

# SAFETY DATA SHEET

RGA Checkout Sample with Argon

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

### 1.1 Product identifier

**Product name** : RGA Checkout Sample with Argon  
**Part no.** : 5190-0519

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

**Identified uses** : Reagents and Standards for Analytical Chemistry Laboratory Use  
cylinder  
17 L (0.6 CF) @ 70 °F

**Uses advised against** : None known.

### 1.3 Details of the supplier of the safety data sheet

Agilent Technologies Deutschland GmbH  
Hewlett-Packard-Str. 8  
76337 Waldbronn  
Germany  
0800 603 1000

**e-mail address of person responsible for this SDS** : pdl-msds\_author@agilent.com

### 1.4 Emergency telephone number

**Emergency telephone number (with hours of operation)** : CHEMTREC®: +353 1 901 4670

## 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]

H220	FLAMMABLE GASES	Category 1A
H280	GASES UNDER PRESSURE	Compressed gas
H340	GERM CELL MUTAGENICITY	Category 1B
H350	CARCINOGENICITY	Category 1A
H360D	REPRODUCTIVE TOXICITY	Category 1A
H373	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE	Category 2

The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

**Ingredients of unknown toxicity** : Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 1 - 10%  
Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 1 - 10%  
Percentage of the mixture consisting of ingredient(s) of unknown acute oral toxicity: 1 - 10%

**Ingredients of unknown ecotoxicity** : Contains 8.5% of components with unknown hazards to the aquatic environment

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

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

### 2.2 Label elements

## SECTION 2: Hazards identification

Hazard pictograms :



Signal word : Danger

Hazard statements : H220 - Extremely flammable gas.  
 H280 - Contains gas under pressure; may explode if heated.  
 H340 - May cause genetic defects.  
 H350 - May cause cancer.  
 H360D - May damage the unborn child.  
 H373 - May cause damage to organs through prolonged or repeated exposure.

### Precautionary statements

Prevention : P201 - Obtain special instructions before use.  
 P280 - Wear protective gloves, protective clothing and eye or face protection.  
 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.

Storage : P403 - Store in a well-ventilated place.

Disposal : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : carbon monoxide and 1,3-butadiene

Supplemental label elements : Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Restricted to professional users.

### Special packaging requirements

Tactile warning of danger : Not applicable.

### 2.3 Other hazards

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 : 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 : Mixture

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
nitrogen	REACH #: Annex IV EC: 231-783-9 CAS: 7727-37-9	≥50 - ≤75	Press. Gas (Comp.), H280	-	[2]
hydrogen	REACH #: Annex V EC: 215-605-7 CAS: 1333-74-0 Index: 001-001-00-9	≥10 - ≤25	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]

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

methane	REACH #: Annex V EC: 200-812-7 CAS: 74-82-8 Index: 601-001-00-4	≤10	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
ethane	EC: 200-814-8 CAS: 74-84-0 Index: 601-002-00-X	≤5	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
carbon dioxide	REACH #: Annex IV EC: 204-696-9 CAS: 124-38-9	≤5	Press. Gas (Comp.), H280	-	[2]
ethylene	EC: 200-815-3 CAS: 74-85-1 Index: 601-010-00-3	≤3	Flam. Gas 1A, H220 Press. Gas (Liq.), H280 STOT SE 3, H336	-	[1] [2]
propane	EC: 200-827-9 CAS: 74-98-6 Index: 601-003-00-5	≤3	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
carbon monoxide	EC: 211-128-3 CAS: 630-08-0 Index: 006-001-00-2	≤3	Flam. Gas 1A, H220 Press. Gas (Comp.), H280 Acute Tox. 3, H331 Repr. 1A, H360D STOT RE 1, H372	ATE [Inhalation (gases)] = 1807 ppm	[1] [2]
acetylene	EC: 200-816-9 CAS: 74-86-2 Index: 601-015-00-0	≤3	Flam. Gas 1A, H220 Chem. Unst. Gas A, H230 Press. Gas (Comp.), H280	-	[2]
propene	EC: 204-062-1 CAS: 115-07-1 Index: 601-011-00-9	≤3	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
propyne	EC: 200-828-4 CAS: 74-99-7	≤3	Flam. Gas 1A, H220 Press. Gas (Comp.), H280 STOT SE 3, H335	-	[1] [2]
isobutane	EC: 200-857-2 CAS: 75-28-5 Index: 601-004-00-0	≤1	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
butane	EC: 203-448-7 CAS: 106-97-8	≤1	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
but-1-ene	EC: 203-449-2 CAS: 106-98-9 Index: 601-012-00-4	≤1	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
2-methylpropene	EC: 204-066-3 CAS: 115-11-7 Index: 601-012-00-4	≤1	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
(E)-but-2-ene	EC: 210-855-3 CAS: 624-64-6 Index: 601-012-00-4	≤1	Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
1,3-butadiene	EC: 203-450-8 CAS: 106-99-0	≤1	Flam. Gas 1A, H220 Press. Gas (Comp.),	-	[1] [2]

