

Safety Data Sheet

In compliance with Regulation (EU) No. 830/2015
 SDS Revision date: 03/10/2020
 Replaces the SDS: Rev. 06 of 13/11/2018

SDS edition: Revision 07

GTS SPRAY - GTS MULTIAPP

SECTION 1: Identification of the substance or mixture and of the company/firm

1.1 Product identifier

Product type:	Mixture
Commercial name:	Range of GTS SPRAY Mixtures, Range of GTS MULTI-APP Mixtures
Other names:	Liquefied petroleum gas; Mixture A, A01, A02, A0, A1, B1, B2, B and C*; LPG; Mixture of Hydrocarbons C3-4; Propane / Butane mixture; Propane / Isobutane / Butane mixture
Name of the substance / mixture	Liquefied Petroleum Gas
INCI nomenclature:	Propane / Isobutane / Butane
CAS number:	N/A (mixture)
EEC number:	N/A (mixture)
Index number:	N/A (mixture)
Registration number:	N/A (mixture)
UFI code:	S2U5-D0A9-H00J-R6F4

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

1.2 Relevant identified uses of the substance and of the mixture and contraindications

Relevant identified uses:	Industrial use:	Production, distribution, formulation, expanding agent, use as fuel/combustible, use as functional fluid, use in the production of polymers, use in the processing of polymers, use as a propellant gas.
	Professional use:	Use as fuel, use as functional fluid, use in the processing of polymers, use as a propellant gas.
	Consumer:	Use as fuel.

Contraindications: It is recommended to use the substances / mixture only in the cases indicated previously. No other uses are recommended unless an evaluation has been conducted, prior to the start of the said use, that demonstrates that the risks associated with such uses are under control.

1.3 Information on the supplier of the safety data sheet

Name of Business:	GTS Spa
Address:	Via G. D'Annunzio, 2/75
City / Country:	16121 Genoa (Italy)
Phone:	+39 010 5955981 (office hours)
Director:	Davide Vattuone
e-mail:	sds.gts@gruppoautogas.com

1.4 Emergency telephone number

Bergamo:	USSA Clinical Toxicology - 24/7	United Hospitals of Bergamo Largo Barozzi, 1 Toll-free number 800 883300
Genoa:	Poison control centre - 24/7 San Martino Hospital	Largo Rosanna Benzi, 10 Phone: +0039 10352808
Milan:	Poison control centre - 24/7 Riguarda Ca'Granda Hospital	Piazza Ospedale Maggiore, 3 Phone: +0039 26610102

Note: See Section 16 for a list of poison control centres in Italy

SECTION 2: Indication of hazards

2.1 Classification of the substance and of the mixture

Classification according to the (EC) n. 1272/2008 [EU-GHS / CLP] regulation

Flammable gas, cat. 1 A:	H220
Liquefied gas under pressure:	H280

Adverse physicochemical effects on human health and the environment

High concentration of asphyxiating gas. Extremely flammable. Cryogenic gas. When in contact with the skin, it can cause cold burns or frostbite. Vapours can form an inflammable and explosive atmosphere. High concentrations of vapours can cause: migraines, nausea, dizziness. Rapid

Safety Data Sheet

In compliance with Regulation (EU) No. 830/2015
 SDS Revision date: 03/10/2020
 Replaces the SDS: Rev. 06 of 13/11/2018

SDS edition: Revision 07

GTS SPRAY - GTS MULTIAPP

accidental evaporation of liquid can cause cold burns.

Classification according to the (EC) n. 1272/2008 [EU-GHS / CLP] regulation

Hazard pictograms (CLP):



GHS02 (Flammable gases, hazard category 1 A)



GHS04 (Gas under pressure: liquefied gas)

CLP warning: Hazard
 Hazard Indications (CLP): H220 - Highly Flammable Gas.
 H280 - Contains gas under pressure; may explode if heated.
 Safety advice (CLP): P102 - Keep out of reach of children.
 P210 - Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
 P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped without risk.
 P381 - In case of leakage, eliminate all ignition sources.
 P410 + P403 - Store in a well-ventilated place and keep away from sunlight.

Other:

General Directions: Not Applicable - Classified as dangerous according to (EC) n. 1272/2008

2.2 Other hazards

Physical / Chemical: A static charge may accumulate if the material slides or is shaken and can be ignited by an electrostatic discharge.
 Health: Simple asphyxiating gas in normal temperature and pressure conditions. In the event of accidental leakage, the liquid evaporates quickly absorbing heat, and the rapid cooling of any surfaces in contact with the liquid can cause cold burns. Accidental contact or prolonged exposure to vapours can cause redness and irritation of the eyes. Exposure to high concentrations of vapours, particularly in closed environments or in poorly ventilated areas, can cause irritation to the respiratory tract, nausea, discomfort and dizziness
 Environment: None
 Contaminants: None

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

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

SECTION 3: Composition / information about ingredients

3.1 Substance

Not applicable.

