

SAFETY DATA SHEET

Universal RGA Calibration Mix Cylinder Combo Box, Part Number 5184-3545

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

1.1 Product identifier

Product name	: Universal RGA Calibration Mix Cylinder Combo Box, Part Number 5184-3545		
Part no. (chemical kit)	: 5184-3545		
Part no.	: Praxair RGA Calibration Mix Cylinders	5184-3543	
	: Universal Gas Mix	5183-4800	

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

Identified uses	: Reagents and Standards for Analytical Chemistry Laboratory Use		
	<input checked="" type="checkbox"/> Praxair RGA Calibration Mix Cylinders		1 L
		Universal Gas Mix	1 L
Uses advised against	: None known.		

1.3 Details of the supplier of the safety data sheet

Agilent Technologies LDA UK Ltd.
 5500 Lakeside Cheadle Royal Business Park,
 Cheadle, Cheshire, SK8 3GR
 United Kingdom
 Tel: +44 (0) 345 712 5292
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®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition	: Praxair RGA Calibration Mix Cylinders	Mixture
	: Universal Gas Mix	Mixture

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

Praxair RGA Calibration Mix Cylinders

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

Universal Gas Mix

H220	FLAMMABLE GASES	Category 1A
H280	GASES UNDER PRESSURE	Compressed gas

Praxair RGA Calibration Mix Cylinders The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.



Universal Gas Mix The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

SECTION 2: Hazards identification

Ingredients of unknown toxicity	: Praxair RGA Calibration Mix Cylinders	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	: Praxair RGA Calibration Mix Cylinders	Contains 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

Hazard pictograms	: Praxair RGA Calibration Mix Cylinders	
	Universal Gas Mix	
Signal word	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Danger Danger
Hazard statements	: Praxair RGA Calibration Mix Cylinders	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.
	Universal Gas Mix	H220 - Extremely flammable gas. H280 - Contains gas under pressure; may explode if heated.
Precautionary statements		
Prevention	: Praxair RGA Calibration Mix Cylinders	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.
	Universal Gas Mix	P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Response	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381 - In case of leakage, eliminate all ignition sources.
Storage	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	P403 - Store in a well-ventilated place. P403 - Store in a well-ventilated place.
Disposal	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. Not applicable.
Hazardous ingredients	: Praxair RGA Calibration Mix Cylinders	carbon monoxide and 1,3-butadiene

SECTION 2: Hazards identification

Supplemental label elements	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Not applicable.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Restricted to professional users. Not applicable.
Special packaging requirements		
Containers to be fitted with child-resistant fastenings	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Not applicable.
Tactile warning of danger	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	This mixture does not contain any substances that are assessed to be a PBT or a vPvB. 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	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Acts as a simple asphyxiant. At very high concentrations, can displace the normal air and cause suffocation from lack of oxygen. 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

3.1 Substances	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Mixture Mixture
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Product/ingredient name	Identifiers	%	Classification	Type
Praxair RGA Calibration Mix Cylinders				
Carbon dioxide	UK (GB) REACH #: Annex IV 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 (Comp.), H280 STOT SE 3, H336	[1]
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	[1] [2]
Propyne	EC: 200-828-4 CAS: 74-99-7	≤3	Flam. Gas 1A, H220 Press. Gas (Comp.), H280 STOT SE 3, H335	[1]
1,3-butadiene	EC: 203-450-8 CAS: 106-99-0 Index: 601-013-00-X	≤1	Flam. Gas 1A, H220 Press. Gas (Comp.), H280 Muta. 1B, H340	[1] [2]

SECTION 3: Composition/information on ingredients

butane	EC: 203-448-7 CAS: 106-97-8 Index: 601-004-00-0	≤1	Carc. 1A, H350 Flam. Gas 1A, H220 Press. Gas (Comp.), H280	[2]
Universal Gas Mix carbon monoxide	EC: 211-128-3 CAS: 630-08-0 Index: 006-001-00-2	≤0.2	Flam. Gas 1A, H220 Press. Gas (Comp.), H280 Acute Tox. 3, H331 Repr. 1A, H360D STOT RE 1, H372 See Section 16 for the full text of the H statements declared above.	[1] [2]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type

