SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name **Propan (Propane)**

UFI: ☑GY1-J0Y8-K00E-FS8F

Other means of identification Propan (Propane), Liquefied petroleum gas in accordance with standard DIN 51622 or DIN 51629.

SDS # SGY2637

Product type Liquefied gas.

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

Use of the substance/ mixture Multi-purpose product with applications including gaseous fuel for domestic, commercial and industrial uses; internal combustion engine fuel; aerosol propellant; Chemical feedstock. For specific application advice see appropriate Technical Data Sheet or consult our company representative.

1.3 Details of the supplier of the safety data sheet

Supplier

Aral Aktiengesellschaft
Wittener Str. 45
44789 Bochum
Germany
Telefon: +49 (0) 234 315-0

E-mail address MSDSadvice@bp.com

1.4 Emergency telephone number

EMERGENCY TELEPHONE NUMBER +49 (0) 30 30686 790 (Giftnotruf Berlin/Emergency Poison Centre)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Flam. Gas 1A, H220
Press. Gas (Liq.), H280

See Section 16 for the full text of the H statements declared above.

See sections 11 and 12 for more detailed information on health effects and symptoms and environmental hazards.

2.2 Label elements

UFI: ☑GY1-J0Y8-K00E-FS8F

Hazard pictograms

Signal word Danger

Hazard statements

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

Precautionary statements

General

P102 - Keep out of reach of children.
P101 - If medical advice is needed, have product container or label at hand.

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

Response

P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - In case of leakage, eliminate all ignition sources.

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

Disposal Not applicable.

SECTION 2: Hazards identification

Hazardous ingredients Not applicable.

Supplemental label elements Not applicable.

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles Not applicable.

Special packaging requirements

Containers to be fitted with child-resistant fastenings Not applicable.

Tactile warning of danger Yes, applicable.

2.3 Other hazards

Results of PBT and vPvB assessment Product does not meet the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII.

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification This material is an asphyxiant. Asphyxiants may reduce the oxygen concentration in the air to dangerous levels. Symptoms of lack of oxygen include increased depth and frequency of breathing, air hunger, dizziness, headache, nausea or loss of consciousness.
Cold burns (frostbite) will result from skin/ eye contact with liquid.
Compressed gas can be very hazardous depending upon its pressure. It can cause serious eye damage by propelling dust and other solid particles into the eyes with great force. Compressed gas can be injected through the skin into the blood stream. A gas bubble in the blood stream can be fatal. The pressure of compressed gas and the noise created by its release may cause hearing damage. Seek immediate medical attention if injury has been caused by compressed gas.

Acts as a simple asphyxiant. At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Product definition Mixture

Contains <0.10% 1,3-butadiene.
Contains 95% (minimum) Propane, Propylene
Petroleum gas. A small quantity of stenching agent is commonly added to assist in leak detection.

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
Propane	REACH #: 01-2119486944-21 EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≥50	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[1]
Butane	REACH #: 01-2119474691-32 EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	<5	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[1]
Isobutane	REACH #: 01-2119485395-27 EC: 200-857-2 CAS: 75-28-5 Index: 601-004-00-0	<5	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[1]

See Section 16 for the full text of the H statements declared above.

Type

[1] Substance with a workplace exposure limit

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Do not use hot water. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention if irritation develops.

Skin contact
Do not use hot water. Drench contaminated clothing with water before removing. This is necessary to avoid the risk of sparks from static electricity that could ignite contaminated clothing. Contaminated clothing is a fire hazard. Contaminated leather, particularly footwear, must be discarded. Remove contaminated clothing and shoes. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse. Do not apply ointment or powders. DO NOT rub or compress the burnt area of skin. Get medical attention if symptoms occur. Cover wound with a sterile dressing. DO NOT attempt to remove portions of clothing glued to the skin, but cut round them.

Inhalation
If inhaled, remove to fresh air. Get medical attention if symptoms occur.

Ingestion
Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. As this product rapidly becomes a gas when released, refer to the inhalation section. Move exposed person to fresh air. Keep person warm and at rest. Get medical attention if symptoms occur.