3.2 Mixtures

Name of the substance	CAS Num.	EINECS Num.	REACH Num.	% (m/m)	Classification according to the (EC) n. 1272/2008 [EU-GHS / CLP] regulation
Propane	74-98-6	200-827-9	01-2119486944-21-XXXX	0 - 100	Flammable gas, cat. 1 H220 Gas under pressure H280
N-butane	106-97-8	203-448-7	01-2119474691-32-XXXX	0 - 100	Flammable gas, cat. 1 H220 Gas under pressure H280
Isobutane	75-28-5	200-857-2	01-2119485395-27-XXXX	0 - 100	Flammable gas, cat. 1 H220 Gas under pressure H280
1.3-Butadiene	106-99-0	203-450-8	N/A	<0.1	Flam. gas, cat. 1 H220; Gas under pressure H280; Carc. 1A, H350; Mutag. 1B, H340;

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

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

GWP = 1

DOES NOT CONTAIN CLASSIFIED SUBSTANCES: Xn - Xi - C - T

GTS SPRAY - GTS MULTIAPP

SECTION 4: First aid measures

4.1 Description of first aid measures

Description of first aid measures in case of inhalation:	Gaseous product: Take the victim to an uncontaminated area. If the victim is breathing: Take the person to a well-ventilated area, keep them warm and allow them to rest. Keep in a lateral safety position. If breathing is difficult, give oxygen if possible, or provide assisted ventilation. Consult a doctor if breathing difficulties persist. If the victim is unconscious and is not breathing: ensure there are no obstacles preventing the victim from breathing and perform artificial respiration by competent personnel. If necessary, perform an external cardiac massage and consult a doctor. A large quantity of LPG (liquefied petroleum gas) vapours can lead to a lack of oxygen in the atmosphere. In this case, use a self-contained breathing apparatus only.
Description of first aid measures in case of contact with the skin:	Liquid product: Rinse the skin with plenty of water. Consult a doctor immediately if irritation, swelling or redness develops and persists. Rapid accidental evaporation of liquid can cause cold burns. In the presence of frostbite symptoms, such as whitening or redness of the skin or a burning or tingling sensation, do not rub, massage or compress the injured area. Consult a specialist doctor or transfer the victim to a hospital.
Description of first aid measures in case of contact with the eyes:	Rinse gently with water for a few minutes. Remove contact lenses, if present, and if the situation allows the operation to be carried out easily. In case of irritation, blurred vision or persistent swelling, consult a medical specialist. In the presence of persistent symptoms of frostbite, such as pain, tingling, tearing or photophobia, or in case of damage caused by high pressure jets, transfer the patient to a specialist health centre. In the case of cold burns from LPG (liquefied petroleum gas) that involve the eyes, prepare for the immediate hospitalization of the victim.
Description of first aid measures in case of ingestion:	Liquid product: Not considered as a probable source of exposure. Symptoms of frostbite may occur on the lips and on the mouth in case of contact with the product in liquid form. Consult a doctor / medical service immediately.

4.2 Main symptoms and effects, both acute and delayed

Symptoms / side effects in case of inhalation:	Exposure to high concentrations of vapours, particularly in closed environments or in poorly ventilated areas, can cause irritation to the respiratory tract, nausea, discomfort and dizziness. The lack of oxygen due to exposure to high concentrations can cause asphyxia.
Symptoms / wounds in case of contact with the skin:	Contact with the liquid can cause cold burns.
Symptoms / wounds in case of contact with the eyes:	Contact with eyes may cause slight transient irritation.
Symptoms / wounds in case of ingestion:	Not applicable.
Symptoms / wounds in case of intravenous administration:	No information available.
Chronic symptoms:	None to be highlighted, according to the current classification criteria.

4.3 Indication of any need to immediately consult a doctor or the need for special treatments

In case of injuries caused by high pressure, immediately transfer the victim to the hospital. Do not wait for symptoms to appear. Immediately begin artificial respiration if breathing has stopped. Administer oxygen if necessary.

SECTION 5: Fire fighting measures

5.1 Fire fighting

Suitable extinguishing agent:	In the event of large fires: fractionated water jet, atomised water, foam. In case of small fires: dry chemical powder, carbon dioxide, foam.
Unsuitable fire fighting mediums:	Avoid the simultaneous use of foam and water on the same surface, as water destroys the foam. Do not use direct water jets on the burning product.

5.2 Special hazards deriving from the substance or mixture

Fire hazard:	Highly Flammable Gas.
Explosion hazard:	Vapours are heavier than air, they can expand over the ground and form an explosive atmosphere. Heat can cause increased pressure in tanks exposed to fire, resulting in an explosion of closed containers, spreading of the fire and a risk of burns and injury.
Combustion products:	Incomplete combustion generates carbon monoxide and carbon dioxide, poisonous to animals, and other toxic gases, oxygenated compounds (aldehydes, etc.).

