SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING.

1.1 Product identifier.

Product Name:	**FREEZE+ 22**
Product Code:	E145RF75022
Product type:	Liquefied gas mixture, hydrocarbons (contained in a gas cylinder/cartridge of ≤ 1 l)
UFI:	K000-W09V-X00F-T794

Description:
Liquefied gas. Organic refrigerant specifically developed to replace conventional refrigerant gases. The product consists exclusively of organic substances.

1.2 Relevant identified uses of the substance or mixture and uses advised against.
Refrigerant liquid for air conditioning. Industrial/professional use.
User: professional use only.

Uses advised against:
Any use not specified in this section or in section 7.3. Due to lack of experience or data, the supplier cannot endorse any other non-specified use.

1.3 Details of the supplier of the safety data sheet.

Company:	**Lubrilleida S.L.**
Address:	C/ Valle de Aran s/n. POL. IND. MAGI.
City:	25131 - Torre-serona
Province:	Lleida (Spain)
Telephone:	+34 973750980
E-mail:	info@freezeplus.com
Web:	www.freezeplus.com

1.4 Emergency telephone number:
+34 973750980 (Only available during office hours; Monday-Friday; 08:30-13:00; 15:30-19:00).

Toxicological Information Service (Instituto Nacional de Toxicología y Ciencias Forenses-Spain)
Telephone: +34 91 562 0420
Information available in Spanish (24/7). Intended exclusively for providing medical response in case of emergency.

Main Italian Poison Control Centres – Pavia (available 24/7):
(+39) 0382 24444 (CAV: National Centre for Toxicological Information).

In case of intoxication, contact the Poison Information Centre (CIAV) – Portugal
Telephone: (+351) 800 250 250
Medical assistance available 24 hours a day, 7 days a week.

SECTION 2: HAZARDS IDENTIFICATION.

2.1 Classification of the substance or mixture.
In accordance with Regulation (EC) No 1272/2008:
Flam. Gas 1A : Extremely flammable gas.
Press. Gas : Contains gas under pressure; may explode if heated.

2.2 Label elements.
Labelling in accordance with Regulation (EC) No 1272/2008:
Pictograms:

-Continued on next page.-

Signal Word:

Danger

Hazard statements:

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.

Precautionary statements:

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P377	Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381	In case of leakage, eliminate all ignition sources.
P410+P403	Protect from sunlight. Store in a well-ventilated place.

Additional information for the label:

Restricted to professional users only.
Do not spray on an open flame or other ignition source.
Do not pierce or burn, even after use.
Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F.

2.3 Other hazards.

The mixture does not contain substances classified as PBT (Persistent, Bioaccumulative, Toxic) ≥ 0.1%.
The mixture does not contain substances classified as vPvB (very Persistent and very Bioaccumulative) ≥ 0.1%.
The mixture does not contain substances with endocrine-disrupting properties ≥ 0.1%.
Flammable vapours may accumulate in the container.
At high concentrations, vapours may displace oxygen and cause rapid asphyxiation.
Contact with the liquid may cause cold burns or frostbite.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS.

3.1 Substances.

Not applicable.

3.2 Mixtures.

Substances posing a danger to health or the environment in accordance with the Regulation (EC) No. 1272/2008, assigned a Community exposure limit in the workplace, and classified as PBT/vPvB or included in the Candidate List (Article 59 of the REACH Regulation, SVHC):

Identifiers	Name	Concentration	(*)Classification - Regulation (EC) No 1272/2008	
			Classification	Specifics concentration limits and Acute toxicity estimate
Index No: 601-003-00-5 CAS No.: 74-98-6 EC No.: 200-827-9	[2] propane	85 - 90%	Flam. Gas 1A, H220 Press. Gas H280	-
Index No: 601-004-00-0 CAS No.: 75-28-5 EC No.: 200-857-2	[2] isobutane	10 - 15%	Flam. Gas 1A, H220 Press. Gas H280	-

The complete text of the H phrases is given in section 16 of this Safety Data Sheet.
See Regulation (EC) nº1272/2008, Annex VI, section 1.2.
[1] Substance with a European Union exposure limit in the workplace (see section 8.1).
[2] Substance with a national workplace exposure limit (see section 8.1).

SECTION 4: FIRST AID MEASURES.

4.1 Description of first aid measures.

It is recommended to move the affected person out of the exposure area.

Inhalation.

It may cause asphyxia at high concentrations. Asphyxia can lead to loss of consciousness or mobility. Take the victim into open air; keep them warm and calm. If breathing is irregular or stops, perform artificial respiration.

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Eye contact.
Remove contact lenses, if present and easy to do. Rinse eyes thoroughly with lukewarm water for at least 15–20 minutes, lifting the upper and lower eyelids, and seek medical attention. If medical attention is not immediately available, continue rinsing with plenty of water for an additional 15 minutes.

Skin contact.
Contact with a liquid that is evaporating may cause cold burns or frostbite of the skin.
In case of localized frostbite following contact with liquefied gas, rinse the affected areas with plenty of lukewarm water to thaw them for at least 15 minutes and apply a sterile dressing. Remove contaminated clothing after thoroughly soaking with water, provided it is not adhered to the skin. Do not rub the affected areas. Seek urgent medical attention.

Ingestion.
This route of exposure is unlikely. At ambient temperature and pressure, the product is in the gaseous phase; therefore, no risk of intoxication by ingestion or aspiration is expected. In case of ingestion, do not induce vomiting. Seek immediate medical advice.