Protection of first-aiders
No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 for more detailed information on health effects and symptoms.

Potential acute health effects

Inhalation
At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen. High vapour concentrations may produce symptoms of oxygen deficiency which, coupled with central nervous system depression, may lead to rapid loss of consciousness.

Ingestion
Ingestion of liquid can cause burns similar to frostbite.

Skin contact
Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Eye contact
Liquid can cause burns similar to frostbite. Liquid release or vapour pressure jets present a risk of serious damage to the eyes.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Inhalation
Solvent "sniffing" (abuse) or intentional overexposure to vapours can produce serious central nervous system effects, including unconsciousness, and possibly death. May be harmful by inhalation if exposure to vapour, mists or fumes resulting from thermal decomposition products occurs. Vapour, mist or fume may irritate the nose, mouth and respiratory tract.

Eye contact
Liquid release or vapour pressure jets present a risk of serious damage to the eyes. Vapour, mist or fume may cause eye irritation. Exposure to vapour, mist or fume may cause stinging, redness and watering of the eyes.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician
Treatment should in general be symptomatic and directed to relieving any effects. Treat cold burns as frostbite.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
If gas has ignited, do not attempt to extinguish it. In case of fire, use water fog, foam, dry chemical or carbon dioxide extinguisher or spray.

Unsuitable extinguishing media
Do not use water jet. The use of a water jet may cause the fire to spread by splashing the burning product.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture
Contains gas under pressure. Extremely flammable gas. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or explosion. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapour/gas is heavier than air and will spread along the ground. Runoff to sewer may create fire or explosion hazard.

Hazardous combustion products
Combustion products may include the following:
carbon oxides (CO, CO_2) (carbon monoxide, carbon dioxide)

SECTION 5: Firefighting measures

5.3 Advice for firefighters

Special precautions for fire-fighters

No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so. Every precaution must be taken to keep containers cool to avoid the possibility of a boiling liquid expanding vapour explosion (BLEVE). Pressurised containers are liable to explode violently when subjected to high temperatures.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Immediately contact emergency personnel. Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Eliminate all ignition sources. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Floors may be slippery; use care to avoid falling. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Put on appropriate personal protective equipment. Entry into a confined space or poorly ventilated area contaminated with vapour, mist or fume is extremely hazardous without the correct respiratory protective equipment and a safe system of work. Wear self-contained breathing apparatus.

For emergency responders

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. Do not enter a vapour cloud except for rescue; self-contained breathing apparatus must be worn. Liquid leaks generate large volumes of extremely flammable gas. A gas detector or instrument to detect explosive atmospheres (explosimeter) can be used to check for combustible gas or vapour in an atmosphere, but it needs care and training to be used safely. Use suitable protective equipment. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

Liquid leaks generate large volumes of flammable vapour, heavier than air, which may travel to remote sources of ignition (eg. along drainage systems). Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and material for containment and cleaning up

Small spill

Eliminate all ignition sources. Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres.

Large spill

Eliminate all ignition sources. Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. The method and equipment used must be in conformance with appropriate regulations and industry practice on explosive atmospheres. Where appropriate, use water spray to disperse the gas or vapour and to protect personnel attempting to stop leakage.

6.4 Reference to other sections

See Section 1 for emergency contact information.
See Section 5 for firefighting measures.
See Section 8 for information on appropriate personal protective equipment.
See Section 12 for environmental precautions.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

SECTION 7: Handling and storage

Protective measures

Put on appropriate personal protective equipment. Contains gas under pressure. Do not get in eyes or on skin or clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Keep away from heat and direct sunlight. Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use.