5.3 Recommendations for fire-fighters

Precautionary measures in case If security conditions permit, stop or contain the leak at the source. Do not attempt to extinguish the fire

Safety Data Sheet

In compliance with Regulation (EU) No. 830/2015
 SDS Revision date: 03/10/2020
 Replaces the SDS: Rev. 06 of 13/11/2018

SDS edition: Revision 07

GTS SPRAY - GTS MULTIAPP

of fire:	until the leak has been contained, or you are sure someone is already taking the necessary actions.
Instructions for extinction:	Keep undamaged containers away from the danger area, if this can be done without danger. Use water jets to cool surfaces and containers exposed to flames or heat. If the fire cannot be controlled, evacuate the area.
Special equipment for fire-fighters:	In the event of a fire or in confined or poorly ventilated spaces, wear a garment complete with fireproof protection and a self-contained breathing apparatus with a positive pressure face mask. Personal protective equipment for fire-fighters (see also section 8). EN 443. EN 469. EN 659.
Other information (fire fighting):	In case of fire, do not dispose of waste water, residual product and other contaminated materials, but collect separately and treat appropriately.

SECTION 6: Measures in case of accidental leak

6.1 Personal precautions, protective equipment and emergency procedures

General measures: If security conditions permit, stop or contain the leak at the source. Avoid direct contact with the leaked material. Make sure to stay upwind. In case of large spills, warn residents of the area downwind of the spill. Eliminate all ignition sources if the safety conditions allow (e.g. electricity, sparks, fires, torches). Use only spark-proof tools. Gas / vapours heavier than air. They 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 those who do not intervene directly

Protection measures: See Section 8.
 Emergency procedures: Evacuate any personnel not involved from the area where the leak occurred. Notify emergency teams. Except in the case of small leaks, the feasibility of interventions must always be evaluated and approved, if possible, by qualified and competent personnel in charge of managing the emergency.

6.1.2 For those who do intervene directly

Protection measures: Small spills: normal antistatic work clothing is generally appropriate. Large spills: total protection garment resistant to chemicals and made of antistatic material. Work gloves (preferably half-arm gloves) that provide adequate resistance to chemical agents. If there is a risk of contact with the liquefied product, 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 chemicals. Protection measures: Protective goggles and / or face protection devices if there is a risk of splashing or contact with the eyes. Respiratory protection: It is possible to use a half mask or a full mask equipped with filter(s) for organic vapours (AX), or a self-contained breathing apparatus, according to the extent of the leak and the predictable level of exposure. In the event that the situation cannot be fully assessed or if there is a risk of oxygen deficiency, use only a self-contained breathing apparatus.
 Emergency procedures: Notify the competent authorities in accordance with the regulations in force.

6.2 Environmental precautions

Stop the leak at the source if you can do so without risk. If this is not the case, use a pulverised water spray to keep the concentration of gas clouds under control and to help them escape into the atmosphere. Prevent the product from ending up in drains, rivers or other bodies of water. Avoid the dispersion of the gas in places where its accumulation could be dangerous (drains, depressions, etc.).

6.3 Methods and materials for containment and remediation

Methods for containment: Allow the product to evaporate, favouring its dispersion. Being heavier than air, vapours can spread at considerable distances at ground level, explode or catch fire, and return to the source. Inside buildings or confined spaces, ensure proper ventilation. If in water: The spillage of liquid product in the water will presumably result in a 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.
 Cleaning methods: None specified.
 Other information (accidental leak): The recommended measures are based on the most likely leakage scenarios for this product. Local conditions (wind, air or water temperature, direction and speed of waves and currents) can significantly influence the choice of action to be taken. Therefore, consult local experts if necessary.

6.4 Reference to other sections

For more information, see section 8: "Exposure control - individual protection".

GTS SPRAY - GTS MULTIAPP

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Precautions for safe handling: Risk of explosive mixture of vapours and air. Ensure that all provisions regarding the management and storage facilities of flammable products are correctly observed. 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 during receipt and transfer. Gas / vapours heavier than air. Pay particular attention to accumulation in wells and confined spaces. Keep away from heat / sparks / open flames / hot surfaces. No smoking. Use only bottom loading for tanks, in accordance with relevant European legislation. Do not use compressed air during filling, draining or handling operations. Use and store outside or in a well-ventilated area only. 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 perforate, cut, sand, weld, braise, burn or incinerate containers or empty drums that have not been cleaned.

Hygiene measures: Avoid contact with eyes and skin. Do not breathe in the vapours. Use appropriate personal protective equipment if necessary. Keep away from food and drink. Do not eat, drink or smoke during use.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a dry and well-ventilated place. No smoking. Keep away from open flames, hot surfaces and sources of ignition. The vapours are heavier than air, and can spread at ground level. Pay particular attention to accumulation in wells and confined spaces.

Incompatible products: Keep away from: strong oxidizers.