4.2 Most important symptoms and effects, both acute and delayed.
Respiratory arrest. Contact with liquefied gas may cause injuries (frostbite damage) due to rapid evaporative cooling.
- Skin contact: the liquefied product may cause frostbite upon contact with skin and eyes.
- Eye contact: direct contact with eyes may cause irritation, lacrimation, and risk of frostbite.

Inhalation: exposure to high concentrations may cause narcotic effects, cardiac rhythm disturbances, oxygen deficiency leading to asphyxiation, dizziness, and nausea. Effects may include excitation, headache, dizziness, drowsiness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, respiratory failure, and death. Concentrations above 10% isobutane may cause cardiac arrhythmias.

4.3 Indication of any immediate medical attention and special treatment needed.
Seek immediate medical assistance. In case of respiratory and/or cardiac failure, administer resuscitation measures. Never give anything by mouth to an unconscious person. If the person vomits, ensure the airways are clear. Treat symptomatically. Do not administer epinephrine or derivatives.
Treatment: thaw frozen areas with lukewarm water. Do not rub the affected area. Seek immediate medical attention.

SECTION 5: FIREFIGHTING MEASURES.

In case of fire, as a general hazard, heat can cause containers to explode.
The product is Extremely flammable, it can cause or considerably worsen a fire, the necessary prevention measures should be taken and risks avoided. In case of fire, the following measures are recommended:

5.1 Extinguishing media.
Suitable extinguishing media:
Dry powder extinguisher. In case of larger fires, also alcohol-resistant foam and water spray, in accordance with the Fire Protection Installations Regulation.

Unsuitable extinguishing media:
Do not use direct water jet for extinguishing. In the presence of electrical tension, the use of water or foam as an extinguishing medium is not acceptable. Consider the risk of static electricity generation when using CO_2 extinguishers. Do not use them in areas where a flammable atmosphere may be present.

5.2 Special hazards arising from the substance or mixture.
Special risks.
Exposure to combustion or decomposition products may be hazardous to health.
During a fire, and depending on its magnitude, the following may be produced:
- Carbon monoxide, carbon dioxide
- Flammable vapours or gases
- Explosions

Explosion hazard: Heat may cause pressure build-up leading to rupture of closed containers, releasing flames and increasing the risk of burns and damage. Exposure to fire may result in the rupture or explosion of containers. Vapour, being heavier than air, may travel considerable distances to ignition sources. Containers without safety valves may explode after exposure to high temperatures. Partially filled or empty containers present the same hazards as full ones.

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5.3 Advice for firefighters.
Cool tanks, tankers, or containers near the source of heat or fire with water. Take wind direction into account. Prevent firefighting products from reaching drains, sewers, or watercourses. Follow the instructions described in the fire emergency and evacuation plan(s), if available. Remove containers from the area if it can be done without risk. Keep away from containers and continue cooling them from a safe distance. Stop the leak if it can be done safely and do not extinguish the fire until the leak has been sealed. If the fire cannot be controlled, evacuate the area and allow it to burn.

Fire protection equipment.
Depending on the magnitude of the fire, the use of heat-protective suits, self-contained breathing apparatus, gloves, protective goggles or face shields, and boots may be necessary. During firefighting and depending on the intensity and proximity to the fire, additional protective equipment such as chemical protective gloves, heat-reflective suits, or gas-tight suits may be required.

It is recommended that basic emergency equipment (e.g., fire blanket, first aid kit) be available in the workplace, in accordance with Council Directive 89/654/EEC on the minimum safety and health requirements at work.

The intervention must follow the Internal Emergency Plan (IEP) and the specific response procedures for incidents and emergency situations.

SECTION 6: ACCIDENTAL RELEASE MEASURES.

6.1 Personal precautions, protective equipment and emergency procedures.
Eliminate possible sources of ignition and static discharges; ventilate the area. Do not smoke. Avoid inhaling vapours. Isolate the area and ensure adequate ventilation. Accumulation in basements, pits, or any confined or low-lying spaces may be hazardous. Use self-contained breathing apparatus when the atmosphere is unsafe.
For exposure control and personal protective measures, see Section 8.

Personal precautions:
Isolate the hazardous area and restrict access to unauthorized personnel.
Stay away from confined or low-lying spaces where flammable and asphyxiating vapours may accumulate.
Consider the risk of potentially explosive atmospheres.

6.2 Environmental precautions.
Product not classified as hazardous to the environment; avoid any release as far as possible.
When released onto water or soil, the liquefied product undergoes instantaneous evaporation until completely in the gaseous phase, and therefore does not pose risks of aquatic or terrestrial contamination.

6.3 Methods and material for containment and cleaning up.
The liquefied material released evaporates rapidly, generating flammable and asphyxiating vapours.
Eliminate all possible sources of ignition; avoid sparks, open flames, static electricity, or smoking in the hazardous area.
Stop the leak if this can be done without risk.
Use soap foam to detect small leaks.
Do not search for leaks in the presence of flames.
Use water spray to reduce vapours.
Ensure adequate ventilation to eliminate the accumulation of gases or vapours.

In case the gas condenses:
Contain and collect the spillage with inert absorbent material (soil, sand, vermiculite, diatomaceous earth, etc.) and clean the area immediately with a suitable decontaminant. Place waste in closed and appropriate containers for disposal, in accordance with local and national regulations (see Section 13).