Germany - Storage code

2A

7.3 Specific end use(s)

Recommendations

See section 1.2 and Exposure scenarios in annex, if applicable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Propane	**TRGS 900 OEL (Germany).** PEAK: 7200 mg/m³ 15 minutes. Issued/Revised: 1/2006 PEAK: 4000 ppm 15 minutes. Issued/Revised: 1/2006 TWA: 1800 mg/m³ 8 hours. Issued/Revised: 1/2006 TWA: 1000 ppm 8 hours. Issued/Revised: 1/2006
Butane	**TRGS 900 OEL (Germany).** PEAK: 9600 mg/m³ 15 minutes. Issued/Revised: 1/2006 PEAK: 4000 ppm 15 minutes. Issued/Revised: 1/2006 TWA: 2400 mg/m³ 8 hours. Issued/Revised: 1/2006 TWA: 1000 ppm 8 hours. Issued/Revised: 1/2006
Isobutane	**TRGS 900 OEL (Germany).** PEAK: 9600 mg/m³ 15 minutes. Issued/Revised: 1/2006 PEAK: 4000 ppm 15 minutes. Issued/Revised: 1/2006 TWA: 2400 mg/m³ 8 hours. Issued/Revised: 1/2006 TWA: 1000 ppm 8 hours. Issued/Revised: 1/2006

Whilst specific OELs for certain components may be shown in this section, other components may be present in any mist, vapour or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.

Recommended monitoring procedures

Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Biological exposure indices

Product/ingredient name	Exposure indices

No exposure indices known.

Derived No Effect Level

No DNELs/DMELs available.

Predicted No Effect Concentration

No PNECs available

8.2 Exposure controls

SECTION 8: Exposure controls/personal protection

Appropriate engineering controls

Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.
All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.
Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organisation for standards.
The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.

Individual protection measures

Hygiene measures

Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.

Respiratory protection

If local exhaust ventilation or other methods of ventilation are not possible or are insufficient, wear suitable respiratory protective devices. Wear suitable respiratory protective devices if there is a risk of exposure limits being exceeded. The choice of suitable respiratory device will depend upon a risk assessment of the workplace environment and the task being carried out. If required, the respiratory device must be certified as safe in defined explosive atmospheres (EX Label). Respiratory protective devices must be checked to ensure they fit correctly each time they are worn. Please consult European standard EN 529 for further guidance on the selection, use, care and maintenance of respiratory protective devices.

Suitable breathing apparatus (independent of ambient atmosphere) must be worn if any of the following situations apply.
- When the workplace atmosphere is considered to be immediately dangerous to life and health.
- When there is a risk of the workplace atmosphere being oxygen deficient.
- When the workplace atmosphere is uncontrolled.
- When the workplace atmosphere is unknown.
- When there is a risk of loss of consciousness or asphyxiation
- When entry into a confined space is required.
- When there is a risk of gases being released that could be a fire or explosion hazard.
- When the concentration of contaminants in the atmosphere exceeds the level of protection (maximum allowed concentration) given by a filtering device
- When the contaminants have a low odour that would not be tasted or smelt by the wearer of a filtering device if the filter became exhausted or saturated.
- When there is a risk of hydrogen sulphide exposure limits being exceeded.

Ensure good ventilation.
Provided an air-filtering/air-purifying respirator is suitable, a filter for organic gases and vapours (boiling point <65°C) can be used. Use filter type AX or comparable standard.
If there is a requirement for the use of a respiratory protective device, but the use of breathing apparatus (independent of ambient atmosphere) is not required, then a suitable filtering device must be worn.
The filter class must be suitable for the maximum contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product.
Approved air-supplied breathing apparatus must be worn where there is a risk of oxygen deficiency (i.e. low oxygen concentration).

Eye/face protection

If there is a risk of liquid release or vapour pressure jets (e.g. during filling operations) wear a full face visor, chemical goggles and helmet to prevent cold burns / frostbite.

Skin protection

Hand protection

General Information:

Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. The correct choice of protective gloves depends upon the chemicals being handled, and the conditions of work and use. Most gloves provide protection for only a limited time before they must be discarded and replaced (even the best chemically resistant gloves will break down after repeated chemical exposures).

Gloves should be chosen in consultation with the supplier / manufacturer and taking account of a full assessment of the working conditions.

