanks and equipment for reception and transfer
- steam is heavier than air pay special attention to buildup in wells and confined spaces
- keep away from heat sources/sparks/open flames/hot surfaces. No smoking
- use only bottom loading for tanks, in accordance with the relevant European legislation
- do not use compressed air during filling, unloading or handling
- use and store only outside or in a well-ventilated place
- before starting any type of intervention in a confined space (e.g. tunnels), check the atmosphere and check the oxygen content and the degree of flammability
- empty containers may contain combustible product residues
- do not puncture, cut, grind, weld, braze, burn, or incinerate empty containers or drums that have not been reclaimed

7.1.2 Hygiene measures

During handling use the protective equipment indicated in paragraph 8 of this sheet and the following procedures:

- ensure that adequate housekeeping measures are taken
- avoid contact with eyes and skin
- do not breathe vapors
- use appropriate personal protective equipment if necessary
- keep away from food and drink. Do not eat, drink, or smoke while using this product
- wash hands and other areas of skin exposed to the substance with mild soap and water before eating, drinking, smoking, and when leaving the workplace
- do not reuse clothing that is still contaminated
- contaminated work clothing should not be taken out of the workplace

7.2 - Conditions for safe storage, including any incompatibilities

Observe the following precautions when storing the product:

- keep the preparation chemical-physical characteristics in mind to avoid any interactions with other products (see paragraph 10)
- store in a dry and well-ventilated place
- store away from open flames, hot surfaces and sources of ignition. No smoking
- the vapours are heavier than air, and can propagate at ground level
- pay special attention to accumulation in wells and confined spaces
- the structure of the storage area, the characteristics of the tanks, the equipment and the operating procedures must comply with the relevant legislation at European, national or local level
- cleaning, inspection and maintenance of the internal structure of storage tanks must be carried out by qualified and properly equipped personnel, as established by national, local, or company regulations
- for maintenance and conservation activities, empty tanks must be reclaimed and filled with inert gas (e.g. nitrogen)
- before accessing storage tanks and starting any type of intervention in a confined space (e.g. tunnels), carry out adequate remediation, check the atmosphere and check the oxygen content and the degree of flammability
- store only in the original container or in a container suitable for the type of product
- keep containers carefully closed and correctly labelled
- cylinders should not be stored in the vicinity of other cylinders that contain compressed oxygen
- empty containers may contain combustible product residues
- do not weld, braze, drill, cut, or incinerate empty containers unless they have been properly cleaned/reclaimed
- use mild steel and stainless steel for containers and coatings
- some synthetic materials may not be suitable for containers or coatings based on the characteristics of the material and the intended uses
- check compatibility with the manufacturer, according to the specific conditions of use

Storage class: 2 (Gas)

Storage temperature: < 50°C
Storage pressure: Gas under pressure
Special Sensitivity: Protect from sunlight. Store in a well-ventilated place

Material suitability: It melts fat and attacks natural rubber. Compatible with metal materials.
Suitable materials and coatings: metals of appropriate thickness.
The compatibility with plastic materials may vary; we recommend testing before use.
Containers normally employed for transportation: tankers for gas, cylinders, tubes, pressure drums, bundles of cylinders.

The containers, including the empties, must be stored in well-ventilated areas, with safety catch on.

OTHER WARNINGS: The container is still a danger even when emptied of the product contained. Continue to observe all precautions.

7.3 - Specific end uses

The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s) (if available).

| SECTION 8 - Exposure control and personal protection

The following information refers to industrial handling of the product.

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

Use the product according to the indications reported in this sheet, paying particular attention to the indications contained in paragraph 7.1. Use the protective equipment described in paragraph 8.2.
It is recommended an air extraction system when the product is in confined spaces as well as it is heated at a temperature higher than the room temperature.
The Safety Data Sheet (SDS) is an informative document that takes into account the chemical nature of a hazardous substance or preparation and the negative effects it may cause.
PPE stands for Personal Protective Equipment and shall be compulsorily used when facing a "Residual Risk". The "Residual Risk" belongs to a working situation and it is tightly linked to the conditions in the working environment and the organization of the work.
The references to the PPE to be used – contained in the Safety Data Sheet – can only be informative, they cannot hence go beyond the limits imposed by the attributions of responsibilities.
The responsibility of choice of the suitable PPE according to the risk conditions in the working environment shall be on the EMPLOYER.

8.1 – Control parameters

This product contains the following substance, which has the following exposure limits:

Substance	iso-Butane					
CAS No.	75-28-5					
	Limit value - TWA			Limit value - STEL		
	ppm	mg/m³	F/cm³	ppm	mg/m³	F/cm³
Austria	800	1900		1600 (1)	3800 (1)	
Belgium				980 (1)	2370 (1)	
Finland	800	1900		1000 (1)	2400 (1)	
Germany (AGS)	1000	2400		4000 (1)	9600 (1)	
Germany (DFG)	1000	2400		4000 (1)	9600 (1)	
Ireland				1000 (1)		
South Korea	800					
Switzerland	800	1900				
Switzerland	800	1900				
	Remarks					
Austria	(1) 60 minutes average value					
Belgium	(1) 15 minutes average value					
Finland	(1) 15 minutes average value					
Germany (AGS)	(1) 15 minutes average value					
Germany (DFG)	(1) 15 minutes average value					
Ireland	(1) 15 minutes average value					

- **The following data are related to <u>Isobutane</u>:**

<u>MAK-COMMISSION</u>
1000 ml/m³
2400 mg/m³

Peak limitation: Excursion factor 4
Duration 15 min, mean; 4 times per shift; interval 1 hour
Category II - Substances with systemic effects

Pregnancy: Group D
A classification according to groups A-C is not possible, because either there is no data available or the available data is insufficient for a final evaluation.

Always try to work either in natural or in mechanical ventilation conditions so as to be sure that the gas does not exceed 25% LEL.
The concentrations that are dangerous for professional inhalation, and that if exceeded may entail an exposure damage, are provided by the 2010 ACGIH TLV tables as follows:
TLV TWA: weighted average concentration per working day of 8 hours (chronic exposure) to which all the workers can be repeatedly exposed day by day with no negative effects:
Butane: 800 ppm (1900 mg/m³)
Propane: 1000 ppm (1800 mg/m³)
ACGIH also recommends that the exposure threshold limit values of the biologically inert particles, having no TLV value, are kept under 3 mg/m³ for the breathable particles; and under 10 mg/m³ for the inhalable ones.
As far as the monitoring/control conditions are concerned, please refer to the laws and regulations in force.

Substance	n-Butane					
CAS No.	106-97-8					
	Limit value - TWA			Limit value - STEL		
	ppm	mg/m³	F/cm³	ppm	mg/m³	F/cm³
Australia	800	1900				

Austria	800	1900	1600 (1)	3800 (1)
Belgium			980 (1)	2370 (1)
Canada - Ontario			1000 (1)	
Canada - Québec	800	1900		
Denmark	500	1200	1000	2400
Finland	800	1900	1000 (1)	2400 (1)
France	800	1900		
Germany (AGS)	1000	2400	4000 (1)	9600 (1)
Germany (DFG)	1000	2400	4000 (1)	9600 (1)
Hungary		2350		9400 (1)
Ireland			1000 (1)	
Japan (JSOH)	500	1200		
Latvia		300		
New Zealand	800	1900		
Norway	250	600		
Poland		1900		3000 (1)
Singapore	800	1900		
South Africa			2000 (1)	
South Africa Mining	600	1430	750 (1)	1780 (1)
South Korea	800			
Spain	1000			
Switzerland	800	1900		
USA - NIOSH	800	1900		
United Kingdom	600	1450	750 (1)	1810 (1)

	Remarks
Austria	(1) 60 minutes average value
Belgium	(1) 15 minutes average value
Canada - Ontario	(1) 15 minutes average value
Finland	(1) 15 minutes average value
Germany (AGS)	(1) 15 minutes average value
Germany (DFG)	(1) 15 minutes average value
Hungary	(1) 15 minutes average value
Ireland	(1) 15 minutes average value
Poland	(1) 15 minutes average value
South Africa	(1) Ceiling limit value
South Africa Mining	(1) 15 minutes average value
United Kingdom	(1) 15 minutes average value

- **The following data are related to <u>Butane</u>:**

<u>MAK-COMMISSION</u>
1000 ml/m^3
2400 mg/m^3

Peak limitation: Excursion factor 4

Duration 15 min, mean; 4 times per shift; interval 1 hour
Category II - Substances with systemic effects

Pregnancy: Group D
A classification according to groups A-C is not possible, because either there is no data available or the available data is insufficient for a final evaluation.