6.4 Reference to other sections.
For exposure control and individual protection measures, see section 8.
For later elimination of waste, follow the recommendations under section 13.
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SECTION 7: HANDLING AND STORAGE.

7.1 Precautions for safe handling.
Vapours are heavier than air and may accumulate near the ground, forming explosive mixtures. Prevent the formation of flammable or explosive concentrations and ensure levels remain below occupational exposure limits. Use only in areas free from open flames, sparks, or other ignition sources. All electrical equipment must comply with applicable explosion-protection standards.

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The product may generate static electricity; always ensure proper grounding during transfer operations. Operators must wear antistatic footwear and clothing, and conductive flooring is required. Avoid tools or equipment capable of generating sparks.

Keep containers tightly closed and handle them carefully to prevent damage. Do not drag, slide, roll, or drop cylinders. Containers must remain upright, protected from heat sources, and kept below 50°C in well-ventilated areas.

Avoid inhalation of vapours or mists during spraying and prevent contact with skin and eyes (see Section 8 for protective measures). Smoking, eating, and drinking are strictly prohibited in handling areas.

Cylinders must always retain their original supplier labels and valve protection devices. Do not attempt to refill, modify, or transfer gas between containers. Only use equipment rated for the specific pressure and temperature of this product.

Storage areas must prevent corrosion and be equipped with certified electrical installations suitable for explosive atmospheres. Handling of pressurised gases must be performed exclusively by trained and qualified personnel, in accordance with occupational health, safety, and local regulatory requirements.

7.2 Conditions for safe storage, including any incompatibilities.
Store in accordance with local regulations. Follow label instructions. Store containers between 5 and 25°C, in a dry and well-ventilated place, away from sources of heat and direct sunlight. Keep away from ignition sources, oxidizing agents and strongly acidic or alkaline materials. No smoking. Prevent access to unauthorized personnel. Do not store under conditions that may promote container corrosion. Protect containers from physical damage and inspect them periodically to ensure they remain in good condition.

Compatibility
Almost all elastomers and plastomers commonly found in refrigeration systems are compatible with hydrocarbons. Materials to be avoided due to incompatibility include EPDM rubber, natural rubbers, and silicones.

Classification and threshold amount of storage in accordance with Annex I to Directive 2012/18/EU (SEVESO III):

		Qualifying quantity (tonnes) for the application of	
Code	**Description**	**Lower-tier requirements**	**Upper-tier requirements**
P2	FLAMMABLE GASES	10	50

Do not store with the following types of products:
- Self-reactive substances and mixtures
- Organic peroxides
- Oxidizing agents
- Flammable liquids
- Flammable solids
- Pyrophoric liquids
- Pyrophoric solids
- Self-heating substances and mixtures
- Substances and mixtures which, in contact with water, emit flammable gases
- Explosives
- Acutely toxic substances and mixtures
- Substances and mixtures with chronic toxicity

7.3 Specific end use(s).
Unless otherwise specified in the previous sections, no additional specific recommendations are required for the end uses of this product. For more details on identified uses, refer to section 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION.

8.1 Control parameters.
The product does not contain substances with established occupational exposure limits at the European Union level.
The product does not contain substances with Biological Limit Values established in the EU that must be declared in this section in accordance with Annex II of Regulation (EC) No 1907/2006 (REACH).

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Occupational exposure limits at national level for the following substances:

Name	CAS Nº	Country	Limit Value OEL	ppm	mg/m³
propane	74-98-6	Spain [1]	**Eight hours**	1000	-
			Short term	-	-
isobutane Hydrocarbons, aliphatic, gaseous, C1-C4 (CAS Nº.: 74-82-8 74-84-0 74-98-6 106-97-8 75-28-5)	75-28-5	Spain [1]	**Eight hours**	1000	-
			Short term	-	-
		Portugal [2]	**Eight hours**	800	-
			Short term	1000	-

[1] According to the list of Occupational Exposure Limit Values adopted by the Spanish National Institute for Safety and Health at Work (INSST) for the year 2025.
[2] In accordance with Portuguese Standard 1796 adopted by the Portuguese Institute for Quality (and modifications). Minimum oxygen concentration at sea level shall be 19.5% by volume) (pO_2 of 19,730 Pa or 148 torr, dry air.

8.2 Exposure controls.

Measures of a technical nature:
Provide adequate ventilation, which can be achieved through effective local exhaust and a reliable general extraction system. Maintain concentrations well below the lower explosive limit. Use gas detectors when flammable gases may be released. Pressurized systems must be regularly inspected for leaks. The product must be used in closed, leak-free systems. Avoid the accumulation of electrostatic charges

Ensure proper ventilation of the area through effective local exhaust/ventilation and a general air renewal system. As a preventive measure, it is recommended to use basic CE-marked personal protective equipment (PPE). For information on PPE storage, use, cleaning, maintenance or level of protection, refer to the manufacturer's technical sheets.
The recommendations below apply to the pure product. Protective measures may vary in case of dilution, application method, or final use. To determine whether emergency showers and/or eye-wash stations are required in storage areas, consult the applicable chemical regulations. All information provided here should be considered as recommendations requiring specific evaluation by the occupational risk prevention department if additional measures are planned.

Follow good industrial hygiene practices when handling the product.
If there is a risk of contact, use protective equipment for hands, eyes, and body.
The individual protection advice below applies to high levels of exposure.
Select PPE suitable for the identified type of risk.