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

(Z)-but-2-ene	Index: 601-013-00-X EC: 209-673-7 CAS: 590-18-1 Index: 601-012-00-4	≤1	H280 Muta. 1B, H340 Carc. 1A, H350  Flam. Gas 1A, H220 Press. Gas (Comp.), H280	-	[2]
argon	REACH #: Annex IV EC: 231-147-0 CAS: 7440-37-1	≤0.3	Press. Gas (Comp.), H280  <b>See Section 16 for the full text of the H statements declared above.</b>	-	[2]

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

Type

[1] Substance classified with a health or environmental hazard

[2] 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** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : As this product is a gas, refer to the inhalation section.
- 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. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

**4.2 Most important symptoms and effects, both acute and delayed**

Over-exposure signs/symptoms

- Eye contact** : No specific data.
- Inhalation** : Adverse symptoms may include the following:  
reduced foetal weight  
increase in foetal deaths  
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:  
reduced foetal weight  
increase in foetal deaths  
skeletal malformations

## SECTION 4: First aid measures

**Ingestion** : Adverse symptoms may include the following:  
 reduced foetal weight  
 increase in foetal deaths  
 skeletal malformations

### 4.3 Indication of any immediate medical attention and special treatment needed

**Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

**Specific treatments** : No specific treatment.

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

### 5.2 Special hazards arising from the substance or mixture

**Hazards from the substance or mixture** : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

**Hazardous combustion products** : Decomposition products may include the following materials:  
 carbon dioxide  
 carbon monoxide  
 nitrogen oxides

### 5.3 Advice for firefighters

**Special precautions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. 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.

**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.

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

**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. See also the information in "For non-emergency personnel".

**6.2 Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. 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

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## SECTION 6: Accidental release measures

- Methods for cleaning up** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
- 6.4 Reference to other sections** : See Section 1 for emergency contact information.  
See Section 8 for information on appropriate personal protective equipment.  
See Section 13 for additional waste treatment information.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). 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. Do not puncture or incinerate container. Use only non-sparking tools. Avoid contact with eyes, skin and clothing. Empty containers retain product residue and can be hazardous. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not breathe gas. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Avoid exposure - obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid exposure during pregnancy.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. 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

- Storage** : Do not store above the following temperature: 51.667°C (125°F). 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). Store locked up. Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. See Section 10 for incompatible materials before handling or use.

### Seveso Directive - Reporting thresholds

#### Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
P2	10 tonnes	50 tonnes

### 7.3 Specific end use(s)

- Recommendations** : Industrial applications, Professional applications.
- Industrial sector specific solutions** : Not available.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