Substance	Propane					
CAS No.	74-98-6					
	Limit value - TWA			Limit value - STEL		
	ppm	mg/m³	F/cm³	ppm	mg/m³	F/cm³
Austria	1000	1800		2000 (1)	3600 (1)	
Belgium	1000					
Canada - Ontario						
Canada - Québec	1000	1800				
Denmark	1000	1800		2000	3600	
Finland	800	1500		1100 (1)	2000 (1)	
Germany (AGS)	1000	1800		4000 (1)	7200 (1)	
Germany (DFG)	1000	1800		4000 (1)	7200 (1)	
Latvia	1000	1800				
New Zealand						
Norway	500	900				
Poland		1800				
Romania	778	1400		1000 (1)	1800 (1)	
South Africa Mining	1000	1800				
Spain	1000					
Switzerland	1000	1800		4000	7200	
USA - NIOSH	1000	1800				
USA - OSHA	1000	1800				
	Remarks					
Austria	(1) 60 minutes average value					
Finland	(1) 15 minutes average value					
Germany (AGS)	(1) 15 minutes average value					
Germany (DFG)	(1) 15 minutes average value					
New Zealand	Simple asphyxiant – may present an explosion hazard					
Romania	(1) 15 minutes average value					

- **The following data are related to <u>Propane</u>:**

<u>MAK-COMMISSION</u>
1000 ml/m³
1800 mg/m³

Peak limitation: Excursion factor 4
Duration 15 min, mean; 4 times per shift; interval 1 hour
Category II - Substances with systemic effects

Pregnancy: Group D
A classification according to groups A-C is not possible, because either there is no data available or the available data is insufficient for a final evaluation

- **The following data are referred to Propane, Isobutane, Butane:**

DNEL Values (Derived-No-Effect-Levels) and DMEL (Derived Minimal Effect Levels):
Non derived since the mixture does not contain any components classified as hazardous to health.
It is advisable comply with the above mentioned exposure limit values for all the applications (please refer to the TLV indicated in this section)

PNEC(S) values (Predicted No Effect Concentration):

PNEC(S) values for water (continuous release):
Non derived since the product does not contain any components classified as hazardous to the environment.

PNEC values for water (intermittent release):
Non derived since the product does not contain any components classified as hazardous to the environment.

PNEC values for soil:
Non derived since the product does not contain any components classified as hazardous to the environment.

PNEC values for sediments:
Non derived since the product does not contain any components classified as hazardous to the environment.

PNEC values for wastewater treatment plants:
Non derived since the product does not contain any components classified as hazardous to the environment.

Recommended monitoring procedures
This product contains ingredients with exposure limits, personal monitoring of the atmosphere or biological in the work environment may be required to determine the effectiveness of ventilation or other control measures and/or the need to use respiratory protective equipment. To find information on this subject, consult:
http://amcaw.ifa.dguv.de/WForm09.aspx.

8.2 - Exposure controls

Consumer exposure control:
The substances contained in this mixture are handled under Strictly Controlled Conditions in accordance with REACH regulation Article 17(3) for on-site isolated intermediates. In case the substances are transported to other sites for further processing, the substances should be handled at these sites under the Strictly Controlled Conditions as specified in REACH regulation Article 18(4). Site documentation to support safe handling arrangements including the selection of engineering, administrative and personal protective equipment controls in accordance with risk-based management systems is available at each Manufacturing site. Written confirmation of application of Strictly Controlled Conditions has been received from every affected Distributor and Downstream Manufacturer/User of the Registrant's intermediate.

8.2.1 *Appropriate engineering controls*
In the open circuit systems – where the contact with the product may occur – wear safety goggles, clothing with long sleeves and chemical impermeable gloves. In the event that the product concentration in the air should exceed the limits reported in this section and if the systems, operational procedures and other means to limit the exposure of workers should not be adequate, a protective equipment of the respiratory tract is necessary.
Ensure adequate ventilation, especially in confined areas.

8.2.2 *Individual protection measures, such as personal protective equipment*
The choice of the personal protective equipment shall be consistent with good occupational hygiene practices and varies according to the conditions of potential exposure such as applications, handling procedures, concentration and ventilation. Information provided below on the choice of the proper equipment is based upon the regular employment set out herein.
PRECAUTION MEASURES:
Workplace must be equipped with showers.
SPECIFIC HYGIENE MEASURES:
Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.
PERSONAL HYGIENE:
provide the working environment with structures suitable for allowing people to wash. Change the suits, overalls, the clothing wore under suits and shoes.
WORKING METHOD:
both the use and choice of the personal protective equipment depend on the product risk, the working conditions and the processing. In general, it is recommended to use the safety goggles with side shields, working clothes that protect the arms, legs and body as minimum protection. Moreover, every visitor entering the area where the product is handled should at least wear safety goggles with side shields.

EXPOSURE CONTROL:
keep the hygiene of the working place, use correct working methods and, in the event that the product is used by operators with dry skin or in cold environments, follow the instructions of the next passage.
Change the gloves which were used (polyvinyl chloride, polyethylene, neoprene, non-natural rubber) when there are wear signs, cracks or internal contaminations.
In the event that the concentrations in air may exceed the limits given in this section, it is recommended to use a mask with filter to protect from overexposure through inhalation. The filter typology depends on the quantity and type of chemicals which are handled in the workplace.
SKIN CARE:
personal hygiene is the most effective protection factor. Do not use abrasives or solvents. The use of repair creams after working is advisable to regenerate the lipid layer and it is recommended in the wintertime for those operators with dry skin. In fact, low temperatures and humidity may cause skin abrasions, thus making the workers more vulnerable to the action of the existing chemicals.

a) Eyes/face protection
If eye contact is possible, use safety glasses or other protective equipment (face shields). If necessary, refer to the UNI EN 166 standard.

b) Skin protection
Hand protection:
If there is a possibility of contact with the skin, use hydrocarbon-resistant gloves, plush on the inside.
Presumably suitable materials: nitrile (NBR) or PVC with a protection index of at least 5 (permeation time ≥ 240 min). If contact with the liquefied product is possible or foreseeable, the gloves must be thermally insulated in order to avoid cold burns. Use gloves in accordance with the conditions and limits set by the manufacturer. Replace gloves immediately if they show cuts, holes, or other signs of degradation. If necessary, refer to the UNI EN 374 standard. Personal hygiene is a fundamental element for effective hand care. Gloves should only be worn with clean hands. After using gloves, hands should be washed and dried perfectly.
Other:
Work clothes with long sleeves. For the definition of the characteristics and performance according to the risks of the work area, refer to the UNI EN 340 standards and the other applicable UNI-EN-ISO standards. Antistatic and non-slip safety shoes or boots, resistant to chemical agents. Remove contaminated clothing and shoes.

c) Respiratory protection
Regardless of other possible actions (plant adjustments, operating procedures and other means to reduce workers' exposure), the personal protective equipment that can be adopted as needed is indicated. In ventilated or outdoor environments: if the product is handled without suitable vapor containment systems, use masks or half-masks with a hydrocarbon vapor (AX) filter. (EN 136/140/145). Combined filter device (DIN EN 141). In confined spaces (e.g. inside tanks): the adoption of respiratory protective devices (half masks, masks, respiratory devices) must be evaluated according to the work activity, the duration and the foreseeable intensity of exposure. For the characteristics, refer to the Ministerial Decree 02/05/2001. If exposure levels cannot be determined or estimated with good certainty, or if oxygen deficiency may occur, use only a stand-alone respirator. A large amount of LPG (liquefied petroleum gas) vapors can create a shortage of oxygen in the atmosphere. In this case, use only a stand-alone respirator.

d) Thermal hazards
A combustible gas detector can be used to check for flammable gas or vapors

8.2.3 *Environmental exposure controls*
Avoid release to the environment.

| SECTION 9 - Physical and chemical properties

9.1 - Information on basic physical and chemical properties

a) Physical state: liquefied gas under pressure

b) Colour: colourless

c) Odour: characteristic
Odour threshold: no data available

d) Melting point/ Freezing point: -187°C ÷ -138°C

e) Boiling point or initial boiling point and boiling range: -88°C ÷ -0,5°C

f) Inflammability (solid, gas): Not applicable. The substance is extremely volatile at room temperature.

g) Lower and upper explosion limit: 1,86 vol % and 9,5 vol %

h) Flash point: <-60°C

i) **Auto-ignition temperature:** 287°C ÷ 537°C

j) **Decomposition temperature:** data not available.

k) **pH:** Data not relevant.

l) **Viscosity:** data not available.

m) **Solubility:** Water: 24,4 ÷ 60,4 mg/l at 20°C

n) **N-octanol/water partition coefficient:** 2,76

o) **Vapour pressure:** 275 ÷ 1500 kPa (40°C – EN ISO 4256)

p) **Density and/or relative density:** 560 ÷ 585 kg/m^3 at 15°C

q) **Vapour density (air=1):** data not available.

r) **Particle characteristics:** Data not relevant.

9.2 – Other information
Molar mass: 58,12 g/mol
Gases under pressure
Critical temperature: 135,0°C
Critical pressure: 36,5 bar

N.B.: Data reported herein are typical average values and not specification limits.

SECTION 10 - Stability and reactivity

10.1 - Reactivity
The substance does not present any additional reactivity hazards than those reported in the following subheadings.