Storage temperature: <50°C

Storage place: The structure of the storage area, the characteristics of the tanks, the equipment and the operating procedures must comply with the relevant European, national or local legislations. The cleaning, inspection and maintenance activities of the internal structure of the storage tanks must be carried out by qualified and correctly equipped personnel, as established by national, local, or company regulations. For maintenance and storage activities, empty tanks must be cleaned 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 examination, check the atmosphere and check the oxygen content, as well as the degree of flammability.

Packaging and containers: Store only in the original container or in a container suitable for the type of product. Keep containers tightly closed and properly labelled. Cylinders must not be stored near other cylinders that contain compressed oxygen. Empty containers may contain combustible product residues. Do not weld, braze, puncture, cut or incinerate empty containers unless they have been properly cleaned / emptied.

Packaging materials: Use mild steel and stainless steel for containers and linings. Some synthetic materials may not be suitable for containers or linings based on the characteristics of the material and the intended uses. Check the compatibility with the manufacturer, according to the specific conditions of use.

7.3 Specific end uses

No information available.

SECTION 8: Exposure control / individual protection

8.1 Control parameters

Exposure limit values: ACGIH 2010: TLV® - TWA: 1,000 ppm (Alkanes, C1-C4)

Control methods (monitoring): The monitoring procedures must be selected on the basis of the indications established by the competent local authorities or by national labour contracts. Refer to Legislative Decree 81/2008 on best industrial hygiene practices.

8.2 Exposure control

Technical control measures: Reduce to a minimum any exposure. Before accessing storage tanks and starting any type of intervention in a confined space (e.g. tunnels), carry out adequate examination, check the atmosphere and check the oxygen content, as well as the degree of flammability.

Personal protective equipment (for industrial or professional use): Full mask (for the conditions of use, see: "Respiratory protection"). Protective visor. Safety goggles. Protective clothing. Gloves. Safety shoes.

GTS SPRAY - GTS MULTIAPP



Hand protection:	In case of possible contact with the skin, use gloves resistant to hydrocarbons, lined with brushed cotton. Presumably adequate materials: nitrile (NBR) or PVC with a protection index of at least 5 (permeation time ≥ 240 min). If there is a risk of contact with the liquefied product, the gloves must be thermally insulated in order to avoid cold burns. Use gloves in compliance with the conditions and limits set by the manufacturer. Replace gloves immediately if there are cuts, holes or show any other sign of deterioration. In this case, refer to the UNI EN 374 standard.
Eye protection:	In case of possible contact with the eyes, use safety goggles or other protection measures (face shield). In this case, refer to the UNI EN 166 standard.
Skin and body protection:	Work clothes with long sleeves. For the definition of the characteristics and performances according to the risks of the work area, refer to the UNI EN 340 standards and to the other applicable UNI-EN-ISO standards. Antistatic and non-slip safety shoes or boots, resistant to chemicals. Remove contaminated clothing and shoes.
Respiratory protection:	Regardless of other possible actions (adjustments of the installations, operating procedures and other means to reduce the exposure of workers), it is strongly advised to use individual protection adapted to the needs of the workforce. In ventilated or outdoor environments: in the event of product handling in the absence of suitable vapour containment systems, use masks or half-masks with a hydrocarbon vapour filter (AX). (EN 136/140/145). Combined filtering device (DIN EN 141). In confined spaces (e.g. inside tanks): the use of respiratory protection devices (half-masks, masks, respiratory devices) must be evaluated according to the work activity, the expected duration and the intensity of exposure. For the characteristics, refer to the 02/05/2001 Decree. If exposure levels cannot be determined or estimated with a good level of certainty or if an oxygen deficiency is likely to occur, use a self-contained breathing apparatus only. A large quantity of LPG (liquefied petroleum gas) vapours can lead to a lack of oxygen in the atmosphere. In this case, use a self-contained breathing apparatus only.
Thermal protection:	None under normal use conditions.
Atmosphere exposure control:	Do not dispose of the product in the environment.
Limitation and control of consumer exposure:	It must always be handled in a closed system. Ensure adequate ventilation.

8.3 Hygiene measures

General protective and hygiene rules of the worker:	Avoid contact with eyes and skin. Avoid breathing in vapours or mists. Wash with soap and water (if possible neutral soap); do not use irritant products or solvents that remove the sebaceous lining of the skin. Do not reuse contaminated clothing.
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SECTION 9: Physical and chemical properties

9.1 Essential physical and chemical properties

Molecular mass:	Not applicable.
Colour:	Colourless
Scent:	Odourless. Characteristic, it can be odourised for combustion or automotive use.
Odour threshold:	There is no data available on the preparation itself / on the compound itself.
pH:	Not applicable.
Fusion point:	-187°C - -138°C (depending on the composition)
Boiling point:	-42°C - -0.5°C (depending on the composition)
Flash point:	-104°C - -60°C (depending on the composition)
Evaporation rate in relation to butyl acetate:	Not applicable.
Flammability (solid, gas):	Not applicable.
Lower / higher flammability or explosive limits in air:	1.86% vol - 9.5% vol (depending on the composition)
Vapour pressure:	$\leq 1,550$ kPa [40°C]
Solubility:	Water: 24.4 - 60.4 mg/l (depending on the composition)
Ignition temperature:	287°C - 537°C (depending on the composition)
Kinematic viscosity:	Data not available.
Kinematic viscosity:	Not applicable.
Explosive properties:	None.

