

HYDROGEN MIX - 10ppm CO; 10ppm CO₂; 500ppm CH₄1541073 - CO;CO₂; CH₄

2.1 : flammable gas.

Danger**SECTION 1. Identification of the substance/mixture and of the company/undertaking****Product identifier**

Trade name : HYDROGEN MIX - 10ppm CO; 10ppm CO₂; 500ppm CH₄
SDS Nr : 1541073 - CO;CO₂;CH₄

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

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use.
Test gas / Calibration gas. Laboratory use Contact supplier for more uses information

Details of the supplier of the safety data sheet

Company identification : AIR LIQUIDE (PTY) LTD
Crn Vereeniging Road & Andre Marais Street
Alrode, Alberton
Gauteng SOUTH AFRICA
Tel. : +27 87 288 1100

E-Mail address (competent person) : scr.sales@airliquide.com

Emergency telephone number

Emergency telephone number : +27 87 288 1100

SECTION 2. Hazards identification**Classification of the substance or mixture****Hazard Class and Category Code Regulation EC 1272/2008 (CLP)**

• Physical hazards : Flammable gases - Category 1 - Danger - (CLP : Flam. Gas 1) - H220
Gases under pressure - Compressed gas - Warning - (CLP : Press. Gas) - H280

Classification EC 67/548 or EC 1999/45

: F+; R12

Label elements**Labelling Regulation EC 1272/2008 (CLP)**

• Hazard pictograms



• Hazard pictograms code : GHS02 - GHS04

• Signal word : Danger

• Hazard statements : H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.



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SECTION 2. Hazards identification (continued)

• Precautionary statements

- Prevention : P210 - Keep away from heat, sparks, open flames or hot surfaces. – No smoking.
- Response : P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
- Storage : P403 - Store in a well-ventilated place.

Other hazards

: None.

SECTION 3. Composition/information on ingredients

Substance / 3.2. Mixture

Mixture.

Substance name	Contents	CAS No	EC No	Index No	Registration no	Classification
Carbon monoxide	: 0.001 %	630-08-0	211-128-3	006-001-00-2	01-2119480165-39	F+; R12 Repr. Cat. 1; R61 T; R23-48/23 ----- Flam. Gas 1 (H220) Repr. 1A (H360D) Acute Tox. 3 (H331) STOT RE 1 (H372) Press. Gas (H280)
Methane	: Between 0.045 and 0.055 %	74-82-8	200-812-7	601-001-00-4	* 1	F+; R12 ----- Flam. Gas 1 (H220) Press. Gas (H280)
Hydrogen	: >= 89.9532 %	1333-74-0	215-605-7	001-001-00-9	* 1	F+; R12 ----- Flam. Gas 1 (H220) Press. Gas (H280)

Contains no other components or impurities which will influence the classification of the product.

* 1: Listed in Annex IV / V REACH, exempted from registration.

* 2: Registration deadline not expired.

* 3: Registration not required: Substance manufactured or imported < 1t/y

Full text of R-phrases see chapter 16. Full text of H-statements see chapter 16

SECTION 4. First aid measures

Description of first aid measures

- Inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Skin contact : Adverse effects not expected from this product.
- Eye contact : Adverse effects not expected from this product.
- Ingestion : Ingestion is not considered a potential route of exposure.

Most important symptoms and effects, both acute and delayed

: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/ consciousness. Victim may not be aware of asphyxiation.
Refer to section 11.

Indication of any immediate medical attention and special treatment needed

: None.

HYDROGEN MIX - 10ppm CO; 10ppm CO₂; 500ppm CH₄**1541073 - CO;CO₂; CH₄****SECTION 5. Fire-fighting measures****Extinguishing media**

- Suitable extinguishing media : All known extinguishants can be used.

Special hazards arising from the substance or mixture

Specific hazards : Exposure to fire may cause containers to rupture/explode.

Hazardous combustion products : None.

Advice for fire-fighters

Specific methods : Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Coordinate fire measure to the surrounding fire. Cool endangered containers with water spray jet from a protected position. Do not empty contaminated fire water into drains. If possible, stop flow of product.

Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus.

SECTION 6. Accidental release measures**Personal precautions, protective equipment and emergency procedures**

: Evacuate area.
Try to stop release.
Ensure adequate air ventilation.
Eliminate ignition sources.
Consider the risk of potentially explosive atmospheres.