To prevent cold burns and frostbite wear cold resistant and impervious gauntlets/gloves.
Do not re-use gloves.
Protective gloves will deteriorate over time due to physical and chemical damage. Inspect and replace gloves on a regular basis.
Protective gloves must give suitable protection against mechanical risks (i.e. abrasion, blade cut and puncture).
The frequency of replacement will depend upon the circumstances of use.

SECTION 8: Exposure controls/personal protection

Breakthrough time:

Breakthrough time data are generated by glove manufacturers under laboratory test conditions and represent how long a glove can be expected to provide effective permeation resistance. It is important when following breakthrough time recommendations that actual workplace conditions are taken into account. Always consult with your glove supplier for up-to-date technical information on breakthrough times for the recommended glove type.
Our recommendations on the selection of gloves are as follows:

Continuous contact:

Gloves with a minimum breakthrough time of 240 minutes, or >480 minutes if suitable gloves can be obtained.
If suitable gloves are not available to offer that level of protection, gloves with shorter breakthrough times may be acceptable as long as appropriate glove maintenance and replacement regimes are determined and adhered to.

Short-term / splash protection:

Recommended breakthrough times as above.
It is recognised that for short-term, transient exposures, gloves with shorter breakthrough times may commonly be used. Therefore, appropriate maintenance and replacement regimes must be determined and rigorously followed.

Glove Thickness:

For general applications, we recommend gloves with a thickness typically greater than 0.35 mm.

It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.
Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task.

Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:

• Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.

• Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential.

Recommended: To prevent cold burns and frostbite wear cold resistant and impervious gauntlets/gloves. Nitrile gloves.

Skin and body

When handling cylinders wear protective footwear and suitable gloves.
Wear suitable protective clothing.
Footwear highly resistant to chemicals.
When there is a risk of ignition wear inherently fire resistant protective clothes and gloves.
Refer to standard: ISO 11612
When there is a risk of ignition from static electricity, wear anti-static protective clothing. For greatest effectiveness against static electricity, overalls, boots and gloves should all be anti-static.
Refer to standard: EN 1149
Cotton or polyester/cotton overalls will only provide protection against light superficial contamination.
When the risk of skin exposure is high (from experience this could apply to the following tasks: cleaning work, maintenance and service, filling and transfer, taking samples and cleaning up spillages) then a chemical protective suit and boots will be required.
Work clothing / overalls should be laundered on a regular basis. Laundering of contaminated work clothing should only be done by professional cleaners who have been told about the hazards of the contamination. Always keep contaminated work clothing away from uncontaminated work clothing and uncontaminated personal clothes.

Thermal hazards

If there is a risk of contact with the liquid, all protective equipment worn should be suitable for use with extremely low temperature materials.

SECTION 8: Exposure controls/personal protection

Refer to standards:

Respiratory protection: EN 529
Gloves: EN 420, EN 374
Eye protection: EN 166
Filtering half-mask: EN 149
Filtering half-mask with valve: EN 405
Half-mask: EN 140 plus filter
Full-face mask: EN 136 plus filter
Particulate filters: EN 143
Gas/combined filters: EN 14387

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Appearance

Physical state Liquefied gas.

Colour Colourless.

Odour Odourless. (Distinctive when stenched)

Odour threshold 0.001 ppm Based on Ethyl mercaptan

pH Not applicable. Based on Solubility in Water (insoluble in water.)

Melting point/freezing point -187.63°C (-305.7°F)

Initial boiling point and boiling range -42.1°C (-43.8°F) (Propane)
-0.5°C (31.1°F) (Butane)

Flash point Closed cup: <-50°C (<-58°F) [Pensky-Martens]

Evaporation rate Not applicable (gas).

Flammability (solid, gas) Extremely flammable gas.

Lower and upper explosion limit Lower: 1.7%
Upper: 10.9%

Vapour pressure 1712.1 kPa (12842 mm Hg) [50°C (122°F)]
<3100 kPa (<23252 mm Hg) [70°C (158°F)]

Relative vapour density 1.6 [Air = 1]

Relative density <1

Density 508 kg/m³ (0.508 g/cm³) at 15°C

Solubility(ies)

Media	Result
water	Not soluble

Miscible with water No.