GTS SPRAY - GTS MULTIAPP

Oxidising properties: None.

9.2 Other information

VOC content: ≥90% (EU, CH, USA)
 Gas group: Press. Gas (Liq.)

The aforementioned data (9.1 - 9.2) are typical values and do not constitute specifications.

SECTION 10: Stability and reactivity

10.1 Reactivity

The mixture does not present further dangers linked to reactivity in relation to those reported in the subsequent subtitles.

10.2 Chemical stability

Stable product in relation to its intrinsic characteristics.

10.3 Possibility of dangerous reactions

No dangerous reactions are to be expected (in normal conditions of storage and handling). 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 oxidizers. Keep away from open flames, hot surfaces and sources of ignition. Avoid the accumulation of electrostatic charges.

10.5 Incompatible materials

Strong oxidizers.

10.6 Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Thermal decomposition can produce: Toxic vapours.

SECTION 11: Toxicological information

Acute toxicity: Not classified (conclusive data but not sufficient for classification) (depending on the composition).

Oral (LD₅₀): There is no data available.

Inhalation (LC₅₀): Rat.: 1443 mg/l (Propane) (15 min; Clark and Tiston 1982)

Inhalation (LC₅₀): Rat.: 800,000 ppm (Propane) (15 min; Clark and Tiston 1982)

Cutaneous (LD₅₀): There is no data available.

Skin corrosion / skin irritation: Not classified (conclusive data but not sufficient for classification).

Tests are not necessary, as the substance is a flammable gas (REACH Annex XI, #2).

Contact with the liquid can cause cold burns.

pH: Not applicable.

Serious eye damage / eye irritation: Not classified (conclusive data but not sufficient for classification) Tests are not necessary, as the substance is a flammable gas (REACH Annex XI, #2).

pH: Not applicable.

Respiratory or skin sensitization: Not classified (conclusive data but not sufficient for classification).

Tests are not necessary, as the substance is a flammable gas (REACH Annex XI, #2).

This product does not contain significant amounts of substances classified by the European Union as sensitizers (in any case, <0.1% p).

Germ cell mutagenicity: Not classified (conclusive data but not sufficient for classification).

(OECD 474).

(OECD 471 - Ames test).

This product contains <0.1% p of 1.3 butadiene (EINECS 203-450-8) (notes K - Annex VI Reg (EC) 1272/2008).

Not mutagenic.

Carcinogenicity: Not classified (conclusive data but not sufficient for classification) (depending on the composition).

This product contains <0.1% p of 1.3 butadiene (EINECS 203-450-8). According to EU criteria this product must be considered as non-carcinogenic.

Reproductive toxicity: Not classified (conclusive data but not sufficient for classification).

(EPA OPPTS 870.3465) (Huntingdon Life Sciences, 2009).

GTS SPRAY - GTS MULTIAPP

(EPA OPPTS 870.3650) (C5 - Huntingdon Life Sciences. 2010).
 Experimental tests provided negative results.

Specific target organ toxicity (STOT) - single exposure:	Not classified (conclusive data but not sufficient for classification) (depending on the composition).
Specific target organ toxicity (STOT) - repeated exposure:	Not classified (conclusive data but not sufficient for classification).
Danger in case of suction:	Tests are not necessary, as the substance is a flammable gas (REACH Annex XI, #2).
Possible harmful effects on humans and possible symptoms:	Not classified (conclusive data but not sufficient for classification. Technical impossibility of obtaining data). None predictable at room temperature. Contact with liquids, containers and distribution lines containing LPG (liquefied petroleum gas) should be avoided in order to prevent cold burns. The lack of oxygen due to exposure to high concentrations can cause asphyxia.
Other information:	None.

SECTION 12: Ecological information

12.1 Toxicity

Ecology - general:	Not harmful to aquatic organisms. The dispersion in the environment can however lead to the contamination of the environmental matrices (air). Use according to good working practices and avoid dispersing the product in the environment.
Ecology - air:	In case of dispersion in the environment, the constituents of the product evaporate in the atmosphere, where they undergo rapid degradation processes by the hydroxyl radicals. This phenomenon can contribute to the formation of photochemical smog, but depends on complex interactions with other pollutants, and on local atmospheric conditions.
Ecology - water:	Tests are not necessary, as the substance is a gas (REACH Annex VII-VIII, #2).

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 reg. REACH, Annex XIII (point 1.1).
Biodegradation:	100% (ethane) (16d, Read-across, QSAR).