- Praxair RGA Calibration Mix Cylinders [1] Substance classified with a health or environmental hazard
[2] Substance with a workplace exposure limit
- Universal Gas Mix [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** : Praxair RGA Calibration Mix Cylinders 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.
- Universal Gas Mix Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
- Inhalation** : Praxair RGA Calibration Mix Cylinders 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.
- Universal Gas Mix Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- Skin contact** : Praxair RGA Calibration Mix Cylinders 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.
- Universal Gas Mix 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. Get medical attention if symptoms occur.

SECTION 4: First aid measures

Ingestion	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	As this product is a gas, refer to the inhalation section.
Protection of first-aiders	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	As this product is a gas, refer to the inhalation section. 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. No action shall be taken involving any personal risk or without suitable training.

4.2 Most important symptoms and effects, both acute and delayed

Over-exposure signs/symptoms

Eye contact	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	No specific data. No specific data.
Inhalation	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations No specific data.
Skin contact	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations No specific data.
Ingestion	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	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. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	No specific treatment. No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	None known. None known.

5.2 Special hazards arising from the substance or mixture

SECTION 5: Firefighting measures

Hazards from the substance or mixture	: Praxair RGA Calibration Mix Cylinders	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.
	Universal Gas Mix	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	: Praxair RGA Calibration Mix Cylinders	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides
	Universal Gas Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide

5.3 Advice for firefighters

Special protective actions for fire-fighters	: Praxair RGA Calibration Mix Cylinders	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.
	Universal Gas Mix	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	: Praxair RGA Calibration Mix Cylinders	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Universal Gas Mix	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: Praxair RGA Calibration Mix Cylinders	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.
	Universal Gas Mix	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. Put on appropriate personal protective equipment.

SECTION 6: Accidental release measures

For emergency responders	: Praxair RGA Calibration Mix Cylinders	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".
	Universal Gas Mix	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	: Praxair RGA Calibration Mix Cylinders	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).
	Universal Gas Mix	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		
Methods for cleaning up	: Praxair RGA Calibration Mix Cylinders	Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
	Universal Gas Mix	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	: Praxair RGA Calibration Mix Cylinders	Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe 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.
	Universal Gas Mix	Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and 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.


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SECTION 7: Handling and storage

Advice on general occupational hygiene :  Praxair RGA Calibration Mix Cylinders 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.

Universal Gas Mix 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 :  Praxair RGA Calibration Mix Cylinders 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.

Universal Gas Mix 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). 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
 Praxair RGA Calibration Mix Cylinders P2	10 tonne	50 tonne
Universal Gas Mix P2	10 tonne	50 tonne

7.3 Specific end use(s)

Recommendations : Praxair RGA Calibration Mix Cylinders Industrial applications, Professional applications.
 Universal Gas Mix Industrial applications, Professional applications.

Industrial sector specific solutions :  Praxair RGA Calibration Mix Cylinders Not available.
 Universal Gas Mix 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
Praxair RGA Calibration Mix Cylinders Carbon dioxide carbon monoxide 1,3-butadiene butane Universal Gas Mix carbon monoxide	<p>EH40/2005 WELs (United Kingdom (UK), 1/2020). STEL: 27400 mg/m³ 15 minutes. STEL: 15000 ppm 15 minutes. TWA: 5000 ppm 8 hours. TWA: 9150 mg/m³ 8 hours.</p> <p>EH40/2005 WELs (United Kingdom (UK), 1/2020). TWA: 23 mg/m³ 8 hours. TWA: 20 ppm 8 hours. STEL: 100 ppm 15 minutes. STEL: 117 mg/m³ 15 minutes.</p> <p>EH40/2005 WELs (United Kingdom (UK), 1/2020). TWA: 1 ppm 8 hours. TWA: 2.2 mg/m³ 8 hours.</p> <p>EH40/2005 WELs (United Kingdom (UK), 1/2020). STEL: 1810 mg/m³ 15 minutes. STEL: 750 ppm 15 minutes. TWA: 1450 mg/m³ 8 hours. TWA: 600 ppm 8 hours.</p> <p>EH40/2005 WELs (United Kingdom (UK), 1/2020). TWA: 23 mg/m³ 8 hours. TWA: 20 ppm 8 hours. STEL: 100 ppm 15 minutes. STEL: 117 mg/m³ 15 minutes.</p>