Respiratory protection:
Use respiratory protective equipment in the presence of dust, mists, or when occupational exposure limits are exceeded (see section 8.1).
Replace the filter immediately if the odor or taste of the contaminant is detected inside the mask.

Hand protection:
Replace gloves at the first sign of degradation.
As this product is a mixture, exact glove material resistance must be verified before use.
For continuous protection: breakthrough time > 480 minutes.
For brief contact: gloves with protection level > 2, breakthrough time > 30 minutes.
Glove selection should consider: other handled substances, physical requirements (cuts, heat, dexterity), possible material allergies, and manufacturer's instructions.

Protective clothing:
Wear protective garments (coat, coveralls, gloves, boots, apron) whenever skin contact is possible.
Wash hands before and after breaks. Change contaminated clothing.

Additional emergency measures:
Emergency shower: compliant with ANSI Z358.1, ISO 3864-1:2011, ISO 3864-4:2011 (including amendments)
Eye-wash station: compliant with DIN 12899, ISO 3864-1:2011, ISO 3864-4:2011 (including amendments)

General measures:
Eating, drinking, or smoking is prohibited in areas where the product is handled, stored, or processed.
Personnel must wash their hands and face thoroughly before consuming food, beverages, or smoking.

Environmental exposure control:
Avoid release of the product into sewage systems.
Prevent discharges into the environment. Comply with applicable European environmental regulations.

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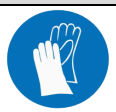
Concentration:	**100%**
Uses:	**Refrigerant liquid for air conditioning. Industrial/professional use.**
Breathing protection: Use respiratory protection if there is a possibility of gas inhalation.	
PPE:	Filter mask for protection against gases and particles. 
Characteristics:	«CE» marking, category III. The mask must have a wide field of vision and an anatomically designed form in order to be sealed and watertight.
CEN standards:	EN 136, EN 137, EN 140, EN 405, EN 14387
Maintenance:	Should not be stored in places exposed to high temperatures and damp environments before use. Special attention should be paid to the state of the inhalation and exhalation valves in the face adaptor.
Observations:	Read carefully the manufacturer's instructions regarding the equipment's use and maintenance. Attach the necessary filters to the equipment according to the specific nature of the risk (Particles and aerosols: P1-P2-P3, Gases and vapours: A-B-E-K-AX), changing them as advised by the manufacturer.
Filter Type needed:	AX
Hand protection: Use heat-insulating gloves.	
PPE:	Protective gloves against mechanical risks
Characteristics:	«CE» marking, category I. 
CEN standards:	EN 420, EN 388, EN 374-1, EN 374-2, EN 374-3
Maintenance:	Keep in a dry place, away from any sources of heat, and avoid exposure to sunlight as much as possible. Do not make any changes to the gloves that may alter their resistance, or apply paints, solvents or adhesives. The gloves, whether new or used, must be carefully inspected before use, particularly after a cleaning treatment and before putting them on, to ensure that there is no damage present. The gloves must not be left in contaminated conditions if they are to be reused, in which case the gloves must be cleaned as much as possible, provided there is no danger, before taking them off.
Observations:	Gloves should be of the appropriate size and fit the user's hand well, not being too loose or too tight. Always use with clean, dry hands.

Material:	Nitrile	Breakthrough time (min.):	> 480	Material thickness (mm):	0.35

Eye protection: When there is a risk of exposure due to liquid splashes.	
PPE:	Protective goggles with built-in frame. 
Characteristics:	«CE» marking, category II. Eye protector with built-in frame for protection against dust, smoke, fog and vapour.
CEN standards:	EN 165, EN 166, EN 167, EN 168
Maintenance:	Visibility through lenses should be ideal. Therefore, these parts should be cleaned daily. Protectors should be disinfected periodically following the manufacturer's instructions.
Observations:	Some signs of wear and tear include: yellow colouring of the lenses, superficial scratching of the lenses, scraping etc.
Skin protection: Wear flame-resistant or flame-retardant clothing. Protective clothing against liquid and gaseous chemicals, including liquid aerosols. Wear safety footwear when handling containers.	
PPE:	Anti-static protective clothing.
Characteristics:	«CE» marking, category II. Protective clothing should not be too tight or loose in order not to obstruct the user's movements. 
CEN standards:	EN ISO 13688, EN 1149-1, EN 1149-2, EN 1149-3, EN 1149-5, EN 943, EN 14116
Maintenance:	In order to guarantee uniform protection, follow the washing and maintenance instructions provided by the manufacturer.
Observations:	The protective clothing should offer a level of comfort in line with the level of protection provided in terms of the hazard against which it protects, bearing in mind environmental conditions, the user's level of activity and the expected time of use.
PPE:	Anti-static safety footwear.
Characteristics:	«CE» marking, category II. 
CEN standards:	EN ISO 13287, EN ISO 20344, EN ISO 20346, EN 20345
Maintenance:	The footwear should be checked regularly
Observations:	The level of comfort during use and acceptability are factors that are assessed very differently depending on the user. Therefore, it is advisable to try on different footwear models and, if possible, different widths.

Personal protective equipment must be determined as part of a risk assessment, considering the specific processing conditions (e.g., heating, dust generation, cleaning operations, etc.).

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES.

9.1 Information on basic physical and chemical properties.
Appearance:
Physical state (20°C): Liquid (liquefied gas).
Colour: Colourless.
Odour: Sweetish. Odourless at low concentrations.
Odour threshold: N.D.; propane 5000 and 20000 ppm (GESTIS).