10.2 - Chemical stability
The product is to be considered:
- stable under normal conditions, but may become unstable under particular conditions (see paragraphs 10.3 and 10.4).

10.3 - Possibility of hazardous reactions
Dangerous reactions (under normal storage and handling conditions) are not to be expected. Contact with strong oxidants (such as peroxides and chromates) may cause a fire hazard. A mixture with nitrates or other strong oxidants (such as chlorates, perchlorates and liquid oxygen) can generate an explosive mass. Sensitivity to heat, friction and shock cannot be assessed in advance

10.4 - Conditions to avoid
Keep away from strong oxidants. Store away from open flames, hot surfaces and ignition sources. Avoid the accumulation of electrostatic charges.

10.5 - Incompatible materials
Strong oxidants.

10.6 - Hazardous decomposition products
Under normal storage and use conditions, no hazardous decomposition products should be created. Thermal decomposition can produce: Toxic fumes.

SECTION 11 - Toxicological information

11.1 - Information on hazard classes as defined in Regulation (EC) No 1272/2008

a) Acute toxicity
Acute toxicity (oral): Not classified (Conclusive but not sufficient for classification)
Acute toxicity (dermal): Not classified (Conclusive but not sufficient for classification)
Acute toxicity (inhalation): Not classified (Conclusive but not sufficient for classification)
Additional information: Depending on the composition.

Isobutane (75-28-5)	
Inhalation LC50	1443 mg/l (air, 15 minuts, rat)

	800000 ppm (15 minuts, rat)
	1237 mg/l (2 hours, air, mouse)
	520400 – 539600 ppm (2 hours, mouse)

b) Skin corrosion/Skin irritation
Unclassified (Based on the available data, the classification criteria are not met).
pH : Not applicable.
(depending on the composition).

c) Serious eye damage/irritation
Unclassified (Based on the available data, the classification criteria are not met).
pH : Not applicable.
(depending on the composition).

d) Respiratory or skin sensitisation
Unclassified (Based on the available data, the classification criteria are not met).
pH : Not applicable.
(depending on the composition).

e) Mutagenicity assessment
Unclassified (Based on the available data, the classification criteria are not met).
(depending on the composition).
This product contains < 0.1 %p of 1,3 butadiene (EINECS 203-450-8) Non-mutagenic.

f) Carcinogenicity assessment
Unclassified (Based on the available data, the classification criteria are not met).
(depending on the composition).
This product contains: butane
This product contains < 0.1 %p of 1,3 butadiene (EINECS 203-450-8) Non-mutagenic.

g) Reproductive toxicity
Unclassified (Based on the available data, the classification criteria are not met).
(depending on the composition).

h) STOT - Single exposure
Unclassified (Based on the available data, the classification criteria are not met).
(depending on the composition).

Propane (74-98-6)	
LOAEC (inhalation, rat, gas)	12000 ppmv/4h
NOAEC (inhalation, rat, gas)	4000 - 16000 ppmv/4h

i) STOT - Repeated exposure
Unclassified (Based on the available data, the classification criteria are not met).
(depending on the composition).

Butane (106-97-8)	
NOAEC (inhalation, rat, gas, 90 days)	9000 ppmv/6h/giorno (Sprague-Dawley CD) - male/female
Propane (74-98-6)	
LOAEC (inhalation, rat, gas, 90 days)	12000 ppmv/6h/day
NOAEC (inhalation, rat, gas, 90 days)	9000 ppmv/6h/day (Sprague-Dawley CD) - male/female

j) Aspiration hazard
Unclassified (Based on the available data, the classification criteria are not met).
(depending on the composition).
Not applicable due to the physical state of the product.
Kinematic viscosity: Test not required.

11.2 - Further information

Adverse health effects caused by endocrine disrupting properties: The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

Potential adverse human health effects and symptoms: None to be expected at room temperature, Contact with liquids, containers and distribution lines that have contained LPG (liquefied petroleum gas) should be avoided in order to prevent cold burns,
Lack of oxygen related to exposure to high concentrations can cause asphyxiation. Repeated and prolonged contact can cause redness of the skin, irritation and contact dermatitis due to degreasing effect, Contact with the eyes can cause temporary redness and irritation, High concentrations of vapors can cause: migraine, nausea, dizziness.

Other information: None.

| SECTION 12 - Ecological information

This substance is classified as Volatile Organic Compound in accordance with Directive 2010/75/UE

12.1 - Toxicity

Ecology – general: Not harmful to aquatic organisms. Dispersion into the environment can still lead to the contamination of environmental matrices (air). Use according to good working practice, avoiding dispersing the product into the environment.

Ecology - air: In the event of dispersion into the environment, the constituents of the product evaporate into the atmosphere, where they undergo rapid degradation processes by hydroxyl radicals. This phenomenon can contribute to the formation of photochemical smog, but depends on complex interactions with other pollutants, and on the local weather conditions.

Ecology – water: No testing is required as the substance is a gas (REACH Annex VII-VIII, #2).

Hazardous to the environment aquatic, short term (acute): Not classified (Based on the available data, the classification criteria are not met).

Hazardous to the environment aquatic, long term (chronic): Not classified (Based on the available data, the classification criteria are not met).

Isobutane (75-28-5)	
LC50	14,22 - 69,43 mg/l (48 h , vertebrates)
LC50	24,11 - 147,54 mg/l (4 days, fish)
EC50	7,71 - 19,37 mg/l (4 days, algae)

12.2 - Persistence and degradability

Persistence and degradability: From an environmental point of view, the product must be considered as "non-persistent", according to the criteria of the REACH reg. annex XIII (point 1.1).

Biodegradation: 100 % (Etane) (16d, Read-across, QSAR).

Butane (106-97-8)	
Persistence and degradability:	Readily biodegradable.
Biodegradation:	50 % after 3.46 days (degradation calculated by QSAR method)
Propane (74-98-6)	
Persistence and degradability:	Readily biodegradable.
Biodegradation:	100 % (16d. QSAR Read-Across).

12.3 - Bioaccumulative potential

Bioaccumulation potential: Bioaccumulation unlikely.

Isobutane (75-28-5)	
Log Pow:	2,76
Bioconcentration factor:	1,09 – 2,8 (Information from literature)
Butane (106-97-8)	
Log Pow:	2,89
Log Kow:	≤ 3
Bioaccumulation potential:	Weak potential for bioaccumulation.
Propane (74-98-6)	
Bioconcentration factor (FCB REACH):	1,56

Log Kow:	2,36
Bioaccumulation potential:	Weak potential for bioaccumulation.

12.4 - Mobility in soil

Mobility in the soil: Not applicable due to the physical state of the product.
Ecology - soil: The product is very volatile.

Butane (106-97-8)	
Ecology - soil	The product is very volatile. There is no indication of biological accumulation potential.
Propane (74-98-6)	
Ecology - soil	The product is very volatile. There is no indication of biological accumulation potential.

12.5 - Results of PBT and vPvB assessment

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII.
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII.

12.6 - Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties: The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

12.7 - Other adverse effects

Global warning potential (GWP): 0
Ozone depletion potential (ODP): 0
Use the product in compliance with best practices and avoid dispersion into the environment.
High concentrations of ozone are associated with adverse effects on humans and during the season of crops with different damage on crops, forests and vegetation.

German water hazard class: not hazardous to water

| SECTION 13 - Disposal considerations

13.1 - Waste treatment methods

This product shall be classified as: **hazardous special waste**. Recover, if possible.
This product CANNOT be disposed of in dumps and/or through public sewers, channels, waterways, watercourses or rivers. This product can be incinerated in suitable thermal disposal plants in accordance with the regulations in force. The waste originated from or contaminated by the preparation shall have to be classified, stored and sent to a suitable disposal plant complying with the national and regional regulations in force. For handling and storing the waste originating from or contamined by the preparation, apply the procedures and precautions described in paragraphs 6, 7 and 8 of this Sheet.

Containers disposal

The containers, although completely emptied out, shall not be dispersed into the environment. The product containers shall be duly decontaminated before starting their disposal. The containers containing the product residues must be classified, stored and sent to a suitable disposal plant complying with the national and regional regulations in force.
Empty pressure vessels should be returned to the supplier.

European Waste Catalogue Code

According to its use, the product may be catalogued according to different codes. General indications cannot be given. The product as supplied does not contain halogenated compounds.
The user must be aware that the use conditions may change the waste code after the use. Refer to Directive 2001/118/EC for waste definition.

The substance, in case of disposal as it is, pursuant to Directive 2008/98/EC, must be classified as hazardous waste:
- HP3 - "Flammable".

Procedure for the Waste treatment: The product as such is not specifically regulated. Dispose of empty containers and waste safely.