Biological exposure indices

Product/ingredient name	Exposure indices
Praxair RGA Calibration Mix Cylinders carbon monoxide Universal Gas Mix carbon monoxide	<p>EH40/2005 BMGVs (United Kingdom (UK), 8/2018) BGV: 30 ppm, carbon monoxide [in end-tidal breath]. Sampling time: post shift.</p> <p>EH40/2005 BMGVs (United Kingdom (UK), 8/2018) BGV: 30 ppm, carbon monoxide [in end-tidal breath]. Sampling time: post shift.</p>

Recommended monitoring procedures : Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
Praxair RGA Calibration Mix Cylinders carbon monoxide	DNEL	Long term Inhalation	23 mg/m ³	Workers	Local
	DNEL	Long term Inhalation	23 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	35 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	117 mg/m ³	Workers	Local
1,3-butadiene	DMEL	Long term Inhalation	0.2652 mg/m ³	General population	Systemic
	DMEL	Long term Inhalation	2.21 mg/m ³	Workers	Systemic

SECTION 8: Exposure controls/personal protection

Universal Gas Mix carbon monoxide		Inhalation			
	DNEL	Long term Inhalation	23 mg/m ³	Workers	Local
	DNEL	Long term Inhalation	23 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	35 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	117 mg/m ³	Workers	Local

PNECs

No PNECs available

8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

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.

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.

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	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Gas. Gas.
Colour	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Colourless.
Odour	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Odourless.
Odour threshold	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Not available.
Melting point/freezing point	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Not applicable.
Initial boiling point and boiling range	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Not available.
Flammability	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. Flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.
Upper/lower flammability or explosive limits	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Lower: 5% Upper: 15.4%
Flash point	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Closed cup: -188°C
Auto-ignition temperature	:	Universal Gas Mix	540°C

Ingredient name	°C	Method
Praxair RGA Calibration Mix Cylinders		
Methane	287	-
Ethane	287	-

Decomposition temperature	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Not available.
pH	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Not applicable.
Viscosity	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Not applicable.
Solubility(ies)	:		Not available.
Partition coefficient: n-octanol/water	:	Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Not applicable.
Vapour pressure	:		Not available.

SECTION 9: Physical and chemical properties

Evaporation rate	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Not available.
Relative density	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Not applicable.
Vapour density	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Not available.
Explosive properties	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Not available.
Oxidising properties	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not available. Not available.
Particle characteristics		
Median particle size	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Not applicable. Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	The product is stable. The product is stable.
10.3 Possibility of hazardous reactions	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	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. 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.
10.5 Incompatible materials	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials.
10.6 Hazardous decomposition products	: Praxair RGA Calibration Mix Cylinders Universal Gas Mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced. 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	Species	Dose	Exposure
Praxair RGA Calibration Mix Cylinders carbon monoxide	LC50 Inhalation Gas.	Rat	1900 mg/m ³	4 hours
	LC50 Inhalation Gas.	Rat	1807 ppm	4 hours
	1,3-butadiene	Rat	128000 ppm	4 hours
	LC50 Inhalation Vapour	Rat	285 g/m ³	4 hours
	LD50 Oral	Rat	5480 mg/kg	-
butane	LC50 Inhalation Vapour	Rat	658000 mg/m ³	4 hours
Universal Gas Mix carbon monoxide	LC50 Inhalation Gas.	Rat	1900 mg/m ³	4 hours
	LC50 Inhalation Gas.	Rat	1807 ppm	4 hours