Partition coefficient: n-octanol/water 1.09 (Based on Propane)

Auto-ignition temperature 450°C (842°F)

Decomposition temperature Not available.

Viscosity Not applicable. Based on physical state.

Explosive properties Not considered explosive based on structural and oxygen balance considerations.
Contains gas under pressure; may explode if heated. May form explosive mixtures with air.

Oxidising properties Not considered oxidizing based on structural considerations.

Remarks Density: >0.440 kg/l at 50°C

Particle characteristics

Median particle size Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity

No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.

10.2 Chemical stability

The product is stable.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous reactions will not occur.
Under normal conditions of storage and use, hazardous polymerisation will not occur.

10.4 Conditions to avoid

Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow gas to accumulate in low or confined areas. Avoid excessive heat.

10.5 Incompatible materials

Reactive or incompatible with the following materials: oxidising materials.

10.6 Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

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

Acute toxicity

Product/ingredient name	Result / Route	Test authority / Number	Species	Dose	Exposure	Remarks
Propane	LC50 Inhalation Gas.	not guideline -	Rat	>800000 ppm	15 minutes	-

Conclusion/Summary Not classified. Based on available data, the classification criteria are not met.

Acute toxicity estimates

Not available.

GERM CELL MUTAGENICITY

Product/ingredient name	Test authority / Test number	Cell	Type	Result	Remarks
Propane	OECD 471	-	Experiment: In vitro Subject: Non-mammalian species	Negative	-
	OECD 474	Cell: Somatic	Experiment: In vivo Subject: Unspecified	Negative	Based on LPG

Conclusion/Summary Not classified. Based on available data, the classification criteria are not met.

Reproductive toxicity

Product/ingredient name	Test authority / Test number	Species	Route	Exposure	Developmental	Maternal toxicity	Fertility	Remarks
Propane	OECD 414	Rat	Inhalation	14 days	Negative	-	-	no effects observed (Based on LPG)
	OECD 422	Rat	Inhalation	42 days	Negative	-	Negative	no effects observed
	OECD 413	Rat	Inhalation	90 days	-	-	Negative	no effects observed (Based on LPG)

Conclusion/Summary Development: Not classified. Based on available data, the classification criteria are not met.
Fertility: Not classified. Based on available data, the classification criteria are not met.
Effects on or via lactation: Not classified. Based on available data, the classification criteria are not met.

Specific target organ toxicity

SECTION 11: Toxicological information

Product/ ingredient name	Hazard	Test authority / Test number	Species	Route	Type	Dose	Exposure	Target organs	Remarks
Propane	STOT - RE	OECD 422	Rat	Inhalation	NOAEC	4000 ppm /6 hours	2 weeks	None.	-

Conclusion/Summary STOT - SE: Not classified. Based on available data, the classification criteria are not met.
STOT - RE: Not classified. Based on available data, the classification criteria are not met.

Information on likely routes of exposure Routes of entry anticipated: Dermal, Inhalation, Eyes.

Potential acute health effects

Inhalation At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen. High vapour concentrations may produce symptoms of oxygen deficiency which, coupled with central nervous system depression, may lead to rapid loss of consciousness.

Ingestion Ingestion of liquid can cause burns similar to frostbite.

Skin contact Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.

Eye contact Liquid can cause burns similar to frostbite. Liquid release or vapour pressure jets present a risk of serious damage to the eyes.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Ingestion Adverse symptoms may include the following:
frostbite

Skin contact Adverse symptoms may include the following:
frostbite

Eye contact Adverse symptoms may include the following:
frostbite

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Inhalation Solvent "sniffing" (abuse) or intentional overexposure to vapours can produce serious central nervous system effects, including unconsciousness, and possibly death. May be harmful by inhalation if exposure to vapour, mists or fumes resulting from thermal decomposition products occurs. Vapour, mist or fume may irritate the nose, mouth and respiratory tract.