Recommendations

for disposal:	European Waste Catalogue code(s) (Decision 2001/118/EC) : 16 05 04* gases in pressure vessels (including halons), containing hazardous substances). The EWC code indicated is only a general indication, based on the original composition of the product and its intended use. The user has the final responsibility to choose the most appropriate EWC code, based on the actual use of the product and any alterations or contamination.
Additional Guidance:	Empty containers may contain combustible product residues. Do not puncture, cut, grind, weld, braze, burn, or incinerate unreclaimed empty containers or drums. Dispose of empty containers that have not been reclaimed in safe conditions, according to Legislative Decree 152/2006 and subsequent amendments.
Ecology - waste:	The product as such does not contain halogenated compounds.
EURAL (CER):	16 05 04* - Gases in pressure vessels (including halons), containing hazardous substances.

SECTION 14 - Transport information

Precautions: The product is hazardous and subject to restrictions for transport.

Transport label: 2.1
Alternatively, symbol (flame and number) black or white; background: red.

14.1 – UN number or ID number

ADR-RID	(Overland transport)	UN Number: UN 1969
ADNR/ADN	(Inland waterway transport)	UN number: UN 1969
IMDG	(Sea transport)	UN Number: UN 1969
ICAO-IATA	(Air transport)	UN Number: UN 1969

14.2 - UN proper shipping name

ADR-RID	(Overland transport)	UN proper shipping name: Isobutane
ADNR/ADN	(Inland waterway transport)	UN proper shipping name: Isobutane
IMDG	(Sea transport)	UN proper shipping name: Isobutane
ICAO-IATA	(Air transport)	UN proper shipping name: Isobutane

14.3 - Transport hazard classes

ADR-RID	(Overland transport)	Hazard class: 2
ADR-RID	(Overland transport)	Hazard identification no.: 23
ADR-RID	(Overland transport)	Hazard label: 2.1
ADR-RID	(Overland transport)	Classification code: 2F
ADNR/ADN	(Inland waterway transport)	Hazard class: 2
ADNR/ADN	(Inland waterway transport)	Hazard label: 2.1
ADNR/ADN	(Inland waterway transport)	Classification code: 2F
IMDG	(Sea transport)	Hazard class: 2
IMDG	(Sea transport)	Hazard label: 2.1
ICAO-IATA	(Air transport)	Hazard class: 2
ICAO-IATA	(Air transport)	Hazard label: 2.1

14.4 - Packing group

ADR-RID	(Overland transport)	Packing group:--
ADR-RID	(Overland transport)	Special dispositions: 392,657,662,674
ADR-RID	(Overland transport)	Limited quantities: 0
ADR-RID	(Overland transport)	Exempt quantities: E0
ADR-RID	(Overland transport)	Packing instructions: P200
		Periodicity of the tests (years): 10
		Testing pressure (bar): 10
		Filling level: 0,49
		Special packing dispositions: ra, v
ADR-RID	(Overland transport)	Common packing: MP9
ADR-RID	(Overland transport)	Tank code: PxBN (M)
ADR-RID	(Overland transport)	Mobile tanks and containers for bulk transport:
		Special dispositions: --
		Transport instructions: T50 (M)

		Maximum authorized service pressure (bar): Small tank; Naked cistern; Tank with sunshade; Tank with thermal insulation; respectively: 8,5; 7,5; 7,0; 7,0 Opening below fluid level: Allowed Pressure measurement requirements: Normal Maximum filling ratio: 0,49
ADR-RID	(Overland transport)	Transport category (Tunnel restriction code): 2 (B/D): Passage forbidden through tunnels of category B and C for transport via tank. Passage forbidden through tunnels of category D and E.
IMDG	(Sea transport)	Packing group:--
IMDG	(Sea transport)	Special dispositions: 392
IMDG	(Sea transport)	Limited quantities: 0
IMDG	(Sea transport)	Exempt quantities: E0
IMDG	(Sea transport)	Packing instructions: P200 Periodicity of the tests (years): 10 Testing pressure (bar): 10 Filling level: 0,52 Special packing dispositions: ra, v
ADR-RID	(Overland transport)	Common packing: MP9
IMDG	(Sea transport)	Mobile tanks and containers for bulk transport: Dispositions: -- Tanks instructions: T50 Maximum authorized service pressure (bar): Small tank; Naked cistern; Tank with sunshade; Tank with thermal insulation; respectively: 8,5; 7,5; 7,0; 7,0 Opening below fluid level: Allowed Pressure measurement requirements: Normal Maximum filling ratio: 0,49
ICAO-IATA	(Air transport)	Packing group:--

14.5 - Environmental hazards

This substance is not classified as environmentally hazardous.

IMDG	(Transport by sea)	Marine pollutant: No

14.6 - Special precautions for users

Packages shall not be stowed in the vehicle. The cylinders must be kept upright and carried only in a safe position, preferably well-ventilated vehicles or open carriages.
Avoid transport on vehicles where the load space is not separated from.
Make sure that the driver is aware of the potential hazards of the load and knows what to do in case of an accident or emergency.
Before starting cylinder transport:
- Make sure the load is correctly anchored
- Make sure the cock is tightly closed and does not leak
- Make sure the blind cap of valve – when provided – is correctly mounted
- Make sure the cap (when provided) is correctly applied on the cock outfeed
- Make sure there is a good ventilation.

Transport shall be carried out on vehicles authorized to the carriage of dangerous goods, following the provisions of A.D.R. agreement in force as well as applicable national.
Goods shall be carried in their original packaging and, in any case, in content-resistant packages which might not cause any dangerous reaction with the content and not subject to generate dangerous reactions with it.
Operators in charge of the dangerous goods loading and unloading shall be duly trained on the risks deriving from the goods and on any procedure to be adopted in case of emergency.

IMDG (Sea transport)

IMDG	(Sea transport)	Emergency procedures (Ems): F-D, S-U
IMDG	(Sea transport)	Stowage and handling: Category E, SW2

In case of shipment inside a refrigeration machine the gas is classified from UN 1969 to UN 3358 and can be shipped under special provision 291 for Maritime transportation (with limited quantities 12 kg)

291	IMDG - International Maritime Dangerous Goods code
Flammable liquefied gases shall be contained within refrigerating-machine components. These components shall be designed and tested to at least three times the working pressure of the machinery. The refrigerating machines and refrigerating-machine components shall be designed and constructed to contain the liquefied gas and preclude the risk of bursting or cracking of the pressure-retaining components during normal conditions of transport. Refrigerating machines and refrigerating-machine components are not subject to the provisions of this Code if they contain less than 12 kg of gas.	

Other information:

Cylinder minimum testing pressure: with thermal insulation: 1 Mbar 10 bar
without thermal insulation: 1 Mbar 10 bar
Permissible maximum mass of the content per capacity liter: 0,49 kg

14.7 - Maritime transport in bulk according to IMO instruments
For the transport in bulk, stick to Annex II MARPOL and to the IBC code whereas applicable.

| SECTION 15 - Regulatory information

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

NOTIFICATION STATUS
CAS number: 75-28-5

China. Inventory of Existing Chemical Substance in China (IECSC)	IECSC	listed (product or component listed)
Taiwan. Existing Chemicals Inventory	TCSI	listed (product or component listed)
Japan. Kashin-Hou Law List	ENCS (JP)	listed (product or component listed)
Korea. Korean Existing Chemicals Inventory (KECI)	KECI (KR)	listed (product or component listed)
USA Toxic Substance Control Act	TSCA	listed (product or component listed)
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	NZIOC	listed (product or component listed)
Philippines. The Toxic Substance and Hazardous and Nuclear Waste Control Act	PICCS (PH)	listed (product or component listed)
Australia. Industrial Chemical (Notification and Assessment) Act	AICS	listed (product or component listed)
Canada. Environmental Protection Act Domestic Substance List (DSL). (Can. Gaz. Part II, Vol. 144)	DSL	listed (product or component listed)
Thailand Existing Chemicals Inventory (TECI)	TECI	listed (product or component listed)
List of Hazardous and Toxic Chemicals in India		not listed (product or component not listed)
List of Restricted Industrial Chemicals in Vietnam (Decree No. 113/2017/ND-CP annex 2)		not listed (product or component not listed)
Malaysia List of Classified Substances		not listed (product or component not listed)
Indonesia List of Usable Hazardous and Toxic Substances		not listed (product or component not listed)
Singapore List of Controlled Hazardous Substances under EMPA		not listed (product or component not listed)
Russian Inventory of Existing Chemical Substances (DRAFT)		listed (product or component listed)
National Inventory of Chemical Substances in Mexico		listed (product or component listed)
Swiss List of Restricted Substance (ORRChem)	(ORRChem)	not listed (product or component not listed)
List of Prescribed Hazardous Substances in Islamic Republic of Pakistan		not listed (product or component not listed)

CAS number: 106-97-8

China. Inventory of Existing Chemical Substance in China (IECSC)	IECSC	listed (product or component listed)
Taiwan. Existing Chemicals Inventory	TCSI	listed (product or component listed)
Japan. Kashin-Hou Law List	ENCS (JP)	listed (product or component listed)
Korea. Korean Existing Chemicals Inventory (KECI)	KECI (KR)	listed (product or component listed)
USA Toxic Substance Control Act	TSCA	listed (product or component listed)
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	NZIOC	listed (product or component listed)
Philippines. The Toxic Substance and Hazardous and Nuclear Waste Control Act	PICCS (PH)	listed (product or component listed)
Australia. Industrial Chemical (Notification and Assessment) Act	AICS	listed (product or component listed)