Volatility:
Boiling point or initial boiling point and boiling range: N.D.; isobutane -11.7ºC; propane -42.1ºC.
Vapour pressure: N.D.; isobutane 3.0 bar (20ºC), 6.7 bar (50ºC); propane 8.3 bar (20ºC), 17.2 bar (50ºC) (ECHA).
Vapour density (air=1): N.D.; isobutane 2.01–2.07; propane 1.55–1.56.
Evaporation rate (butyl acetate=1): N.D.

Flammability:
Flammability: Extremely flammable gas.
Lower explosion limit: N.D.; isobutane 1.5–1.8 % vol.; propane 1.7–2.1 % vol.
Upper explosion limit: N.D.; isobutane 8.4–9.4 % vol.; propane 9.5–10.8 % vol.
Flash point: N.D.; isobutane -82 to -83ºC; propane -104 ºC.
Auto-ignition temperature: N.D.; isobutane 460ºC; propane 460–470ºC.

Product characteristics:
Melting/freezing point: N.D.; isobutane -182.4 to -138.3ºC; propane -187.7ºC.
Decomposition temperature: N.D.
pH: N.D.
Kinematic viscosity (40 ºC): N.D.
Dynamic viscosity: N.D.; isobutane 0.238 mPa·s (-10ºC).
Solubility: slightly soluble in water. Soluble in alcohol, ether, chloroform.
Hydrosolubility: slightly soluble. Isobutane 48.9–54 mg/L at 25 ºC; propane < 0.1 g/l at 20ºC.
Liposolubility: very good miscibility with all types of lubricants.
Partition coefficient (n-octanol/water) (logarithmic value): Not applicable for gases and gas mixtures; isobutane log Kow 2.76; propane log Kow 1.09–2.36.
Absolute density: N.D.
Relative density (water = 1): N.D.; isobutane 0.59; propane 0.58.

Particle characteristics:
Granulometry: Liquefied gas, liquid product. Contains no solids or nanoparticles.

N.D./N.A. = Not Determined-not available/Not Applicable due to the nature of the product. Not relevant due to the nature of the product, as it does not provide characteristic information regarding its hazardous properties.

9.2 Other information
Explosive properties: Not explosive according to CLP classification criteria.
The vapour is heavier than air and may accumulate in confined spaces, particularly at ground level or in basements.
Vapours may form explosive mixtures with air.

Oxidising properties: Not oxidising according to CLP classification criteria.

Drop point: N.D.
Spark ignition: N.D.
% Solids: liquefied gas, not relevant for this type of product.
Critical temperature: N.D.; isobutane 135ºC; propane 96.5–96.8ºC (GESTIS).
Critical pressure: N.D.; isobutane 36.5–37.2 bar; propane 42.48–42.60 bar (GESTIS).

N.D./N.A. = Not Determined-not available/Not Applicable due to the nature of the product. Not relevant due to the nature of the product, as it does not provide characteristic information regarding its hazardous properties.
For further information, refer to the product technical data sheet.

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SECTION 10: STABILITY AND REACTIVITY.

10.1 Reactivity.
The product does not present hazards due to reactivity under the recommended handling and storage conditions (see Section 7).
Extremely flammable gas.
Contains gas under pressure; may explode if heated.
High risk of explosion from shock, friction, fire, or other sources of ignition.

10.2 Chemical stability.
Stable under the recommended handling and storage conditions (see Section 7).
Extremely flammable and combustible gas.

10.3 Possibility of hazardous reactions.
Contains gas under pressure; may explode if heated.
Extremely flammable gas.
May form potentially explosive atmospheres in air. May react violently with oxidising materials.

10.4 Conditions to avoid.
Avoid any improper handling, sources of heat/ignition, flames, hot surfaces, and smoking.
Avoid static electricity discharges, extremely high or low temperatures.
Avoid contact with the liquefied product and inhalation of the gas.
Pressurised container. Do not pierce or burn, even after use.
Do not expose to direct sunlight. Do not expose to temperatures exceeding 50°C.
Keep away from incompatible materials

10.5 Incompatible materials.
Keep away from oxidising agents and strongly alkaline/basic or acidic materials to avoid exothermic reactions.
Air/oxygen. Combustible materials. Halogens. Nitrates. Nitrites. Chlorites. Inorganic chlorides. Perchlorates.

10.6 Hazardous decomposition products.
Does not decompose if used for the intended purposes.
During a fire, and depending on its magnitude, the following may be produced:
- Carbon monoxide, carbon dioxide
- Flammable vapours or gases
- Explosions

Explosion hazard: Heat may cause pressure build-up leading to rupture of closed containers, releasing fire and increasing the risk of burns and damage. Exposure to fire may cause container rupture or explosion.

SECTION 11: TOXICOLOGICAL INFORMATION.

The classification of this product has been carried out using the conventional calculation method in accordance with Regulation (EC) No. 1272/2008 (CLP), extrapolation with similar products, and expert judgment.

11.1 Information on hazard classes as defined in Regulation (EC) Nº 1272/2008.
No tested data are available for the product.

Main route of exposure:
The routes of entry for solids and liquids are ingestion and inhalation, but may also include eye or skin contact. The routes of entry for gases are inhalation and eye contact.

a) acute toxicity;
Based on the available data, the classification criteria are not met.
Petroleum gases are flammable gases at ambient temperature and are therefore exempt from the requirement for acute oral and dermal toxicity data in accordance with Annex XI of REACH. Gases in this category show low acute inhalation toxicity (ECHA).
Pulmonary absorption occurs only to a limited extent for short-chain, branched aliphatic hydrocarbons.