12.3 Possibility of bio-accumulation

Log Pow:	1.09 - 2.8 (depending on the composition).
Possibility of bio-accumulation:	Low probability of bio-accumulation. The test methods for this endpoint are not applicable to UVCB substances.

12.4 Mobility in the soil

Mobility in the soil:	Not applicable due to the physical state of the product.
Ecology - soil:	The product is very volatile. The test methods for this endpoint are not applicable to UVCB substances.

12.5 Results of PBT and vPvB assessment

This substance / mixture does not meet the PBT criteria of REACH, annex XIII.	
This substance / mixture does not meet the vPvB criteria of REACH, annex XIII.	
PBT-vPvB assessment:	The components of this preparation do not meet the criteria for a classification as PBT or vPvB. From an environmental point of view, the product must be considered as "non-persistent", according to the criteria of the reg. REACH, Annex XIII (point 1.1).

12.6 Other adverse effects

ODP (Ozone Depletion Potential):	0 years. As a standard, trichlorofluoromethane (R-11) is used as a reference point, with an ODP value of 1.0.
GWP (Global Warming Potential):	3 years. It expresses the contribution to the greenhouse effect caused by a gaseous emission into the atmosphere. All molecules have a potential in relation to the CO ₂ molecule, which has a potential of 1 and acts as a reference point.

SECTION 13: Considerations for disposal

In the case of disposal, the substance as such, pursuant to Directive 2008/98/EC, must be classified as hazardous waste:
 - HP3 - "Flammable".

13.1 Waste treatment methods

Procedure for the method of waste treatment:	The product as such is not specifically regulated. Dispose of empty containers and waste safely.
Disposal recommendations:	Code(s) of the European Waste Characterisation (Decision 2001/118/EC): 16 05 04* (gases in pressure)

Safety Data Sheet

In compliance with Regulation (EU) No. 830/2015
 SDS Revision date: 03/10/2020
 Replaces the SDS: Rev. 06 of 13/11/2018

SDS edition: Revision 07

GTS SPRAY - GTS MULTIAPP

containers [including halons] containing dangerous substances). The EWC code provided is only a general indication, based on the original composition of the product and its intended use. It is up to the user to choose the most appropriate EWC code, based on the actual use of the product and any alterations or contaminations.

Additional information:

Empty containers may contain combustible product residues. Do not perforate, cut, sand, weld, braise, burn or incinerate containers or empty drums that have not been cleaned. Dispose of empty uncleaned containers safely, according to the Legislative Decree 152/2006 and subsequent amendments and additions. The product as such does not contain halogenated compounds.

Ecology - waste:

EURAL (EWC):

16 05 04* gases in pressure containers [including halons] containing hazardous substances.

SECTION 14: Transport information

According to the requirements of ADR / IMDG / IATA / ADN / RID

ADR	IMDG	IATA	ADN	RID
14.1 UN numbers				
1965	1965	1965	1965	1965
14.2 UN shipping name				
HYDROCARBON GAS MIXTURE, LIQUEFIED N.O.S such as: MIXTURE A, A01, A02, A0, A1, B1, B2, B and C. For the aforementioned mixtures, the following names, used in trade, are authorised for the designation of the subject: BUTANE for mixtures A, A01, A02 and A0, and PROPANE for mixture C.	HYDROCARBON GAS MIXTURE, LIQUEFIED N.O.S such as: MIXTURE A, A01, A02, A0, A1, B1, B2, B and C. For the aforementioned mixtures, the following names, used in trade, are authorised for the designation of the subject: BUTANE for mixtures A, A01, A02 and A0, and PROPANE for mixture C.	HYDROCARBON GAS MIXTURE, LIQUEFIED N.O.S such as: MIXTURE A, A01, A02, A0, A1, B1, B2, B and C. For the aforementioned mixtures, the following names, used in trade, are authorised for the designation of the subject: BUTANE for mixtures A, A01, A02 and A0, and PROPANE for mixture C.	HYDROCARBON GAS MIXTURE, LIQUEFIED N.O.S such as: MIXTURE A, A01, A02, A0, A1, B1, B2, B and C. For the aforementioned mixtures, the following names, used in trade, are authorised for the designation of the subject: BUTANE for mixtures A, A01, A02 and A0, and PROPANE for mixture C.	HYDROCARBON GAS MIXTURE, LIQUEFIED N.O.S such as: MIXTURE A, A01, A02, A0, A1, B1, B2, B and C. For the aforementioned mixtures, the following names, used in trade, are authorised for the designation of the subject: BUTANE for mixtures A, A01, A02 and A0, and PROPANE for mixture C.
14.3 Transport hazard class(es)				
2.1	2.1	2.1	2.1	2.1
14.4 Packaging group				
Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
14.5 Environmental hazards				
Dangerous for the environment: No	Dangerous for the environment: No Marine pollution: No	Dangerous for the environment: No	Dangerous for the environment: No	Dangerous for the environment: No

14.6 Special precautions for users

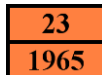
Special precautions for shipping:

The correct "Official name for shipping - Addition" must be chosen based on the characteristics of the product (vapour pressure at 70°C, density at 50°C), as per ADR 2.2.2.3, Section 2F, if necessary, in order to meet the requirements for the transport document (ADR 5.4.1.1), the following terms can be used as a technical name: - "Mixture A" or "BUTANE", - "Mixture A01" or "BUTANE", - "Mixture A02" or "BUTANE", - "Mixture A0" or "BUTANE", - "Mixture A1", - "Mixture B1", - "Mixture B2"; - "Mixture B", - "Mixture C" or "PROPANE". For transport in tanks, the commercial names "Butane" or "Propane" can only be used as a complement.