**SECTION 8: Exposure controls/personal protection**

Product/ingredient name	Exposure limit values
nitrogen	<b>NAOSH (Ireland, 4/2024)</b> Oxygen depletion [asphyxiant]. Notes: Advisory Occupational Exposure Limit Values (OELVs)
hydrogen	<b>NAOSH (Ireland, 4/2024)</b> Oxygen depletion [asphyxiant]. Notes: Advisory Occupational Exposure Limit Values (OELVs)
methane	<b>NAOSH (Ireland, 4/2024)</b> Oxygen depletion [asphyxiant]. Notes: Advisory Occupational Exposure Limit Values (OELVs)
ethane	<b>NAOSH (Ireland, 4/2024)</b> Oxygen depletion [asphyxiant]. Notes: Advisory Occupational Exposure Limit Values (OELVs)
carbon dioxide	<b>NAOSH (Ireland, 4/2024)</b> Notes: EU derived Occupational Exposure Limit Values OELV 8 hours: 5000 ppm. OELV 8 hours: 9000 mg/m <sup>3</sup> . OELV 15 minutes: 15000 ppm. OELV 15 minutes: 27000 mg/m <sup>3</sup> . <b>EU OEL (Europe, 1/2022)</b> TWA 8 hours: 5000 ppm. TWA 8 hours: 9000 mg/m <sup>3</sup> .
ethylene	<b>NAOSH (Ireland, 4/2024)</b> Oxygen depletion [asphyxiant]. Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV 8 hours: 200 ppm.
propane	<b>NAOSH (Ireland, 4/2024)</b> Oxygen depletion [asphyxiant]. Notes: Advisory Occupational Exposure Limit Values (OELVs)
carbon monoxide	<b>NAOSH (Ireland, 4/2024)</b> Repr 1A. Notes: EU derived Occupational Exposure Limit Values OELV 8 hours: 20 ppm. OELV 8 hours: 23 mg/m <sup>3</sup> . OELV 15 minutes: 100 ppm. OELV 15 minutes: 117 mg/m <sup>3</sup> . <b>EU OEL (Europe, 1/2022)</b> STEL 15 minutes: 100 ppm. STEL 15 minutes: 117 mg/m <sup>3</sup> . TWA 8 hours: 20 ppm. TWA 8 hours: 23 mg/m <sup>3</sup> .
acetylene	<b>NAOSH (Ireland, 4/2024)</b> Oxygen depletion [asphyxiant]. Notes: Advisory Occupational Exposure Limit Values (OELVs)
propene	<b>NAOSH (Ireland, 4/2024)</b> Oxygen depletion [asphyxiant]. Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV 8 hours: 500 ppm.
propyne	<b>NAOSH (Ireland, 4/2024)</b> Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV 8 hours: 1000 ppm. OELV 8 hours: 1610 mg/m <sup>3</sup> .
isobutane	<b>NAOSH (Ireland, 4/2024) [butane]</b> Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV 15 minutes: 1000 ppm.
butane	<b>NAOSH (Ireland, 4/2024) [butane]</b> Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV 15 minutes: 1000 ppm.
but-1-ene	<b>NAOSH (Ireland, 4/2024) [butenes]</b> Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV 8 hours: 250 ppm.
2-methylpropene	<b>NAOSH (Ireland, 4/2024) [butenes]</b> Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV 8 hours: 250 ppm.
(E)-but-2-ene	<b>NAOSH (Ireland, 4/2024) [butenes]</b> Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV 8 hours: 250 ppm.
1,3-butadiene	<b>NAOSH (Ireland, 4/2024)</b> Carc 1A, Muta 1B. Notes: EU derived Occupational Exposure Limit Values OELV 8 hours: 1 ppm.

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**SECTION 8: Exposure controls/personal protection**

(Z)-but-2-ene  argon	<p>OELV 8 hours: 2.2 mg/m<sup>3</sup>.  <b>EU OEL (Europe, 3/2024)</b>                  TWA 8 hours: 1 ppm.                  TWA 8 hours: 2.2 mg/m<sup>3</sup>.  <b>NAOSH (Ireland, 4/2024) [butenes]</b> Notes: Advisory Occupational Exposure Limit Values (OELVs)                  OELV 8 hours: 250 ppm.  <b>NAOSH (Ireland, 4/2024)</b> Oxygen depletion [asphyxiant]. Notes: Advisory Occupational Exposure Limit Values (OELVs)</p>
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**Biological exposure indices**