Canada. Environmental Protection Act Domestic Substance List (DSL). (Can. Gaz. Part II, Vol. 144)	DSL	listed (product or component listed)
Thailand Existing Chemicals Inventory (TECI)	TECI	not listed (product or component not listed)
List of Hazardous and Toxic Chemicals in India		listed (product or component listed)
List of Restricted Industrial Chemicals in Vietnam (Decree No. 113/2017/ND-CP annex 2)		not listed (product or component not listed)
Malaysia List of Classified Substances		not listed (product or component not listed)
Indonesia List of Usable Hazardous and Toxic Substances		not listed (product or component not listed)
Singapore List of Controlled Hazardous Substances under EMPA		not listed (product or component not listed)

CAS number: 74-98-6

China. Inventory of Existing Chemical Substance in China (IECSC)	IECSC	listed (product or component listed)
Taiwan. Existing Chemicals Inventory	TCSI	listed (product or component listed)
Japan. Kashin-Hou Law List	ENCS (JP)	listed (product or component listed)
Korea. Korean Existing Chemicals Inventory (KECI)	KECI (KR)	listed (product or component listed)
USA Toxic Substance Control Act	TSCA	listed (product or component listed)
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	NZIOC	listed (product or component listed)
Philippines. The Toxic Substance and Hazardous and Nuclear Waste Control Act	PICCS (PH)	listed (product or component listed)
Australia. Industrial Chemical (Notification and Assessment) Act	AICS	listed (product or component listed)
Canada. Environmental Protection Act Domestic Substance List (DSL). (Can. Gaz. Part II, Vol. 144)	DSL	listed (product or component listed)
Thailand Existing Chemicals Inventory (TECI)	TECI	listed (product or component listed)
List of Hazardous and Toxic Chemicals in India		not listed (product or component not listed)
List of Restricted Industrial Chemicals in Vietnam (Decree No. 113/2017/ND-CP annex 2)		not listed (product or component not listed)
Malaysia List of Classified Substances		not listed (product or component not listed)
Indonesia List of Usable Hazardous and Toxic Substances		listed (product or component listed)
Singapore List of Controlled Hazardous Substances under EMPA		not listed (product or component not listed)
Russian Inventory of Existing Chemical Substances (DRAFT)		listed (product or component listed)
National Inventory of Chemical Substances in Mexico		listed (product or component listed)
Swiss List of Restricted Substance (ORRChem)	(ORRChem)	not listed (product or component not listed)
List of Prescribed Hazardous Substances in Islamic Republic of Pakistan		not listed (product or component not listed)

Please note: the names and CAS numbers which are used for this product in the state inventories may deviate from the information which is listed in chapter 3.

National Legislation : Whereas applicable, refer to the following regulations:
Presidential Decree (D.P.R.) 175/88 as amended
Presidential Decree 303/56 of 19/05/1956
Ministerial Circulars 45 and 61
Law Decree 81/2008 as amended

National Legislation : Other regulations in force:

- threshold limit values (TLV) and exposure biological indicators (EBI) ACGIH 1998 as amended.
- Protection of workers against risks relating to exposure to the chemical, physical and biological agents at work (LAW DECREE 212 of 30/07/1990) (published in: **Official Journal of the Italian Republic** no. **181** of **04/08/1990)**
- General regulations for the working hygiene (Presidential Decree 303/56 of 19/03/1956) (published in: **Ordinary Supplement of the Official Journal** no. **105** of **30/04/1956)** as amended.
- Occupational disease regulations and prospects (Presidential Decree no. 336 of 13/04/1994) (published on: Gazzetta Ufficiale Italiana no. 131 of 07/06/1994) and amendments.
- Working safety (Law Decree 626 of 19/09/94) (Implementation of Directives 89/391EEC, 89/654/EEC, 89/655/EEC, 89/656/EEC, 90/269/EEC, 90/270/EEC, 90/394/EEC and 90/679/EEC, *93/88/EEC, 97/42/CEC and 1999/38/EC* concerning the improvement of safety and health of workers *at* work) (published in: **Ordinary Supplement of the Official Journal** no. **265** of **12/11/1994**).
- Relevant incident risks (Seveso bis) (Law Decree 334 of 17/08/1999) (Implementation of Directive 96/82/EC concerning the prevention of major-accident hazards involving dangerous substances) (published in: **Ordinary Supplement of the Official Journal** no. **228** of **28/09/1999**) as amended.
- Regulations on the emissions (M.D. of 12/7/90) (Guidelines for the limitation of the emissions from the industrial facilities and the setting of the minimal values of emission) (published in: **Ordinary Supplement of the Official Journal** no. **176** of **30/07/1990**).
- Regulations on the atmospheric pollution (M.D. of 12/7/90- Guidelines for the limitation of the emissions from the industrial facilities and the setting of the minimal values of emission and of Presidential Decree of 25/07/1991- published in: **Official Journal of the Italian Republic** no. **175** of **27/07/1991**) as amended.
- Regulations on the disposal and transport of hazardous waste (Law Decree 22/97- Implementation of Directives 91/156/EEC on waste, 91/689/EEC on hazardous waste and 94/62/EC on packaging and packaging waste – published in : **Ordinary Supplement of the Official Journal** no. **38** of **15/02/1997** and Law Decree 389/97-Amendments and integrations to the Law Decree 5 February 1997, no. 22, regarding waste, hazardous waste, packaging and packaging waste – published in: **Official Journal of the Italian Republic** no. **261** of **08/11/1997**) as amended.
- Land transport regulations ADR/RID – M.D. of 4/9/1996- Implementation of Directive 94/55/EC of the Council concerning the approximation of the laws of the Member States with regard to the transport of dangerous goods by road (published in: **Ordinary Supplement of the Official Journal** no. **282** of **02/12/1996**) as amended.
- Ministerial Circulars 45 and 61 as amended.
- Consolidation act on classification, packaging and labelling of hazardous substances (with implementation of Directive EC until 22° Adaptation): M.D. of 28/4/1997 – Implementation of Article 37, paragraphs 1 and 2, of the Law Decree 3 February 1997, no. 52, concerning the classification, packaging and labelling of the hazardous substances (published in: **Ordinary Supplement of the Official Journal** no. **192** of **19/08/1997**) as amended.
- Regulations on classification, packaging and labelling of dangerous preparations (L.D. 285 of 16/07/1998- Implementation of Community Directives regarding the classification, packaging and labelling of dangerous preparations, complying with Article 38 of the Law 24 April 1998, no. 128) (published in: **Official Journal of the Italian Republic** no. **191** of **18/08/1998**) as amended.
- Implementation of 24th Adaptation EC (M.D. 175 of 07/07/1999 – Rules relating to classification, packaging and labelling of dangerous substances as implementation of Directive 98/73/EC) (published in: **Ordinary Supplement of the Official Journal** no. **226** of **25/09/1999**) as amended.
- Regulations for the compilation of the Safety Sheets (with implementation until Directive 93/112 EC) (M.D. of 4/4/97 – Implementation of Article 25, paragraphs 1 and 2 of the Law Decree 3 February 1997, no. 52, regarding the classification, packaging and labelling of dangerous substances, with regard to the safety sheet on safety) (published in : **Official Journal of the Italian Republic** n° **169** of **22/07/1997**) as amended.
- Implementation of 24th and 25th Adaptation EC (M.D. 10/04/2000 – Implementation of Directives 98/73/EC and 98/98/EC, respectively adapting to Directive 67/548/EEC for the 24th and 25th time) (published in: **Ordinary Supplement of the Official Journal** no. **205** of **02/09/2000**) as amended.
- **Directive EEC/EAEC/EC** no. **45** of **31/05/1999**
- 1999/45/EC: Directive of the European Parliament and Council, of 31 May 1999, concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to classification, packaging and labelling of dangerous preparations.
- **Ministerial Decree** of **26/01/2001-** Regulations relating to classification, packaging and labelling of dangerous substances as implementing Directive **2000/32/EC** (adapting to technical progress of Directive 67/548/EEC for the 26th time).
- **Ministerial Decree** of **11/04/2001-** Implementation of the Directive **2000/33/EC** adapting to technical progress of Directive 67/548/EEC for the 27th time, regarding the classification, packaging and labelling of dangerous substances.
- **Community Directive** 2001/59/EC of 06/08/2001, adapting to technical progress of Directive 67/548/EEC for the 28th time regarding the classification, packaging and labelling of dangerous substances.
- **Community Directive** 2001/58/EC of 27/07/01, amending for the second time Directive 91/155/EC defining and lying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 14 of Directive 1999/45/EC.
- **Law Decree** of **14 March 2003**, no. **65** – Implementation of Directives 1999/45/EC and 2001/60/EC relating to the classification, packaging and labelling of dangerous preparations.
- **Decree** of **16 January 2004**, no.**44** – Implementation of Directive 1999/13/EC on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain activities according to Article 3, paragraph 2 of the Presidential Decree of 24 May 1988, no. 203.
- **Decree 28/02/2006 –** Implementation of Directive 2004/74/EC, adapting to technical progress of Directive 67/548/EEC for the 29th time regarding the classification, packaging and labelling of dangerous substances.