Information on substances:
Isobutane
- LC50 (Rat, 10–15 min): > 800,000 ppm (ECHA)
- LC50 (Rat, inhalation): 570,000 ppm. Exposure time: 15 min. (Test atmosphere: Gas) (External SDS)

Propane
- LC50, rats > 800,000 ppm (equivalent to 1,442,738 mg/m³ or 1443 mg/l) (ECHA)
- LC50 (Rat, inhalation): > 280,000 ppm (External SDS, literature)

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b) skin corrosion/irritation;
Inconclusive data for classification. Contact with liquefied gas may cause frostbite.
In one study, 125 volunteers used a deodorant containing 65–70% by weight of propane/isobutane twice daily for 12 weeks. No skin irritation was observed (GESTIS, HSDB Database Search 2004).

c) serious eye damage/irritation;
Inconclusive data for classification. Contact with liquefied gas may cause frostbite.

d) respiratory or skin sensitisation;
Inconclusive data for classification.
In accordance with Section 2 of Annex XI of REACH, skin sensitisation studies are not required, as petroleum gases are flammable gases at ambient temperature. No skin sensitisation studies have been conducted, and repeated-dose studies or published literature do not indicate that any of these gases cause skin sensitisation (ECHA).

e) germ cell mutagenicity;
Not conclusive data for classification.

f) carcinogenicity;
Based on the available data, the classification criteria are not met.
IARC: no substance present in this mixture at ≥ 0.1% is listed.

g) reproductive toxicity;
Not conclusive data for classification.

Information on substances:
Isobutane
Effects on fertility, inhalation: NOEC (rats, 6 weeks): 7131 mg/m³ (3000 ppm) (ECHA).

Propane
Effects on fertility, inhalation: NOEC (rats, 6 weeks): 21641 mg/m³ (12000 ppm) (ECHA).

h) STOT-single exposure;
Not conclusive data for classification.

i) STOT-repeated exposure;
Based on the available data, the classification criteria are not met.
The category of petroleum gases shows low subchronic toxicity via the inhalation route. No significant toxicological effects related to exposure, nor target organ toxicity, have been observed in inhalation studies of up to 90 days for C2–C4 alkanes, as well as for Liquefied Petroleum Gas, whose composition is mainly propane and propene.
NOAEC (rat, inhalation, systemic effects with repeated dose): 4437 mg/m³.

Information on substances:
Isobutane
- NOAEL (No Observed Adverse Effect Level) (Rat, inhalation, 13 weeks): 10,000 ppm inhalation (ECHA).
- NOAEC: 9,000 ppm (21,394 mg/m³), 6 weeks, rats, inhalation. Highest exposure level tested and 50% of the lower explosive limit (HLS 2010) (ECHA).

Propane:
- LOAEC (4 weeks, rats, inhalation): 12,000 ppm (21,641 mg/m³).
- NOAEC: 4,000 ppm (7,214 mg/m³), highest exposure level tested and 50% of the lower explosive limit (HLS 2009) (ECHA).

j) aspiration hazard;
Not applicable to gases and gas mixtures.

11.2 Information on other hazards.
Endocrine disrupting properties
The mixture does not contain components considered to have endocrine-disrupting properties in accordance with Article 57(f) of the REACH Regulation, Commission Delegated Regulation (EU) 2017/2100, or Commission Regulation (EU) 2018/605, at concentrations equal to or greater than 0.1%.
Other information
There is no information available on other adverse health effects.

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SECTION 12: ECOLOGICAL INFORMATION.

The classification of this product has been carried out using the conventional calculation method in accordance with Regulation (EC) No. 1272/2008 (CLP), extrapolation with similar products, and expert judgment.

Petroleum gases are expected to be distributed predominantly into the atmosphere. Based on QSAR estimations, the components of this category are readily biodegradable. For this reason, no data are required regarding biodegradation in water, sediments, or soil streams.
Structural analysis of the streams indicates that hydrolysis is not expected due to the absence of hydrolysable functional groups. Due to the low log Kow, petroleum gases are expected to have a low potential for bioaccumulation and adsorption (ECHA).

12.1 Toxicity.
This product is not classified as hazardous to the environment according to the classification criteria of the CLP Regulation.
Due to their high volatility and low solubility, LPGs do not pose risks of aquatic or terrestrial contamination. Propane and isobutane are atmospheric pollutants present in urban areas, originating mainly from vehicle fuel tanks.

Information on substances:
Isobutane
- Acute toxicity – Fish: LC50 (96 h): 24.11 mg/l (QSAR, ECHA)
- Acute toxicity – Aquatic invertebrates: LC50 (Daphnia, 48 h): 14.22 mg/l (QSAR, ECHA)
- EC50, crustaceans: 7.02 – 69.43 mg/l (External SDS, Quantitative Structure–Activity Relationship (QSAR))

Propane
- LC50 / 96 h / Fish: 147.54 mg/l (External SDS)
- EC50 / 48 h / Daphnia: 69.43 mg/l (External SDS)

12.2 Persistence and degradability.
Not applicable to gases and gas mixtures.
The product volatilizes rapidly and enters the gaseous phase at ambient temperature; therefore, information on its persistence and degradability is not relevant.
When released into the environment, LPG undergoes intense evaporation. The product is biodegradable in soil. At ambient temperature, LPG is in the gaseous phase in the atmosphere, where it is degraded by chemical reactions, with a half-life of 6.9 days. The product is expected to be biodegradable and not to persist in the aquatic environment for prolonged periods.