Environmental precautions

: Try to stop release.

Methods and material for containment and cleaning up

: Ventilate area.

Reference to other sections

: See also sections 8 and 13.

SECTION 7. Handling and storage**Precautions for safe handling**

Safe use of the product : Take precautionary measures against static discharge.
Purge air from system before introducing gas.
Keep away from ignition sources (including static discharges).
Do not smoke while handling product.
Assess the risk of potentially explosive atmosphere and the need for explosion-proof equipment.
Consider the use only non-sparking tools.
Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt.
Only experienced and properly instructed persons should handle gases under pressure.
The product must be handled in accordance with good industrial hygiene and safety procedures.
Ensure the complete gas system was (or is regularly) checked for leaks before use.

Safe handling of the gas receptacle : Refer to supplier's container handling instructions.
Do not allow backfeed into the container.
Protect cylinders from physical damage; do not drag, roll, slide or drop.
When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use.
If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
Never attempt to repair or modify container valves or safety relief devices.
Damaged valves should be reported immediately to the supplier.



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SECTION 7. Handling and storage (continued)

Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment.
Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another.
Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.

Conditions for safe storage, including any incompatibilities

- : Segregate from oxidant gases and other oxidants in store.
- All electrical equipment in the storage areas should be compatible with the risk of potentially explosive atmosphere.
- Keep away from combustible materials.
- Keep container below 50°C in a well ventilated place.
- Observe all regulations and local requirements regarding storage of containers.
- Containers should not be stored in conditions likely to encourage corrosion.
- Containers should be stored in the vertical position and properly secured to prevent toppling.
- Stored containers should be periodically checked for general condition and leakage.
- Container valve guards or caps should be in place.
- Store containers in location free from fire risk and away from sources of heat and ignition.

Specific end use(s)

- : None.

SECTION 8. Exposure controls/personal protection

Control parameters

Occupational Exposure Limits

Carbon monoxide

- : TLV[©] -TWA [ppm] : 25
- : ILV (EU) - 8 H - [ppm] : 20
- : ILV (EU) - 15 min - [mg/m³] : 117
- : ILV (EU) - 15 min - [ppm] : 100
- : ILV (EU) - 8 H - [mg/m³] : 23

DNEL: Derived no effect level

- : None available.

PNEC: Predicted no effect concentration

- : None available.

Exposure controls

Appropriate engineering controls

- : Systems under pressure should be regularly checked for leakages.
- Provide adequate general and local exhaust ventilation.
- Gas detectors should be used when flammable gases/vapours may be released.
- Ensure exposure is below occupational exposure limits (where available).
- Keep concentrations well below lower explosion limits.
- Consider work permit system e.g. for maintenance activities.

Individual protection measures, e.g. personal protective equipment

- : Consider the use of flame resistant anti-static safety clothing.
- A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.
- The following recommendations should be considered.
- Wear safety glasses with side shields
- Wear leather safety gloves and safety shoes when handling cylinders.

Environmental exposure controls

- : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

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- Physical state at 20°C / 101.3kPa : Gas.
- Colour : Colourless.
- Odour : Odourless.
- Odour threshold : Odour threshold is subjective and inadequate to warn for overexposure.
- pH value : Not applicable for gas-mixtures.
- Molar mass [g/mol] : Not applicable for gases and gas-mixtures.
- Melting point [°C] : Not applicable for gas-mixtures.
- Boiling point [°C] : Not applicable for gas-mixtures.
- Flash point [°C] : Not applicable for gas-mixtures.
- Evaporation rate (ether=1) : Not applicable for gas-mixtures.
- Flammability range [vol% in air] : Not applicable for gas-mixtures.
- Vapour pressure [20°C] : Not applicable.
- Relative density, gas (air=1) : Lighter or similar to air.
- Solubility in water [mg/l] : No reliable data available.
- Partition coefficient n-octanol/water : Not applicable for gas-mixtures.
- Viscosity at 20°C [mPa.s] : Not applicable.
- Explosive Properties : Not applicable.

Other information

- Other data : None.

SECTION 10. Stability and reactivity**Reactivity**

- : No reactivity hazard other than the effects described in sub-sections below.

Chemical stability

- : Stable under normal conditions.