- **Law Decree** of **3 April 2006**, n. **152** "Norms Concerning the Environment"
- **Regulation (CE) n. 1907/2006** of **18 December 2006** concerning registration, evaluation, authorization and restriction of chemicals (REACH) and establishing a European agency for chemicals.
- **Decree 04/02/2008 -** Implementation of Directive 2006/15/CE, which defines a second list of the occupational exposure limit values as implementation of Council Directives 98/24/CE and modifying Directives 91/322/CEE and 200/39/CE.
- **Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008** on classification, labelling and packaging of substances and misture, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No. 1907/2006.
- **Regulation (EC) No. 552/2009 of 22 June 2009** - amending Regulation (EC) No. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards Annex XVII.
- **Commission Regulation (EC) No. 790/2009 of 10 August 2009** amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No. 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures.
- **Commission Regulation (EU) N. 276/2010 of 31 March 2010** amending regulation (EC) n. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards annex XVII (dichloromethane, lamp oils, grill lighter fluids and organostannic compounds).
- **Commission Regulation (EU) no. 453/2010 of 20 May 2010**, amending Regulation (EC) no. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- **Commission Regulation (EU) No. 286/2011 of 10 March 2011** amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No. 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures.
- **Commission Regulation (EU) N. 109/2012 of 9 February 2012**, amending regulation (EC) n. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards annex XVII (CMR substances)
- **Commission Regulation (EU) N. 618/2012 of 10 July 2012,** amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) n. 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures.
- **Commission Regulation (EU) N. 126/2013 of 13 February 2013,** amending Annex XVII of Regulation (EC) n. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- **Commission Regulation (EU) N. 348/2013 of 17 April 2013** amending Annex XIV of Regulation (EC) n. 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- **Commission Regulation (EU) N. 487/2013 of 8 May 2013** amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) n. 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures.
- **Commission Regulation (EU) N. 758/2013 of 7 August 2013** amending Annex VI of Regulation (EC) n. 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures.
- **Commission Regulation (EU) No 944/2013** of **2 October 2013,** amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures
- **Directive 2014/27/EU of the European Parliament and of the Council** of **26 February 2014,** amending Council Directives 92/58/EEC, 92/85/EEC, 94/33/EC, 98/24/EC and Directive 2004/37/EC of the European Parliament and of the Council, in order to align them to Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
- **Regulation (EU) No 517/2014 of the European Parliament and of the Council** of **16 April 2014** on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006
- **Commission Regulation (EU) No 605/2014 of 5 June 2014**, amending, for the purposes of introducing hazard and precautionary statements in the Croatian language and its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures.
- **Commission Regulation (EU) No 2015/830** of **28 May 2015** amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).
- **Commission Regulation (EU) 2015/1221** of **24 July 2015** amending Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures, for the purposes of its adaptation to technical and scientific progress
- **Commission Regulation (EU) 2016/918** of **19 May 2016** amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures
- **Commission Regulation (EU) 2016/1179** of **19 July 2016** amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures
- **Commission Regulation (EU) 2017/776** of **4 May 2017** amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures
- **Commission Regulation (EU) 2017/999** of **13 June 2017** amending Annex XIV to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).

- **Commission Regulation (EU) 2018/1480** of **4 October 2018** amending, for the purposes of its adaptation to technical and scientific progress, Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures and correcting Commission Regulation (EU) 2017/776
- **Commission Regulation (EU) 2018/1513** of **10 October 2018** amending Annex XVII to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) as regards certain substances classified as carcinogenic, mutagenic or toxic for reproduction (CMR), category 1A or 1B
- **Directive (EU) 2019/130 of the European Parliament and of the Council** of **16 January 2019** amending Directive 2004/37/EC on the protection of workers from the risks related to exposure to carcinogens or mutagens at work
- **Commission Regulation (EU) 2019/521** of **27 March 2019** amending, for the purposes of its adaptation to technical and scientific progress Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures
- **Regulation (EU) 2019/1021 of the European Parliament and of the Council** of **20 June 2019** on persistent organic pollutants
- **Commission Delegated Regulation (EU) 2020/11** of **29 October 2019** amending regulation (EC) no. 1272/2008 of the European Parliament and of the Council relating to classification, labelling and packaging of substances and mixtures as regards harmonized information on emergency medical response
- **Commission Delegated Regulation (EU) 2020/1182** of **19 May 2020** amending, for the purposes of its adaptation to technical and scientific progress, Part 3 of Annex VI to Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures
- **Commission Regulation (EU) 2020/878** of **18 June 2020** amending Annex II to Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- **Commission Delegated Regulation (EU) 2020/1677** of **31 August 2020** amending Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures in order to improve the workability of information requirements related to emergency health response
- **Commission Delegated Regulation (EU) 2021/849** of **11 March 2021** amending, for the purposes of its adaptation to technical and scientific progress, Part 3 of Annex VI to Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures
- **Commission Delegated Regulation (EU) 2023/707** of **19 December 2022** amending Regulation (EC) No 1272/2008 as regards hazard classes and criteria for the classification, labelling and packaging of substances and mixtures
- **Commission Delegated Regulation (EU) 2024/197** of **19 October 2023** amending Regulation (EC) No 1272/2008 as regards the harmonised classification and labelling of certain substances
- **Regulation (EU) 2024/573 of the European Parliament and of the Council** of 7 **February 2024** on fluorinated greenhouse gases, amending Directive (EU) 2019/1937 and repealing Regulation (EU) No 517/2014
- **Commission Delegated Regulation (EU) 2024/2564** of **19 June 2024** amending Regulation (EC) No 1272/2008 of the European Parliament and of the Council as regards the harmonised classification and labelling of certain substances

Restrictions on marketing and use

Authorization and/or restrictions on use (annex XVII):

3. Liquid substances or mixtures which are regarded as dangerous in accordance with Directive 1999/45/EC or are fulfilling the criteria for any of the following hazard classes or categories set out in Annex I to Regulation (EC) No 1272/2008: (a) hazard classes 2.1 to 2.4, 2.6 and 2.7, 2.8 types A and B, 2.9, 2.10, 2.12, 2.13 categories 1 and 2, 2.14 categories 1 and 2, 2.15 types A to F; (b) hazard classes 3.1 to 3.6, 3.7 adverse effects on sexual function and fertility or on development, 3.8 effects other than narcotic effects, 3.9 and 3.10; (c) hazard class 4.1; (d) hazard class 5.1	1. Shall not be used in: — ornamental articles intended to produce light or colour effects by means of different phases, for example in ornamental lamps and ashtrays, — tricks and jokes, — games for one or more participants, or any article intended to be used as such, even with ornamental aspects, 2. Articles not complying with paragraph 1 shall not be placed on the market. 3. Shall not be placed on the market if they contain a colouring agent, unless required for fiscal reasons, or perfume, or both, if they: — can be used as fuel in decorative oil lamps for supply to the general public, and, — present an aspiration hazard and are labelled with R65 or H304, 4. Decorative oil lamps for supply to the general public shall not be placed on the market unless they conform to the European Standard on Decorative oil lamps (EN 14059) adopted by the European Committee for Standardisation (CEN). 5. Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of dangerous substances and mixtures, suppliers shall ensure, before the placing on the market, that the following

	requirements are met: (a) lamp oils, labelled with R65 or H304, intended for supply to the general public are visibly, legibly and indelibly marked as follows: 'Keep lamps filled with this liquid out of the reach of children'; and, by 1 December 2010, 'Just a sip of lamp oil — or even sucking the wick of lamps — may lead to life-threatening lung damage'; (b) grill lighter fluids, labelled with R65 or H304, intended for supply to the general public are legibly and indelibly marked by 1 December 2010 as follows: 'Just a sip of grill lighter may lead to life threatening lung damage'; (c) lamp oils and grill lighters, labelled with R65 or H304, intended for supply to the general public are packaged in black opaque containers not exceeding 1 litre by 1 December 2010. 6. No later than 1 June 2014, the Commission shall request the European Chemicals Agency to prepare a dossier, in accordance with Article 69 of the present Regulation with a view to ban, if appropriate, grill lighter fluids and fuel for decorative lamps, labelled R65 or H304, intended for supply to the general public. 7. Natural or legal persons placing on the market for the first time lamp oils and grill lighter fluids, labelled with R65 or H304, shall by 1 December 2011, and annually thereafter, provide data on alternatives to lamp oils and grill lighter fluids labelled R65 or H304 to the competent authority in the Member State concerned. Member States shall make those data available to the Commission.
40. Substances classified as flammable gases category 1 or 2, flammable liquids categories 1, 2 or 3, flammable solids category 1 or 2, substances and mixtures which, in contact with water, emit flammable gases, category 1, 2 or 3, pyrophoric liquids category 1 or pyrophoric solids category 1, regardless of whether they appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 or not	1. Shall not be used, as substance or as mixtures in aerosol dispensers where these aerosol dispensers are intended for supply to the general public for entertainment and decorative purposes such as the following: — metallic glitter intended mainly for decoration, — artificial snow and frost, — 'whoopee' cushions, — silly string aerosols, — imitation excrement, — horns for parties, — decorative flakes and foams, — artificial cobwebs, — stink bombs. 2. Without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances, suppliers shall ensure before the placing on the market that the packaging of aerosol dispensers referred to above is marked visibly, legibly and indelibly with: 'For professional users only'. 3. By way of derogation, paragraphs 1 and 2 shall not apply to the aerosol dispensers referred to Article 8 (1a) of Council Directive 75/324/EEC (2). 4. The aerosol dispensers referred to in paragraphs 1 and 2 shall not be placed on the market unless they conform to the requirements indicated.