Ground transportation

ADR transport regulations:
 Classification code (UN):
 Transport category (ADR):
 Hazard No. (Kemler No.):
 Orange plate:

Subject to regulations.
 2F
 2
 23



Tunnel restriction code (ADR):

B/D

Sea transportation

IMDG transport regulations:

Subject to regulations.

Safety Data Sheet

In compliance with Regulation (EU) No. 830/2015
 SDS Revision date: 03/10/2020
 Replaces the SDS: Rev. 06 of 13/11/2018

SDS edition: Revision 07

GTS SPRAY - GTS MULTIAPP

Exempt quantities (IMDG): E0
 EmS-No. (Fire rating): F - E
 EmS-No. (Spill): S - U
 Stowage category (IMDG): E

Air transport

Regulated by ICAO transport: Prohibited on passenger aircrafts.
 Quantities exempt on passenger and cargo aircrafts (IATA): E0

Inland waterway transport

Transport regulations (ADN): Subject to regulations.
 Classification code (ADN): 2F
 Exempt quantities (ADN): E0

Railway transport

RID transport regulations: Subject to regulations.
 Classification code (RID): 2F
 Exempt quantities (RID): E0
 Transport category (RID): 2
 Hazard No. (RID): 23

14.7 Transport in bulk according to Annex II of Marpol 73/78 and the IBC code
 IBC code: None.

SECTION 15: Regulatory information

15.1 Legislative and regulatory provisions on health, safety and the environment specific to the substance or mixture
 The following restrictions apply pursuant to Annex XVII of Regulation (EC) No. 1907/2006 (REACH):

1.3-Butadiene: 28. Substances listed in Part 3 of Annex VI of Regulation (EC) No. 1272/2008 classified as carcinogenic category 1A or 1B (table 3.1) or carcinogenic category 1 or 2 (table 3.2) and reported as follows: carcinogenic category 1A (table 3.1) / category 1 carcinogens (table 3.2) listed in the Appendix 1, category 1B carcinogens (table 3.1) / category 2 carcinogens (table 3.2) listed in Appendix 2.

1.3-Butadiene: 29. Substances listed in Part 3 of Annex VI of Regulation (EC) No. 1272/2008 classified as mutagenic category 1A or 1B (table 3.1) or mutagenic category 1 or 2 (table 3.2) and reported as follows: mutagenic category 1A (table 3.1) / category 1 mutagens (table 3.2) listed in the Appendix 3, category 1B mutagens (table 3.1) / category 2 mutagens (table 3.2) listed in Appendix 4.

1.3-Butadiene: 40. Substances classified as flammable gases of category 1 or 2, flammable liquids of category 1, 2 or 3, flammable solids of category 1 or 2, substances and mixtures which, in contact with water, release flammable gases of category 1, 2 or 3, category 1 pyrophoric liquids or category 1 pyrophoric solids, even if not included in Part 3 of Annex VI, of Regulation (EC) No. 1272/2008.

No ingredients are in the REACH Candidate List (>0.1% m/m) and in the REACH list annex XIV.

Applicable European Union legislation: Regulation (EC) No. 1907/2006 of the European Parliament and of the Council, of 18 December 2006, related to the registration, evaluation, authorisation and restriction of chemical substances (REACH). (et sequens). Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 related to the classification, labelling and packaging of substances and mixtures, which amends and repeals Directives 67/548/EEC and 1999/45/EC, and amends regulation (EC) No. 1907/2006 (et sequens). Directives 89/391/EEC, 89/654/EEC, 89/655/EEC, 89/656/EEC, 90/269/EEC, 90/270/EEC, 90/394/EEC, 90/679/EEC, 93/88/EEC, 95/63/CE, 97/42/EC, 98/24/EC, 99/38/EC, 99/92/EC, 2001/45/EC, 2003/10/EC and 2003/18/EC (Improvement of the safety and health of workers in the workplace) Directive 92/85/EC (Measures to encourage the improvement of health and safety at work for pregnant workers, of workers who have recently given birth or are breastfeeding) Directive 98/24/EC (Protection of the health and safety of workers against the risks deriving from chemical agents during work). Directive 2012/18/EC (Control of major-accident hazards involving dangerous substances). The product, by composition or characteristics, falls within the criteria defined in Annex I. Refer to the Directive (or national laws) for details on the requirements relating to the volume of product stored on a specific site. Directive 2004/42/EC (limitation of