Information on substances
Isobutane
- Readily biodegradable: 100% (385.5 h) Detected in water (ECHA). Bioaccumulation unlikely.

Propane
- Readily biodegradable. Bioaccumulation unlikely. Persistence unlikely.

12.3 Bioaccumulative potential.
Information about the bioaccumulation of the substances present.

Name	Bioaccumulation			
	Log Pow	BCF	NOECs	Level
propane CAS No: 74-98-6 EC No: 200-827-9	1.09-2.36	-	-	Low
isobutane CAS No: 75-28-5 EC No: 200-857-2	2.76-3.42	-	-	Low

Bioaccumulation is unlikely.
No issues of bioaccumulation or impact on the food chain are expected. The product has a low bioconcentration factor (BCF) and a log Kow < 4.

12.4 Mobility in soil.
No information is available regarding mobility in soil.
Soil or water contamination is unlikely due to the high volatility of the product.

12.5 Results of PBT and vPvB assessment.
The mixture does not contain substances classified as PBT (Persistent, Bioaccumulative and Toxic) ≥ 0.1%.
The mixture does not contain substances classified as vPvB (very Persistent and very Bioaccumulative) ≥ 0.1%.

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12.6 Endocrine disrupting properties.
This product does not contain substances with endocrine disrupting properties for the environment ≥ 0.1%

12.7 Other adverse effects.
The product is not affected by the Regulation (EU) 2024/590 of the European Parliament and of the Council of 7 February 2024 on substances that deplete the ozone layer.
It does not contain any substance included in the POP list (Regulation (EU) 2019/1021 on persistent organic pollutants).

Information on substances:

Isobutane
Global warming potential: 3 (relative to the value of 1 for carbon dioxide over 100 years)
Ozone depletion potential: 0

Propane
Global warming potential: 3 (relative to the value of 1 for carbon dioxide over 100 years)
Ozone depletion potential: 0

Contains greenhouse gas(es). If released in large quantities, it may contribute to the greenhouse effect.
Does not contain fluorinated greenhouse gases

SECTION 13: DISPOSAL CONSIDERATIONS.

13.1 Waste treatment methods.
Dispose of the container through the supplier. Transport, unloading, treatment, or disposal activities may be subject to additional local/national legislation. Waste and empty containers must be handled and disposed of in accordance with applicable local/national regulations. Follow the provisions of Directive 2008/98/EC on waste management.
Discharge into sewers or watercourses is not permitted.
Flammable vapours may accumulate in the container.

Waste management (disposal and recovery):
Consult an authorised waste disposal company regarding proper recovery and disposal operations. If the container has been in direct contact with the product, it must be treated as hazardous waste. If not, it may be handled as non-hazardous waste. Discharge into watercourses is not recommended. See Section 6.2.

Relevant EU legislation:
In accordance with Annex II of Regulation (EC) Nº1907/2006 (REACH), the following EU legislation applies to waste management:

- Directive 2008/98/EC on waste (Waste Framework Directive)
- Decision 2014/955/EU (European List of Waste)
- Directive (EU) 2018/851 (amending the Waste Framework Directive)
- Directive (EU) 2019/904 (on the reduction of the impact of certain plastic products)
- Regulation (EU) No 1357/2014 on waste classification (hazardous waste properties)

EWC code (European Waste Catalogue):
Waste classification according to the European Waste Catalogue:
16 WASTES NOT OTHERWISE SPECIFIED IN THE LIST
16 05 gases in pressure containers and discarded chemicals
16 05 04 gases in pressure containers (including halons) containing hazardous substances
Waste classified as hazardous.

SECTION 14: TRANSPORT INFORMATION.

Transport following ADR rules for road transport, RID rules for railway, ADN for inner waterways, IMDG for sea, and ICAO/IATA for air transport.
Land: Transport by road: ADR, Transport by rail: RID.
Transport documentation: Consignment note and written instructions
Sea: Transport by ship: IMDG.
Transport documentation: Bill of lading
Air: Transport by plane: ICAO/IATA.
Transport document: Airway bill.

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14.1 UN number or ID number.
UN No: UN2037

14.2 UN proper shipping name.
Description:
ADR/RID: UN 2037, RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), 2.1, (D)
IMDG: UN 2037, RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), 2.1
ICAO/IATA: UN 2037, RECEPTACLES, SMALL, CONTAINING GAS (GAS CARTRIDGES), 2.1

14.3 Transport hazard class(es).
Class(es): 2
Classification code (ADR): 5F

14.4 Packing group.
Packing group: Not applicable.

14.5 Environmental hazards.
Marine pollutant: No
Transport by ship, FEm – Emergency sheets (F – Fire, S - Spills): F-D,S-U

14.6 Special precautions for user.
Labels: 2.1

Hazard number: Not applicable.
Provisions concerning carriage in bulk ADR: Not authorized carriage in bulk in accordance with ADR.
Proceed in accordance with point 6.
ADR LQ: 1 L
IMDG LQ: 1 L (SP277)
ICAO LQ: 1 kg (Y203)

14.7 Maritime transport in bulk according to IMO instruments.
The product is not subject to bulk transport by sea.

SECTION 15: REGULATORY INFORMATION.