Applicable SEVESO III – Directive
Such mixture must be entered in the storage classification summation.

15.2 - Chemical safety assessment
A Chemical Safety Assessment has been carried out for this substance.
All information contained in sections 11 and 12 are extracted from IUCLID.

SECTION 16 - Other information

Uses and restrictions : The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

SDS distribution : The information contained herein must be available to those who handle the product.

Employees shall be informed and trained according to their specific tasks in compliance with the regulations in force.

GLOSSARY OF THE HAZARD STATEMENTS REPORTED IN THE DOCUMENT
H phrases description (1272/2008)
H220-Extremely flammable gas
H280-Contains gas under pressure; may explode if heated

The information contained herein is believed to be accurate and correct based on our present state of knowledge and working experience with this product, and shall not be deemed exhaustive. It is applied to the product complying with the specifications. In case of combinations or mixtures, make sure that no new hazard may occur. It does in no way exempt the user of the product from complying with the ensemble of laws, regulations and administrative provisions concerning the product, working hygiene and safety.
This Sheet was drawn by using the program ESWIN together with the database SINTALEX.

Key/Legend

ACGIH	American Conference of Governmental Industrial Hygienists (Documentation of the Threshold Limit Values)
ADR	Accord européen relative au transport international des marchandises dangereuses par route (The European Agreement concerning the International Carriage of Dangerous Goods by Road)
ASTM	ASTM International, originally known as American Society for Testing and Materials (ASTM)
bw	Body weight
CAS	Chemical Abstracts Service (division of the American Chemical Society)
CER	European Waste Catalogue
CMR	Carcinogen, Mutagen and Reprotoxic
CONCAWE	CONservation of Clean Air and Water in Europa
CSA	Chemical Safety Assessment
CSR	Chemical Safety Report
DMEL	Derived Minimum Effect Level
DNEL	Derived No Effect Level
dw	Dry weight
EC number	European Chemical number
EC50	Effective Concentration 50 (Maximum effective concentration for 50% of Individuals)
EINECS	European Inventory of Existing Commercial Substances
EL50	Effective load, 50%
GWP	Global warming potential
IATA	International Air Transport Association
ICAO	International Civil Aviation Oragnization
IC50	Inhibitor Concentration 50 (Inhibitor Concentration for 50% of Individuals)
IMDG code	International Maritime Dangerous Good code (Codice sul Regolamento del Trasporto Marittimo)
LC50	Lethal Concentration 50 (Lethal Concentration for 50% of Individuals)
LD50	Lethal Dose 50 (Lethal Dose for 50% of Individuals)
LL50	Lethal load, 50%
LL0	Lethal load, 0%
LOAEL	Low Observed Adverse Effects Level
NIOSH/OSHA	Occupational Health Guidelines for Chemical Hazards (Registry of Toxic Effects of Chemical Substances)
NOEC	No Observed Effects Concentration
NOAEL	No Observed Adverse Effects Level
NOEL	No Observed Effects Level
OECD	Organisation for Economic Co-operation and Development
PNEC	Predicted No-Effect Concentration
PBT	Persistent, bioaccumulative and toxic
RID	Règlement concernent le trasport International ferroviaire des marchandises Dangereuses
RMM	Risk Management Measure
CNS	Central nervous system
STEL	Short term exposure limit
STOT	Specific Target Organ Toxicity
TLV	Threshold limit value (America Conference of Governmental Industrial Hygienists)
TWA	Time Weighted Average
STEL	Short trm exposure limit

UVCB	Chemical Substances of Unknown or Variable Composition, Complex Reaction Products and Biological Materials
vPvB	Very Persistent very bioaccumulative (Molto Persistente e molto Bioaccumulabile)
VOC	Volatile Organic Compounds
VwVwS	Text of Administrative Regulation on the Classification of Substances hazardous to waters into Water Hazard Classes (Verwaltungsvorschrift wassergefährdende Stoffe - VwVwS)
WAF	Water Accommodated Fraction

Abbreviations and acronyms used herein can be found in the following Webpage://www.wikipedia.org/

International Poison Control Centres

Country	Poison Centre	Address	Telephone Number	E-mail	Website
Austria	Gesundheit Österreich GmbH	Stubenring 6 1010 Wien	+43 1 515 61-0	kontakt@goeg.at	https://goeg.at/de/VIZ
Belarus	MINSK CITY EMERGENCY HOSPITAL	Kizhevatova Street , 58 Minsk 220024	+375 (17) 287-89-26	minsk.bsmp@gmail.com	http://www.bsmp.by/index.php/home
Belgium	BELGISCH ANTIGIFCENTRUM	p/a Militair hospitaal Koningin Astrid Bruynstraat 1, 1120 Brussel	+32 02 264 96 36	info@poisoncentre.be	https://www.poisoncentre.be/
Croatia	Institut za medicinska istraživanja i medicinu rada	Ksaverska cesta 2, POB 291, 10000 Zagreb	+385 1 2348 342	--	https://www.imi.hr/en/poison-control-centre/
Czech Republic	Toxikologického informačního střediska	Klinika pracovního lékařství VFN a 1. LF UK Na Bojišti 1, Praha 2	+420 224 91 92 93	tis@vfn.cz	http://www.tis-cz.cz/
Denmark	Giftlinjen	--	+45 82 12 12 12	--	https://www.bispebjerghospital.dk/giftlinjen/Sider/default.aspx
Estonia	Mürgistusteabekeskus	Paldiski mnt 81 Tallinn 10617	+372 6943 884	info@16662.ee	https://www.16662.ee/
Finland	Myrkytystietokeskus	--	+358 09 471 977	--	http://www.hus.fi/sairaanhoito/sairaanhoitopalvelut/myrkytystietokeskus/Sivut/default.aspx
France	Centre Antipoison et de Toxicovigilance de ANGERS	C.H.U 4 rue Larrey 49033 Angers Cedex 9	+33 02 41 48 21 21	cap49@chu-angers.fr	http://www.centres-antipoison.net/angers/index.html
	Centre Antipoison et de Toxicovigilance de BORDEAUX	CHU Pellegrin Tripode Place Amélie Raba Léon 33076 Bordeaux Cedex	+33 05 56 96 40 80	centre-antipoison@chu-bordeaux.fr	http://www.centres-antipoison.net/bordeaux/index.html
	Centre Antipoison et de Toxicovigilance de LILLE	C.H.R.U 5 avenue Oscar Lambret 59037 Lille Cedex	+33 0800 59 59 59 +33 03 20 44 59 62	cap@chru-lille.fr	http://cap.chru-lille.fr
	Centre Antipoison et de Toxicovigilance de LYON	Bâtiment A, 4ème étage 162, avenue Lacassagne 69424 Lyon Cedex 03	+33 04 72 11 69 11	centre.antipoison@chu-lyon.fr	http://www.centres-antipoison.net/lyon/index.html
	Centre	Hôpital Sainte	+33 04 91 75 25 25	cap-mrs@mail.ap-	http://www.centres-