Eye contact Liquid release or vapour pressure jets present a risk of serious damage to the eyes. Vapour, mist or fume may cause eye irritation. Exposure to vapour, mist or fume may cause stinging, redness and watering of the eyes.

Potential chronic health effects

General Solvent "sniffing" (abuse) or intentional overexposure to vapours can produce serious central nervous system effects, including unconsciousness, and possibly death.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Developmental effects No known significant effects or critical hazards.

Fertility effects No known significant effects or critical hazards.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

Remarks - Endocrine disruptor - Health Not available.

11.2.2 Other information

Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Test authority / Test number	Species	Type / Result	Exposure	Effects	Remarks
Propane	Modelled data -	Algae	Acute EC50 11.89 mg/l	96 hours	-	-
	Modelled data -	Daphnia	Acute LC50 27.14 mg/l	48 hours	-	-
	Modelled data -	Fish	Acute LC50 49.9 mg/l	96 hours	-	-

Environmental hazards Not classified as dangerous

12.2 Persistence and degradability

Oxidation will occur in the atmosphere via reaction with hydroxyl radicals, ozone and nitrate radicals.

Product/ingredient name	Test authority / Test number	Result - Exposure	Remarks
Propane	Modelled data	50 % - Readily - 3 days	-

12.3 Bioaccumulative potential

This product is not expected to bioaccumulate through food chains in the environment.

12.4 Mobility in soil

Soil/water partition coefficient (K_{OC}) Not available.

Mobility The product is volatile / gaseous. If released to water the product will rapidly evaporate into the atmosphere. If released to soil the product will rapidly evaporate into the atmosphere. Spillages are unlikely to penetrate the soil.

12.5 Results of PBT and vPvB assessment

Product does not meet the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII.

12.6 Endocrine disrupting properties Not available.

Remarks - Endocrine disruptor - Environment Not available.

Other ecological information Unlikely to cause long term effects in the aquatic environment.

12.7 Other adverse effects No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal Where possible, arrange for product to be recycled. Dispose of via an authorised person/ licensed waste disposal contractor in accordance with local regulations.

Hazardous waste Yes.

European waste catalogue (EWC)

Waste code	Waste designation
16 05 04*	gases in pressure containers (including halons) containing hazardous substances

However, deviation from the intended use and/or the presence of any potential contaminants may require an alternative waste disposal code to be assigned by the end user.

Packaging

Methods of disposal Empty pressure vessels should be returned to the supplier. Do not puncture or incinerate container.

Special precautions This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container. Empty packages may contain some remaining product. Hazard warning labels are a guide to the safe handling of empty packaging and should not be removed.

References Commission 2014/955/EU
Directive 2008/98/EC

SECTION 14: Transport information

	ADR/RID	ADN	IMDG	IATA
14.1 UN number or ID number	UN1965	UN1965	UN1965	UN1965
14.2 UN proper shipping name	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. (Mixture C)	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. (Mixture C)	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. (Propane)	HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S. (Propane)
14.3 Transport hazard class(es)	2 	2 	2.1 	2.1 
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
Additional information	**Hazard identification number** 23 **Tunnel code** B/D	**Remarks** Table: C. Danger: 2.1	**Emergency schedules** F-D, S-U	**Quantity limitation** Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: 150 kg. Limited Quantities - Passenger Aircraft: Forbidden.

14.6 Special precautions for user Not available.

ADR/RID Classification code: 2F

ADN Classification code: 2F

14.7 Maritime transport in bulk according to IMO instruments

Remarks

Liquified gas cargoes:
Ship type according to the IGC Code:: 2G, 2PG

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles Not applicable.

Other regulations

REACH Status The company, as identified in Section 1, sells this product in the EU in compliance with the current requirements of REACH.

United States inventory (TSCA 8b) All components are active or exempted.

Australia inventory (AIIC) All components are listed or exempted.

Canada inventory All components are listed or exempted.

China inventory (IECSC) All components are listed or exempted.

Japan inventory (CSCL) All components are listed or exempted.