Safety Data Sheet

In compliance with Regulation (EU) No. 830/2015
 SDS Revision date: 03/10/2020
 Replaces the SDS: Rev. 06 of 13/11/2018

SDS edition: Revision 07

GTS SPRAY - GTS MULTIAPP

National standards: emissions of volatile organic compounds).
 Legislative Decree 81/2008, relating to the "Implementation of Article 1 of the Law of 3 August 2007, concerning the protection of health and safety in the workplace". Legislative Decree 105/2015 (adoption of Directive 2012/18/EC for the control of major-accident hazards involving dangerous substances). Legislative Decree 152/06: "Environmental regulations", and subsequent amendments and additions to Legislative Decree 151/2001 (Consolidated text of the legislative provisions on the protection and support of maternity and paternity).

SECTION 16: Other information

Indication of modifications: All sections have been updated. Section 2 updated in accordance to Regulation (UE) n.521/2019.

Abbreviations and acronyms:

	N/A = not available
	N/A = not applicable.
ADN	European agreement on the international transport of dangerous goods via inland waterways
ADR	The European Agreement Concerning the International Carriage of Dangerous Goods
ACGIH	American Conference of Governmental Industrial Hygienists
BCF	Bioconcentration factor
CLP calculator	Regulation concerning classification, labelling and packaging; Regulation (EC) No. 1272/2008
DMEL	Derived minimal effect level
DNEL	Derived no-effect level
EC50	Effective concentration for 50% of the tested population (median effective concentration)
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods Code
LC50	Lethal concentration for 50% of the tested population (median lethal concentration)
LD50	Lethal dose that determines the death of 50% of the tested population (median lethal dose)
LOAEL	Lowest-observed-adverse-effect level
NOAEC	No Observed Adverse Effect Concentration
NOEL	No Observed Adverse Effect Level
NOEC	No Observable Effect Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent, bio-accumulative and toxic
PNEC	Predicted No Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals, Regulation (EC) No. 1907/2006
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
STP	Sewage treatment plant
vPvB	very Persistent and very Bio-accumulating

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

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

Other information: Do not use the product for purposes other than those indicated by the manufacturer.
 Container under pressure: Protect against sunlight and do not expose to temperatures exceeding 50°C. Do not perforate or burn, even after use. Do not spray on a flame or an incandescent body.

List of poison control centres in Italy:

Ancona:	University hospital pharmacovigilance centre - from 7.30 a.m. to 1.30 p.m.	Via Tronto, 10 / A Torrette (Ancona) Phone: +0039 7218102
Bologna:	Ospedale Maggiore - 24/7	Via Largo Negrisoni 2 Phone: +0039 516478955
Catania:	Garibaldi Hospital - 24/7	Piazza Santa Maria di Gesù, 6 Phone +0039 957594120 - +0039 957594032
Cesena:	Maurizio Bufalini Hospital - 24/7	Viale Ghirotti Phone: +0039 547352612
Chieti:	Santissima Annunziata Hospital - 24/7	Via dei Vestini, 1 Phone: +0039 871551219

Safety Data Sheet

In compliance with Regulation (EU) No. 830/2015
 SDS Revision date: 03/10/2020
 Replaces the SDS: Rev. 06 of 13/11/2018

SDS edition: Revision 07

GTS SPRAY - GTS MULTIAPP

Florence:	Careggi Hospital - 24/7	Viale Pieraccini, 17 Phone +0039 557947819
La Spezia:	Sant'Andrea Civil Hospital - 24/7	Via Vittorio Veneto, 197 Phone +0039 187533297 - +0039 187533376
Lecce:	Presidium Hospital No.1 - 24/7	Vito Fazzi plant Piazza Muratore, 1 Phone +0039 832351105
Naples:	Cardarelli Hospital - 24/7	Via Cardarelli, 9 Phone: +0039 817472870
Pavia:	National Centre for Toxicological Information Salvatore Maugeri Foundation IRCCS Work and Rehabilitation Clinic - 24/7	Via Salvatore Maugeri, 10 Phone: +0039 38224444
Pordenone:	Civil Hospital -24/7	Via Montereale, 24 Phone: +0039 434550301
Reggio Calabria:	Reunited Hospital - 24/7	Via G. Melacrino, 1 Phone: +0039 965811624
Rome:	A. Gemelli Polyclinic - 24/7	Largo Agostino Gemelli, 8 Phone: +0039 63054343
Rome:	Umberto I Polyclinic - 24/7	Viale del Policlinico Phone: +0039 649978020
Turin:	Anaesthesia and resuscitation institute	Via Achille Mario Dogliotti Phone: +0039 116637637
Trieste:	Admission and Casualty Department, IRCCS Burlo Garofalo	Via dell'Istria 65/1 Phone: +0039 403785373