Product/ingredient name	Exposure indices
carbon monoxide	<p><b>NAOSH BGVs (Ireland, 1/2011)</b>                      BMGV: 3.5 % of haemoglobin, COHb [in blood]. Sampling time: end of shift - As soon as possible after exposure ceases.                      BMGV: 20 ppm, CO [in endexhaled air]. Sampling time: end of shift - As soon as possible after exposure ceases.</p>
1,3-butadiene	<p><b>NAOSH BGVs (Ireland, 1/2011)</b>                      BMGV: 2.5 pmol/g haemoglobin [Semi-quantitative, the biological analyte is an indicator of exposure to the substance but the quantitative interpretation of the measurement is ambiguous. These analytes should be used as a screening test if a quantitative test is not practical; or as a confirmatory test if the quantitative test is not specific and the origin of the determinant is in question.], mixture of N-1 and N-2-(hydroxybutenyl) valine haemoglobin adducts [in blood]. Sampling time: not critical.                      BMGV: 2.5 mg/l [Semi-quantitative, the biological analyte is an indicator of exposure to the substance but the quantitative interpretation of the measurement is ambiguous. These analytes should be used as a screening test if a quantitative test is not practical; or as a confirmatory test if the quantitative test is not specific and the origin of the determinant is in question.], 1,2 dihydroxy-4-(N-acetylcysteiny)-butane [in urine]. Sampling time: end of shift - As soon as possible after exposure ceases.</p>

**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.

**DNELs/DMELs**

Product/ingredient name	Result
carbon monoxide	DNEL - Workers - Short term - Inhalation 35 mg/m <sup>3</sup>
	DNEL - Workers - Long term - Inhalation 23 mg/m <sup>3</sup>
	DNEL - Workers - Long term - Inhalation 23 mg/m <sup>3</sup>
	DNEL - Workers - Short term - Inhalation 117 mg/m <sup>3</sup>
1,3-butadiene	DMEL - General population - Long term - Inhalation 0.2652 mg/m <sup>3</sup>
	DMEL - Workers - Long term - Inhalation 2.21 mg/m <sup>3</sup>

**PNECs**

Not available.

**8.2 Exposure controls**

**SECTION 8: Exposure controls/personal protection**

**Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**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. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

**Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

**Skin protection**

**Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

**Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves. Refer to European Standard EN 1149 for further information on material and design requirements and test methods.

**Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

**Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

**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** : Gas.  
**Colour** : Colourless.  
**Odour** : Not available.  
**Odour threshold** : Not available.  
**Melting point/freezing point** : Not applicable.  
**Boiling point or initial boiling point and boiling range** : Not available.

**SECTION 9: Physical and chemical properties**

<b>Flammability</b>	: Highly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
<b>Lower and upper explosion limit/flammability limit</b>	: Not available.
<b>Flash point</b>	: Not applicable.
<b>Auto-ignition temperature</b>	: Not available.
<b>Decomposition temperature</b>	: Not available.
<b>pH</b>	: Not applicable.
<b>Viscosity</b>	: Dynamic (room temperature): Not available. Kinematic (room temperature): Not available. Kinematic (40°C): Not available.
<b>Solubility</b>	: Not available.
<b>Partition coefficient: n-octanol/water</b>	: Not applicable.
<b>Vapour pressure</b>	: Not available.
<b>Relative density</b>	: 1
<b>Density</b>	: 1 g/cm <sup>3</sup> [21.1°C]
<b>Relative vapour density</b>	: Not available.
<b><u>Particle characteristics</u></b>	
<b>Median particle size</b>	: Not applicable.

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

<b>Explosive properties</b>	: Not available.
<b>Oxidising properties</b>	: Not available.

**9.2.2 Other safety characteristics**

<b>Evaporation rate</b>	: Not available.
<b>Physical/chemical properties comments</b>	: Not available.