Korea inventory (KECI) All components are listed or exempted.

SECTION 15: Regulatory information

Philippines inventory (PICCS) All components are listed or exempted.

Taiwan Chemical Substances Inventory (TCSI) All components are listed or exempted.

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Persistent Organic Pollutants

Not listed.

EU - Water framework directive - Priority substances

None of the components are listed.

Seveso Directive

This product is controlled under the Seveso Directive.

Named substances

Name
Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas

National regulations

Hazardous incident ordinance

Named substances

Name	Reference number
Liquefied flammable gases, Category 1 or 2 (including LPG) and natural gas	2.1

Hazard class for water nwg (classified according AwSV)

Prohibited Chemicals Regulation (ChemVerbotsV) When placed on the market in Germany, this product is not subject to the Prohibited Chemicals Regulation (ChemVerbotsV).

Occupational restrictions Observe employment restrictions in the following:
Gesetz zum Schutz der arbeitenden Jugend (Jugendarbeitsschutzgesetz – JArbSchG)
Gesetz zum Schutz von Müttern bei der Arbeit, in der Ausbildung und im Studium (Mutterschutzgesetz – MuSchG)

15.2 Chemical safety assessment A Chemical Safety Assessment has been carried out for one or more of the substances within this mixture. A Chemical Safety Assessment has not been carried out for the mixture itself.

SECTION 16: Other information

Abbreviations and acronyms

ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CAS = Chemical Abstracts Service
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
CSA = Chemical Safety Assessment
CSR = Chemical Safety Report
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EINECS = European Inventory of Existing Commercial chemical Substances
ES = Exposure Scenario
EUH statement = CLP-specific Hazard statement
EWC = European Waste Catalogue
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)

SECTION 16: Other information

OECD = Organisation for Economic Co-operation and Development
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006]
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail
RRN = REACH Registration Number
SADT = Self-Accelerating Decomposition Temperature
SVHC = Substances of Very High Concern
STOT-RE = Specific Target Organ Toxicity - Repeated Exposure
STOT-SE = Specific Target Organ Toxicity - Single Exposure
TWA = Time weighted average
UN = United Nations
UVCB = Complex hydrocarbon substance
VOC = Volatile Organic Compound
vPvB = Very Persistent and Very Bioaccumulative
Varies = may contain one or more of the following 64741-88-4 / RRN 01-2119488706-23, 64741-89-5 / RRN 01-2119487067-30, 64741-95-3 / RRN 01-2119487081-40, 64741-96-4/ RRN 01-2119483621-38, 64742-01-4 / RRN 01-2119488707-21, 64742-44-5 / RRN 01-2119985177-24, 64742-45-6, 64742-52-5 / RRN 01-2119467170-45, 64742-53-6 / RRN 01-2119480375-34, 64742-54-7 / RRN 01-2119484627-25, 64742-55-8 / RRN 01-2119487077-29, 64742-56-9 / RRN 01-2119480132-48, 64742-57-0 / RRN 01-2119489287-22, 64742-58-1, 64742-62-7 / RRN 01-2119480472-38, 64742-63-8, 64742-65-0 / RRN 01-2119471299-27, 64742-70-7 / RRN 01-2119487080-42, 72623-85-9 / RRN 01-2119555262-43, 72623-86-0 / RRN 01-2119474878-16, 72623-87-1 / RRN 01-2119474889-13

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Flam. Gas 1A, H220	Expert judgment
Press. Gas (Liq.), H280	Expert judgment

Full text of abbreviated H statements	H220	Extremely flammable gas.
	H280	Contains gas under pressure; may explode if heated.
Full text of classifications [CLP/GHS]	Flam. Gas 1A	FLAMMABLE GASES - Category 1A
	Press. Gas (Comp.)	GASES UNDER PRESSURE - Compressed gas

History

Date of issue/ Date of revision	17/11/2022.
Date of previous issue	23/03/2022.
Prepared by	Product Stewardship

Indicates information that has changed from previously issued version.

Notice to reader

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