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

Volatile organic compound (VOC)
VOC content (p/p): 100%

The product is not subject to Regulation (EU) No 528/2012 concerning the making available on the market and use of biocidal products.
The product is not subject to the procedure established Regulation (EU) No 649/2012, concerning the export and import of dangerous chemicals.

REACH Annex XIV (Authorisation List):
Does not contain any substance/use included in Annex XIV of REACH.

REACH Candidate List of Substances of Very High Concern (SVHC):
Does not contain any substance included in the REACH Candidate List.

REACH Annex XVII (Restriction List):
Not intended for uses subject to restrictions under Annex XVII of REACH. Entries 3, 40.

Specific provisions concerning the protection of human health or the environment:
It is recommended to use the information provided in this Safety Data Sheet as input data for a risk assessment based on local conditions, to determine the necessary preventive measures for the handling, use, storage, and disposal of this product.

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15.2 Chemical safety assessment.
A chemical safety assessment is not required for this mixture, as it does not contain substances that require registration, or they have already been registered by suppliers in accordance with Regulation (EC) No 1907/2006 (REACH).

SECTION 16: OTHER INFORMATION.

Legislation related to safety data sheets:
The Safety Data Sheet (SDS) shall be supplied in an official language of the country where the product is placed on the market.
This SDS has been prepared in accordance with Annex II of Regulation (EC) Nº1907/2006 (REACH), as amended by Commission Regulation (EU) 2020/878.

Complete text of the H phrases that appear in section 3:
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.

Classification codes:
Flam. Gas 1A: Flammable gas, Category 1A
Press. Gas: Gases under pressure, Liquefied

Version history:
Version 1. Revision date: 12/01/2024. Initial edition.
Version 2.0 Revision date: 04/06/2024. Update, general review. Relevant changes:
- Change in the emergency telephone number (SECTION 1.4).
- Change in hazard classification (SECTION 2.1).
- Removal of precautionary statements/hazard statements/pictograms/signal word (SECTION 2.2).
- Modifications in first aid measures (SECTION 4).
- Modification in firefighting measures (SECTION 5).
- Modifications in handling and storage precautions (SECTION 7).
- Modifications of personal protective equipment and exposure controls (SECTION 8).
- Modification in the values of physicochemical properties (SECTION 9).
- Modification of information on stability and reactivity conditions (SECTION 10).
- Toxicological data (SECTION 11).
- Ecological data (SECTION 12).
- National legislative changes (SECTION 15.1)

Version 2.1 Revision date: 01/10/2025. Update, general review. Relevant changes:
- Regulation (SECTION 12.7)
- Exposure limit values (SECTION 8).

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]:

Physical hazards	According to data obtained from tests/literature
Health hazards	Calculation method
Environmental hazards	Calculation method

Other information
No specific experimental studies are available for this product. The information provided is based on knowledge of the individual components, and the product classification has been determined by calculation method.
It is advisable to carry out basic training with regard to health and safety at work in order to handle this product correctly.

Abbreviations and acronyms used:
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE: Acute Toxicity Estimate
AwSV: German Ordinance on Facilities Handling Substances Hazardous to Water
BCF: Bioconcentration Factor
CAS: Chemical Abstracts Service Number
CEN: European Committee for Standardization
CLP: Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
DMEL: Derived Minimal Effect Level, exposure level corresponding to a low risk, that risk should be considered a tolerable minimum.
DNEL: Derived No Effect Level, level of exposure to the substance below which adverse effects are not anticipated.
EC50: Effective Concentration 50/ Half maximal effective concentration.
EN: European Standard
PPE: Personal Protective Equipment
IARC: International Agency for Research on Cancer

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IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
IMDG: International Maritime Dangerous Goods Code
LC50: Lethal Concentration for 50% of the test population
LD50: Lethal Dose for 50% of the test population
LOAEC: Lowest Observed Adverse Effect Concentration.
LOAEL: Lowest Observed Adverse Effect Level
NOAEL: No Observed Adverse Effect Level
NOEC: No Observed Effect Concentration
OECD: Organisation for Economic Co-operation and Development
OEL/TWA: Occupational Exposure Limit / Time-Weighted Average
PNEC: Predicted No Effect Concentration, concentration of the substance below which adverse effects are not expected in the environmental compartment.
RID: Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS: Safety Data Sheet
UFI: Unique Formula Identifier
WGK: Water Hazard Class (German system)

Key literature references and sources for data:
http://eur-lex.europa.eu/homepage.html
http://echa.europa.eu/
Regulation (EU) Nº2020/878.
Regulation (EC) Nº1907/2006.
Regulation (EC) Nº1272/2008.
Safety Data Sheet of the raw material supplier.
GESTIS SUBSTANCE DATABASE.

The information given in this Safety Data Sheet has been drafted in accordance with 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 on the Registration, Evaluation, Authorisation and Restriction of Chemical substances and mixtures (REACH).

The information in this Safety Data Sheet on the Preparation is based on current knowledge and on current EC and national laws, as far as the working conditions of the users are beyond our knowledge and control. The product must not be used for purposes other than those specified without prior written instructions for handling. It is always the responsibility of the user to take the appropriate measures to comply with the requirements established by current legislation. The information contained in this Safety Sheet only states a description of the safety requirements for the preparation, and it must not be considered as a guarantee of its properties.

-End of safety data sheet.-