**SECTION 10: Stability and reactivity**

<b>10.1 Reactivity</b>	: No specific test data related to reactivity available for this product or its ingredients.
<b>10.2 Chemical stability</b>	: The product is stable.
<b>10.3 Possibility of hazardous reactions</b>	: Hazardous reactions or instability may occur under certain conditions of storage or use.
<b>10.4 Conditions to avoid</b>	: 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.
<b>10.5 Incompatible materials</b>	: May react or be incompatible with oxidising materials.  Reactive or incompatible with the following materials: moisture. May react vigorously with water.
<b>10.6 Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	
ethylene	Rat - Male - Inhalation - LC50 Gas. Rat - Male - Inhalation - LC50 Gas.	>57000 ppm [4 hours] >65400 mg/m <sup>3</sup> [4 hours]
carbon monoxide	Rat - Inhalation - LC50 Gas. Rat - Inhalation - LC50 Gas.	1807 ppm [4 hours] 1900 mg/m <sup>3</sup> [4 hours]
1,3-butadiene	Rat - Oral - LD50 Rat - Inhalation - LC50 Gas. Rat - Inhalation - LC50 Vapour	5480 mg/kg 128000 ppm [4 hours] 285 g/m <sup>3</sup> [4 hours]
<b>Conclusion/Summary [Product]</b>	: Not available.	

#### Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
RGA Checkout Sample with Argon	N/A	N/A	120466.7	N/A	N/A
carbon monoxide	N/A	N/A	1807	N/A	N/A
1,3-butadiene	5480	N/A	128000	285	N/A

#### Skin corrosion/irritation

**Conclusion/Summary [Product]** : Not available.

#### Serious eye damage/eye irritation

**Conclusion/Summary [Product]** : Not available.

#### Respiratory corrosion/irritation

**Conclusion/Summary [Product]** : Not available.

#### Respiratory or skin sensitization

##### Skin

**Conclusion/Summary [Product]** : Not available.

##### Respiratory

**Conclusion/Summary [Product]** : Not available.

#### Germ cell mutagenicity

**Conclusion/Summary [Product]** : Not available.

#### Carcinogenicity

**Conclusion/Summary [Product]** : Not available.

#### Reproductive toxicity

**Conclusion/Summary [Product]** : Not available.

**SECTION 11: Toxicological information****Specific target organ toxicity (single exposure)**

<b>Product/ingredient name</b>	<b>Result</b>
ethylene	STOT SE 3, H336 (Narcotic effects)
propyne	STOT SE 3, H335 (Respiratory tract irritation)

**Specific target organ toxicity (repeated exposure)**

<b>Product/ingredient name</b>	<b>Result</b>
carbon monoxide	STOT RE 1, H372

**Aspiration hazard**

Not available.

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

**Potential acute health effects**

<b>Eye contact</b>	: Contact with rapidly expanding gas may cause burns or frostbite.
<b>Inhalation</b>	: No known significant effects or critical hazards.
<b>Skin contact</b>	: Contact with rapidly expanding gas may cause burns or frostbite.
<b>Ingestion</b>	: As this product is a gas, refer to the inhalation section.

**Symptoms related to the physical, chemical and toxicological characteristics**

<b>Eye contact</b>	: No specific data.
<b>Inhalation</b>	: Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
<b>Skin contact</b>	: Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
<b>Ingestion</b>	: Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations

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

<b>Potential immediate effects</b>	: Not available.
<b>Potential delayed effects</b>	: Not available.

**Long term exposure**

<b>Potential immediate effects</b>	: Not available.
<b>Potential delayed effects</b>	: Not available.

**Potential chronic health effects**

<b>Conclusion/Summary [Product]</b>	: Not available.
<b>General</b>	: May cause damage to organs through prolonged or repeated exposure.
<b>Carcinogenicity</b>	: May cause cancer. Risk of cancer depends on duration and level of exposure.
<b>Mutagenicity</b>	: May cause genetic defects.
<b>Reproductive toxicity</b>	: May damage the unborn child.

**11.2 Information on other hazards**

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## SECTION 11: Toxicological information

### 11.2.1 Endocrine disrupting properties

**Conclusion/Summary [Product]** : The product does not meet the criteria to be considered as having endocrine disrupting properties according to the criteria set out in either Regulation (EC) No. 1907/2006 or Regulation (EC) No 1272/2008.

## SECTION 12: Ecological information

### 12.1 Toxicity

**Conclusion/Summary [Product]** : Not available.

### 12.2 Persistence and degradability

Not available.