Possibility of hazardous reactions

- : May react violently with oxidants.
Can form explosive mixture with air.

Conditions to avoid

- : Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

Incompatible materials

- : For additional information on compatibility refer to ISO 11114

Hazardous decomposition products

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

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Acute toxicity	: No known toxicological effects from this product.
Rat inhalation LC50 [ppm/4h]	: • Carbon monoxide : 1880
Skin corrosion/irritation	: No known effects from this product.
Serious eye damage/irritation	: No known effects from this product.
Respiratory or skin sensitisation	: No known effects from this product.
Carcinogenicity	: No known effects from this product.
Germ cell mutagenicity	: No known effects from this product.
Toxic for reproduction : Fertility	: No known effects from this product.
Toxic for reproduction : unborn child	: No known effects from this product.
STOT-single exposure	: No known effects from this product.
STOT-repeated exposure	: No known effects from this product.
Aspiration hazard	: Not applicable for gases and gas-mixtures.

SECTION 12. Ecological information**Toxicity**

: No data available.

Persistence - degradability

: No data available.

Bioaccumulative potential

: No data available.

Mobility in soil

: No data available.

Results of PBT and vPvB assessment

: No data available.

Other adverse effects

Effect on ozone layer	: None.
Effect on the global warming	: Contains greenhouse gas(es) not covered by 842/2006/EC

SECTION 13. Disposal considerations**Waste treatment methods**

: Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded.

Refer to the code of practice of EIGA (Doc. 30/10 "Disposal of Gases, downloadable at <http://www.eiga.org>) for more guidance on suitable disposal methods
Contact supplier if guidance is required.

Additional information

: None.

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UN number : 1954

Labelling ADR, IMDG, IATA



: 2.1 : flammable gas.

Land transport (ADR/RID)

H.I. nr : 23

UN proper shipping name : COMPRESSED GAS, FLAMMABLE, N.O.S. (Hydrogen, Methane)

Transport hazard class(es) : 2

Classification code : 1 F

Packing Instruction(s) : P200

Tunnel Restriction : B/D Tank carriage: Passage forbidden through tunnels of category B, C, D

Sea transport (IMDG)

Proper shipping name : COMPRESSED GAS, FLAMMABLE, N.O.S. (Hydrogen, Methane)

Class : 2.1

Packing group : P200

Emergency Schedule (EmS) - Fire : F-D

Emergency Schedule (EmS) - Spillage : S-U

Packing instruction : P200

Air transport (ICAO-TI / IATA-DGR)

Proper shipping name (IATA) : COMPRESSED GAS, FLAMMABLE, N.O.S. (Hydrogen, Methane)

Class : 2.1

Passenger and Cargo Aircraft : DO NOT LOAD IN PASSENGER AIRCRAFT.

Cargo Aircraft only : Allowed.

Packing instruction - Cargo Aircraft only : 200

Special precautions for user

- : Avoid transport on vehicles where the load space is not separated from the driver's compartment.
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.
Before transporting product containers :
- Ensure there is adequate ventilation.
 - Ensure that containers are firmly secured.
 - Ensure cylinder valve is closed and not leaking.
 - Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
 - Ensure valve protection device (where provided) is correctly fitted.

SECTION 15. Regulatory information**Safety, health and environmental regulations/legislation specific for the substance or mixture****EU legislation**

Seveso directive 96/82/EC : Covered

National legislation

: Ensure all national/local regulations are observed.

Chemical Safety Assessment

: A CSA does not need to be carried out for this product.



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HYDROGEN MIX - 10ppm CO; 10ppm CO₂; 500ppm CH₄**1541073 - CO;CO₂; CH₄****SECTION 15. Regulatory information (continued)****SECTION 16. Other information**

- Indication of changes** : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010
- Training advice** : Ensure operators understand the flammability hazard.
Receptacle under pressure.
- List of full text of R-phrases in section 3.** : R12 : Extremely flammable.
R23 : Toxic by inhalation.
R48/23 : Toxic : danger of serious damage to health by prolonged exposure through inhalation.
R61 : May cause harm to the unborn child.
- List of full text of H-statements in section 3.** : 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.
- Further information** : Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD.
This Safety Data Sheet has been established in accordance with the applicable European Union legislation.
- DISCLAIMER OF LIABILITY** : Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out.
Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.

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