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)
Praxair RGA Calibration Mix Cylinders Praxair RGA Calibration Mix Cylinders carbon monoxide 1,3-butadiene butane	N/A	N/A	180700.0	N/A	N/A
	N/A	N/A	1807	N/A	N/A
	5480	N/A	128000	285	N/A
	N/A	N/A	N/A	658	N/A
Universal Gas Mix Universal Gas Mix carbon monoxide	N/A	N/A	1642727.3	N/A	N/A
	N/A	N/A	1807	N/A	N/A

Irritation/Corrosion

Conclusion/Summary : Not available.

Sensitiser

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Praxair RGA Calibration Mix Cylinders ethylene Propyne	Category 3	-	Narcotic effects Respiratory tract irritation
	Category 3	-	

Specific target organ toxicity (repeated exposure)

SECTION 11: Toxicological information

Product/ingredient name	Category	Route of exposure	Target organs
Praxair RGA Calibration Mix Cylinders carbon monoxide	Category 1	-	-
Universal Gas Mix carbon monoxide	Category 1	-	-

Aspiration hazard

Not available.

Information on likely routes of exposure : Praxair RGA Calibration Mix Cylinders Routes of entry anticipated: Inhalation.
Universal Gas Mix Routes of entry anticipated: Inhalation.

Potential acute health effects

Inhalation : Praxair RGA Calibration Mix Cylinders No known significant effects or critical hazards.
Universal Gas Mix No known significant effects or critical hazards.

Ingestion : Praxair RGA Calibration Mix Cylinders As this product is a gas, refer to the inhalation section.
Universal Gas Mix As this product is a gas, refer to the inhalation section.

Skin contact : Praxair RGA Calibration Mix Cylinders Contact with rapidly expanding gas may cause burns or frostbite.
Universal Gas Mix Contact with rapidly expanding gas may cause burns or frostbite.

Eye contact : Praxair RGA Calibration Mix Cylinders Contact with rapidly expanding gas may cause burns or frostbite.
Universal Gas Mix Contact with rapidly expanding gas may cause burns or frostbite.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : Praxair RGA Calibration Mix Cylinders Adverse symptoms may include the following:
reduced foetal weight
increase in foetal deaths
skeletal malformations
Universal Gas Mix No specific data.

Ingestion : Praxair RGA Calibration Mix Cylinders Adverse symptoms may include the following:
reduced foetal weight
increase in foetal deaths
skeletal malformations
Universal Gas Mix No specific data.

Skin contact : Praxair RGA Calibration Mix Cylinders Adverse symptoms may include the following:
reduced foetal weight
increase in foetal deaths
skeletal malformations
Universal Gas Mix No specific data.

Eye contact : Praxair RGA Calibration Mix Cylinders No specific data.
Universal Gas Mix No specific data.

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

SECTION 11: Toxicological information

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Conclusion/Summary : Not available.

General : Praxair RGA Calibration Mix Cylinders Universal Gas Mix May cause damage to organs through prolonged or repeated exposure.
No known significant effects or critical hazards.

Carcinogenicity : Praxair RGA Calibration Mix Cylinders Universal Gas Mix May cause cancer. Risk of cancer depends on duration and level of exposure.
No known significant effects or critical hazards.

Mutagenicity : Praxair RGA Calibration Mix Cylinders Universal Gas Mix May cause genetic defects.
No known significant effects or critical hazards.

Reproductive toxicity : Praxair RGA Calibration Mix Cylinders Universal Gas Mix May damage the unborn child.
No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Conclusion/Summary : Not available.