**Conclusion/Summary [Product]** : Not available.

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
carbon dioxide	0.83	-	Low
ethylene	1.13	-	Low
propyne	0.94	-	Low
1,3-butadiene	1.99	-	Low

### 12.4 Mobility in soil

#### Soil/water partition coefficient

Product/ingredient name	logK <sub>oc</sub>	K <sub>oc</sub>
carbon dioxide	1.1	11.5449
ethylene	0.51	3.22692
carbon monoxide	1.4	25.7127
propyne	0.51	3.25112
1,3-butadiene	1.2	16.1577

#### Results of PMT and vPvM assessment

Product/ingredient name	PMT	P	M	T	vPvM	vP	vM
carbon dioxide	No	No	No	No	No	No	No
ethylene	No	N/A	Yes	No	N/A	N/A	Yes
carbon monoxide	No	No	No	No	No	No	No
propyne	No	N/A	Yes	No	N/A	N/A	Yes
1,3-butadiene	No	No	No	No	No	No	No

**Mobility** : Not available.

**Conclusion/Summary** : The product does not meet the criteria to be considered as a PMT or vPvM.

### 12.5 Results of PBT and vPvB assessment

#### Regulation (EC) No. 1907/2006 [REACH]

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
carbon dioxide	No	No	No	No	No	No	No
ethylene	No	N/A	N/A	No	N/A	N/A	N/A
carbon monoxide	No	No	No	No	No	No	No
propyne	No	N/A	N/A	No	N/A	N/A	N/A
1,3-butadiene	N/A	N/A	N/A	Yes	N/A	N/A	N/A

#### Regulation (EC) No. 1272/2008 [CLP]

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## SECTION 12: Ecological information

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
carbon dioxide	No	No	No	No	No	No	No
ethylene	No	N/A	N/A	No	N/A	N/A	N/A
carbon monoxide	No	No	No	No	No	No	No
propyne	No	N/A	N/A	No	N/A	N/A	N/A
1,3-butadiene	No	No	No	No	No	No	No

**Conclusion/Summary Regulation (EC) No. 1272/2008 [CLP]** : The product does not meet the criteria to be considered as a PBT or vPvB.

### 12.6 Endocrine disrupting properties

**Conclusion/Summary [Product]** : The product does not meet the criteria to be considered as having endocrine disrupting properties according to the criteria set out in either Regulation (EC) No. 1907/2006 or Regulation (EC) No 1272/2008.

### 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** : Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. The generation of waste should be avoided or minimised wherever possible. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.




**Hazardous waste** : The classification of the product may meet the criteria for a hazardous waste.

#### Packaging

**Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

**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.

## SECTION 14: Transport information

	ADR/RID	IMDG	IATA
<b>14.1 UN number or ID number</b>	UN1954	UN1954	UN1954
<b>14.2 UN proper shipping name</b>	COMPRESSED GAS, FLAMMABLE, N.O.S. (Hydrogen, Methane)	COMPRESSED GAS, FLAMMABLE, N.O.S. (Hydrogen, Methane)	Compressed gas, flammable, n.o.s. (Hydrogen, Methane)
<b>14.3 Transport hazard class(es)</b>	2 	2.1 	2.1 
<b>14.4 Packing group</b>	-	-	-
<b>14.5 Environmental hazards</b>	No.	No.	No.

### Additional information

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## SECTION 14: Transport information

- ADR/RID** : **Hazard identification number** 23  
**Limited quantity** 0  
**Special provisions** 274, 662, 392  
**Tunnel code** (B/D)
- IMDG** : **Emergency schedules** F-D, S-U  
**Special provisions** 274, 392
- IATA** : **Quantity limitation** Passenger and Cargo Aircraft: Forbidden. Packaging instructions: Forbidden. Cargo Aircraft Only: 150 kg. Packaging instructions: 200. Limited Quantities - Passenger Aircraft: Forbidden. Packaging instructions: Forbidden.  
**Special provisions** A1, A807

**14.6 Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**14.7 Transport in bulk according to IMO instruments** : Not available.