	Antipoison et de Toxicovigilance de MARSEILLE	Marguerite 270 boulevard de Sainte Marguerite 13274 Marseille Cedex 09		hm.fr	antipoison.net/marseille/index.html
	Centre Antipoison et de Toxicovigilance de NANCY	Hôpital Central 29 avenue du Maréchal de Lattre de Tassigny 54035 Nancy Cedex	+33 03 83 22 50 50	cap@chu-nancy.fr	http://www.centres-antipoison.net/nancy/index.html
	Centre Antipoison et de Toxicovigilance de PARIS	Hôpital Fernand WIDAL 200 rue du Faubourg Saint Denis 75475 Paris Cedex 10	+33 01 40 05 48 48	cap.paris.lrb@aphp.fr	http://www.centres-antipoison.net/paris/index.html
	Centre Antipoison et de Toxicovigilance de STRASBOURG	Hôpitaux universitaires 1 Place de l'Hôpital BP 426 67091 Strasbourg Cedex	+33 03 88 37 37 37	Christine.TOURNOUD@chru-strasbourg.fr	http://www.centres-antipoison.net/strasbourg/index.html
	Centre Antipoison et de Toxicovigilance de TOULOUSE	Hôpital Purpan Pavillon Louis Lareng Place du Docteur Baylac 31059 Toulouse Cedex	+33 05 61 77 74 47	cap.reg@chu-toulouse.fr	http://www.centres-antipoison.net/toulouse/index.html
FYROM	ЈЗУУ Клиника за токсикологија	ул.Водњанска 17, 1000 Скопје, Македонија	+389 02 31 47 635	contact@toxicocenter.com.mk	http://www.toxicocenter.com.mk/
Germany	Giftnotruf der Charité	Charité – Universitätsmedizin Berlin Charitéplatz 1, 10117 Berlin	+49 30 19240	firmenservice(at)giftnotruf.de	https://giftnotruf.charite.de/
	Informationszentrale gegen Vergiftungen, Zentrum für Kinderheilkunde, Universitätsklinikum Bonn	Adenauerallee 119, 53113 Bonn	+49 0228 - 19240 +49 0228 287-33211	info@giftzentrale-Bonn.de	http://www.gizbonn.de/272.0.html
	Gemeinsames Giftinformations-zentrum der Länder	Gemeinsames Giftinformationszentrum der Länder Mecklenburg-Vorpommern, Sachsen, Sachsen-Anhalt und Thüringen c/o HELIOS Klinikum Erfurt Nordhäuser Straße 74 99089 Erfurt	+49 361 730730	--	https://www.ggiz-erfurt.de/home.html
	Vergiftungs-Informations-	Mathildenstr. 1 79106 Freiburg	+49 (0) 761 19240	giftinfo@uniklinik-freiburg.de	https://www.uniklinik-freiburg.de/giftberatung.h

	Zentrale Freiburg				tml
	Giftinformationszentrum-Nord	Robert-Koch-Straße 40 37075 Göttingen	+49 0551 19 240	giznord@giz-nord.de	https://www.giz-nord.de/cms/
	Informations- und Behandlungszentrum für Vergiftungen des Saarlandes	Universitätsklinikum des Saarlandes Klinik/Institut für Xxxxxx Gebäude "XX" Kirrberger Straße D-66421 Homburg	+49 06841 19240	info @uks.eu	http://www.uniklinikum-saarland.de/de/einrichtungen/kliniken_institute/kinder_und_jugendmedizin/informations_und_behandlungszentrum_fuer_vergiftungen_des_saarlandes/
	Giftinformationszentrum der Länder Rheinland-Pfalz und Hessen	Langenbeckstraße 1 Gebäude 601 55131 Mainz	+49 06131 19240	mail@giftinfo.uni-mainz.de	http://www.giftinfo.uni-mainz.de/giz/uebersicht.html
	Abteilung für Klinische Toxikologie und Giftnotruf München	Ismaninger Str. 22 81675 München	+49 089 4140 2241	tox-sekretariat@mri.tum.de	http://www.toxinfo.med.tum.de/
Greece	Poison Information Centre	Children's Hospital "P & A Kyriakou" Athens 11527	+30 2107793777	poison_ic@aglaiakyriakou.gr	http://0317.syzefxis.gov.gr/wp-content/uploads/2016/09/Site-KD-English-Version-16_9_2016.pdf
Hungary	Egészségügyi toxikológiai tájékoztatás	Nagyvárad tér 2 Budapest 1096	+36 80 20 11 99 +36 06 1 476 6464	kembizt@emmi.gov.hu	http://www.okbi.hu/
Iceland	Føroyskt - Landspítali	101 Reykjavík	+354 543 1236 +354 543 1237	billing@landspitali.is	https://www.landspitali.is/sjuklingar-adstandendur/deildir-og-thjonusta/eitrunarmidstod/
Ireland	National Poisons Information Centre	Beaumont Hospital PO Box 1297 Beaumont Road Dublin 9	+353 (01) 809 2166 +353 (01) 809 2566	--	https://www.poisons.ie/
Italy	Centro antiveleni e tossicologia	ASST Papa Giovanni XXIII Piazza OMS - Organizzazione Mondiale della Sanità, 1 24127 Bergamo	+39 800 88 3300 +39 035.267 4460	clintox@asst-pg23.it	http://www.asst-pg23.it/section/259/Tossicologia_-_Centro_antiveleni
	Centro Antiveleni	Firenze	+39 055 427 72 38	--	http://www.tox.it/index.php?option=com_content&task=view&id=39&Itemid=64
	Centro Antiveleni di Milano	ASST Grande Ospedale Metropolitano Niguarda	+39 02 66101029	cav@ospedaleniguarda.it	https://www.centroantiveleni.org/
	Centro Antiveleni del Policlinico Gemelli	Largo Agostino Gemelli 8, 00168 Roma	+39 06 3054343	--	http://www.tox.it/index.htm
	Tossicologia Clinica - Centro Antiveleni (CAV) e Antidroga	Viale del Policlinico, 155 - 00161 Roma	+39 06 49978000	--	http://cav.policlinicoumberto1.it/
Lituania	Neatidėliotina informacija	--	+370 5 236 2052 +370 687 53 378	--	http://www.tox.lt/

	apsinuodijus (*Poisoning emergency information*)				
Netherlands	Nationaal Vergiftigingen Informatie Centrum	UMC Utrecht Heidelberglaan 100 3584 CX Utrecht	+31 030 274 8888	vergiftigingen.info@umcutrecht.nl	https://www.vergiftigingen.info/f?p=300:HOME::::::
Norway	Giftinformasjonen	Norwegian Poison Information Centre	+47 22 59 13 00	--	https://helsenorge.no/Giftinformasjon
Poland	Pracownia Informacji Toksykologicznej i Analiz Laboratoryjnych	31-501 Kraków ul. Kopernika 15, III piętro, pok. 329, 330	+48 (12) 411 99 99 +48 (12) 424 83 56	oit@cm-uj.krakow.pl	http://www.oit.cm.uj.edu.pl/
	Pomorskie Centrum Toksykologii	ul. Kartuska 4/6 80-104 Gdańsk	+48 (58) 682 04 04 +48 (58) 309 83 83	pct@pctox.pl	http://www.pctox.pl/new/
Portugal	CIAV - Centro de Informação Antivenenos	Instituto Nacional de Emergência Médica Rua Almirante Barroso, 36 1000-013 Lisboa	+351 213 303 271	ciav.tox@inem.pt	https://www.inem.pt/
Slovakia	Národné toxikologické informačné centrum	NTIC Limbová 5, 833 05 Bratislava	+421 2 5477 4166 +421 2 5465 2307	ntic@ntic.sk	http://www.ntic.sk/
Slovenia	Center za klinično toksikologijo in farmakologijo	Center za klinično toksikologijo in farmakologijo Interna klinika Univerzitetni klinični center Ljubljana Zaloška cesta 7 1000 Ljubljana Slovenija	+386 01 522 52 83 +386 01 522 52 76	--	http://ktf.si/
Spain	Instituto Nacional de Toxicología	--	+34 91 562 04 20	--	http://institutodetoxicologia.justicia.es/wps/portal/intcf_internet/portada/utilidades_portal/telefono_emergencias/
Sweden	Giftinformationscentralen	171 76 STOCKHOLM	+46 10 456 6700	giftinformation@gic.se	https://giftinformation.se/
Switzerland	Tox Info Suisse	Freiestrasse 16 8032 Zürich	+41 44 251 51 51 +41 44 251 66 66	info@toxinfo.ch	https://toxinfo.ch/
Turkey	Toxicology Department and Poisons Centre	Refik Saydam Central Institute of Hygiene Cemal Gürsel Cad No. 18 Sihhiye Ankara	+90 0312 433 70 07 Emergency No +90 0312 433 70 01 or 0 800 314 7900	zehir@saglik.gov.tr	www.rshm.gov.tr/en
United Kingdom	National Poisons Information Service A service commissioned by Public Health England	NPIS Edinburgh Royal Infirmary of Edinburgh Edinburgh EH16 4SA	+44 0344 892 0111	mail@toxbase.org	http://www.npis.org/

	Edinburgh Clinical Toxicology	National Poisons Information Service Edinburgh Royal Infirmary of Edinburgh Little France Crescent Edinburgh EH16 4SA	+44 0131 242 1360	--	http://www.edinburghclinicaltoxicology.org/home/

Updated on 20-Jul-2018
Additional information on European Poison Centres is available on:
- The European Association of Poisons Centres and Clinical Toxicologists (EAPCCT):http://www.eapcct.org/index.php?page=home
- World Health Organization Directory of Poison Centres:
http://www.who.int/gho/phe/chemical_safety/poisons_centres/en/index.html

For technical information: telephone number +39 0425/91007

Revision summary:
This sheet was revised in section/s: All.
In those sections, a vertical bar (|) on the left margin indicates the changes made since the previous version. If a section is marked, but it does not point out the bar, then it indicates that the text was cancelled.

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