12.2 Persistence and degradability

Conclusion/Summary : Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
<input checked="" type="checkbox"/> Praxair RGA Calibration Mix Cylinders butane	-	-	Readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
<input checked="" type="checkbox"/> Praxair RGA Calibration Mix Cylinders			
Carbon dioxide	0.83	-	Low
ethylene	1.13	-	Low
Propyne	0.94	-	Low
1,3-butadiene	1.99	-	Low
butane	2.89	-	Low

12.4 Mobility in soil

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

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

12.6 Other adverse effects : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. 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. 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. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

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

Additional 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

UK (GB)/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.

Ozone depleting substances

Not listed.

Prior Informed Consent (PIC)

Not listed.

Persistent Organic Pollutants

Not listed.

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

Product / Ingredient name	Identifiers	Status
<input checked="" type="checkbox"/> Praxair RGA Calibration Mix Cylinders Praxair RGA Calibration Mix Cylinders	-	28 29 30
carbon monoxide	EC: 211-128-3 CAS: 630-08-0 Index: 006-001-00-2	30
1,3-butadiene	EC: 203-450-8 CAS: 106-99-0 Index: 601-013-00-X	28 29

Label : Praxair RGA Calibration Mix Cylinders Restricted to professional users.
Universal Gas Mix Not applicable.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
<input checked="" type="checkbox"/> Praxair RGA Calibration Mix Cylinders P2
Universal Gas Mix P2

National regulations

Product/ingredient name	List name	Name on list	Classification	Notes
<input checked="" type="checkbox"/> Praxair RGA Calibration Mix Cylinders 1,3-butadiene	UK Occupational Exposure Limits EH40 - WEL	buta-1,3-diene; 1,3-butadiene	Carc.	-
butane	UK Occupational Exposure Limits EH40 - WEL	butane	Carc.	-

EU regulations

SECTION 15: Regulatory information

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

Industrial emissions (integrated pollution prevention and control) - Water : Not listed

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

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

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

United States : All components are active or exempted.


SECTION 16: Other information

 Indicates information that has changed from previously issued version.

Abbreviations and acronyms :

- ATE = Acute Toxicity Estimate
- 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
- N/A = Not available
- PBT = Persistent, Bioaccumulative and Toxic
- PNEC = Predicted No Effect Concentration
- RRN = REACH Registration Number
- vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification

Classification	Justification
 Praxair RGA Calibration Mix Cylinders 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
Universal Gas Mix Flam. Gas 1A, H220 Press. Gas (Comp.), H280	On basis of test data On basis of test data

Full text of abbreviated H statements

SECTION 16: Other information

Praxair RGA

Calibration

Mix Cylinders

H220	Extremely flammable gas.
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.

Universal Gas

Mix

H220	Extremely flammable gas.
H280	Contains gas under pressure; may explode if heated.
H331	Toxic if inhaled.
H360D	May damage the unborn child.
H372	Causes damage to organs through prolonged or repeated exposure.

[Full text of classifications](#)

Praxair RGA

Calibration Mix

Cylinders

Acute Tox. 3	ACUTE TOXICITY - Category 3
Carc. 1A	CARCINOGENICITY - Category 1A
Flam. Gas 1A	FLAMMABLE GASES - Category 1A
Muta. 1B	GERM CELL MUTAGENICITY - Category 1B
Press. Gas (Comp.)	GASES UNDER PRESSURE - Compressed gas
Repr. 1A	REPRODUCTIVE TOXICITY - Category 1A
STOT RE 1	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 1
STOT RE 2	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
STOT SE 3	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3

Universal Gas Mix

Acute Tox. 3	ACUTE TOXICITY - Category 3
Flam. Gas 1A	FLAMMABLE GASES - Category 1A
Press. Gas (Comp.)	GASES UNDER PRESSURE - Compressed gas
Repr. 1A	REPRODUCTIVE TOXICITY - Category 1A
STOT RE 1	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 1

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