## 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

###### Substances of very high concern

None of the components are listed.

##### Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

None of the components are listed / The components are not impacted by a restriction

**Labelling** : Restricted to professional users.

#### Other EU regulations

**Industrial emissions (integrated pollution prevention and control) - Air** : Listed

#### Ozone depleting substances (EU 2024/590)

Not listed.

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

Not listed.

#### Persistent Organic Pollutants

Not listed.

#### Seveso Directive

This product is controlled under the Seveso Directive.

#### Danger criteria

**Category**

P2

#### International regulations

##### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

## SECTION 15: Regulatory information

### Montreal Protocol

Not listed.

### Stockholm Convention on Persistent Organic Pollutants

Not listed.

### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### Inventory list

<b>Australia</b>	: Not determined.
<b>Canada</b>	: All components are listed or exempted.
<b>China</b>	: Not determined.
<b>Eurasian Economic Union</b>	: <b>Russian Federation inventory</b> : All components are listed or exempted.
<b>Japan</b>	: <b>Japan inventory (CSCL)</b> : Not determined. <b>Japan inventory (ISHL)</b> : All components are listed or exempted.
<b>New Zealand</b>	: Not determined.
<b>Philippines</b>	: Not determined.
<b>Republic of Korea</b>	: All components are listed or exempted.
<b>Taiwan</b>	: All components are listed or exempted.
<b>Thailand</b>	: All components are listed or exempted.
<b>Turkey</b>	: Not determined.
<b>United States</b>	: All components are active or exempted.
<b>Viet Nam</b>	: All components are listed or exempted.

**15.2 Chemical safety assessment** : This product contains substances for which Chemical Safety Assessments might still be required.

## SECTION 16: Other information

📌 Indicates information that has changed from previously issued version.

<b>Abbreviations and acronyms</b>	: 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 B = Bioaccumulative BCF = Bioconcentration Factor CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008] DMEL = Derived Minimal Effect Level DNEL = Derived No Effect Level EUH statement = CLP-specific Hazard statement IATA = International Air Transport Association IMDG = International Maritime Dangerous Goods IMO = International Maritime Organization M = Mobile N/A = Not available P = Persistent PBT = Persistent, Bioaccumulative and Toxic PMT = Persistent, Mobile and Toxic PNEC = Predicted No Effect Concentration RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail RRN = REACH Registration Number
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**SECTION 16: Other information**

SGG = Segregation Group  
 T = Toxic  
 vB = Very Bioaccumulative  
 vM = Very Mobile  
 vP = Very Persistent  
 vPvB = Very Persistent and Very Bioaccumulative  
 vPvM = Very Persistent and Very Mobile

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

Classification	Justification
Flam. Gas 1A, H220 Press. Gas (Comp.), H280 Muta. 1B, H340 Carc. 1A, H350 Repr. 1A, H360D STOT RE 2, H373	Calculation method On basis of test data Calculation method Calculation method Calculation method Calculation method

Full text of abbreviated H statements

H220	Extremely flammable gas.
H230	May react explosively even in the absence of air.
H280	Contains gas under pressure; may explode if heated.
H331	Toxic if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H340	May cause genetic defects.
H350	May cause cancer.
H360D	May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.

Full text of classifications [CLP/GHS]

Acute Tox. 3 Carc. 1A Chem. Unst. Gas A Flam. Gas 1A Muta. 1B Press. Gas (Comp.) Press. Gas (Liq.) Repr. 1A STOT RE 1  STOT RE 2  STOT SE 3	ACUTE TOXICITY - Category 3 CARCINOGENICITY - Category 1A CHEMICALLY UNSTABLE GASES - Category A FLAMMABLE GASES - Category 1A GERM CELL MUTAGENICITY - Category 1B GASES UNDER PRESSURE - Compressed gas GASES UNDER PRESSURE - Liquefied gas REPRODUCTIVE TOXICITY - Category 1A SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 1 SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3
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**Date of issue/ Date of revision** : 19/11/2025

**Date of previous issue** : 23/10/2025

**Version** : 2.1

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