

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 1: Identification

1.1. Identification

Product form : Mixture

Product name : Hydrogen (0.00001% - 2.00%), Nitrous Oxide (0.00001% - 1.00%), Tetrafluoromethane

(0.00001% - 1.00%), Carbon Dioxide (0.00001% - 2.9999%) in Nitrogen

Product code : SG-2005-03155

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

Use of the substance/mixture : Test gas/Calibration gas.

1.3. Details of the supplier of the safety data sheet

Air Liquide

9811 Katy Freeway, Suite 100 Houston, TX 77024 - USA T 1-800-819-1704 www.us.airliquide.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Compressed gas H280 - Contains gas under pressure; may explode if heated

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling

Signal word (GHS-US)

Hazard pictograms (GHS-US)



: Warning

Hazard statements (GHS-US) : H280 - Contains gas under pressure; may explode if heated

OSHA-H01 - May displace oxygen and cause rapid suffocation

Precautionary statements (GHS-US) : P202 - Do not handle until all safety precautions have been read and understood

P271 - Use only outdoors or in a well-ventilated area

P280 - Wear eye protection, face protection, protective gloves, protective clothing P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing

P308+P313 - If exposed or concerned: Get medical advice/attention

P403 - Store in a well-ventilated place

P501 - Dispose of contents/container in accordance with local/regional/national/international

regulations

CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

CGA-PG05 - Use a back flow preventive device in the piping CGA-PG06 - Close valve after each use and when empty CGA-PG10 - Use only with equipment rated for cylinder pressure CGA-PG14 - Approach suspected leak area with caution

CGA-PG21 - Open valve slowly

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

09/15/2015 EN (English US) Page 1

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 3: Composition/Information on ingredients

Substance

Not applicable

3.2. **Mixture**

Name	Product identifier	%	GHS-US classification
Nitrogen	(CAS No) 7727-37-9	93.0001 - 99.99996	Compressed gas, H280
Carbon dioxide	(CAS No) 124-38-9	0.00001 - 2.9999	Liquefied gas, H280
Hydrogen	(CAS No) 1333-74-0	0.00001 - 2	Flam. Gas 1, H220 Compressed gas, H280
Tetrafluoromethane (R14)	(CAS No) 75-73-0	0.00001 - 1	Liquefied gas, H280
Nitrous oxide	(CAS No) 10024-97-2	0.00001 - 1	Ox. Gas 1, H270 Liquefied gas, H280 STOT SE 3, H336

Full text of H-phrases: see section 16

SECTION 4: First aid measures

Description of first aid measures

First-aid measures after inhalation

: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel

unwell, seek medical advice.

First-aid measures after skin contact Adverse effects not expected from this product. First-aid measures after eve contact

Adverse effects not expected from this product.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

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

Symptoms/injuries after inhalation : May displace oxygen and cause rapid suffocation. Symptoms/injuries after skin contact : Adverse effects not expected from this product. : Adverse effects not expected from this product. Symptoms/injuries after eye contact

Symptoms/injuries after ingestion Ingestion is not considered a potential route of exposure.

Symptoms/injuries upon intravenous

administration

Not known

Chronic symptoms : Adverse effects not expected from this product.

Indication of any immediate medical attention and special treatment needed

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media : Do not use water iet to extinguish.

Special hazards arising from the substance or mixture

Fire hazard : The product is not flammable.

Explosion hazard Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire

and increasing risk of burns and injuries.

Reactivity : None known.

Advice for firefighters

Firefighting instructions : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray

or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.

Protection during firefighting Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire

fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

General measures : Ensure adequate ventilation.

09/15/2015 EN (English US) 2/10

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment consistent with the site emergency plan.

Emergency procedures : Escape the danger area by the closest safe route. Close doors and windows of adjacent

premises. Keep containers closed. Mark the danger area. Seal off low-lying areas. Keep

upwind.

6.1.2. For emergency responders

Protective equipment : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire

fighters. Equip cleanup crew with proper protection.

Emergency procedures : Evacuate and limit access. Ventilate area.

6.2. Environmental precautions

Try to stop release if safe to do so.

6.3. Methods and material for containment and cleaning up

For containment : Try to stop release if safe to do so.

Methods for cleaning up : Dispose of this material and its container in accordance with local regulations.

6.4. Reference to other sections

See also Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Pressurized container: Do not pierce or burn, even after use. Use equipment rated for cylinder

pressure. Close valve after each use and when empty.

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Use only outdoors or

in a well-ventilated area.

Hygiene measures : Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Comply with applicable regulations.

Storage conditions : Do not expose to temperatures exceeding 52°C (125°F). Keep container closed when not in

use. Protect cylinder from physical damage. Store in well ventilated area.

Incompatible products : None known. Incompatible materials : None known.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Carbon dioxide (124-38-9)		
ACGIH	ACGIH TWA (ppm)	5000 ppm
ACGIH	ACGIH STEL (ppm)	30000 ppm
OSHA	OSHA PEL (TWA) (mg/m³)	9000 mg/m³
OSHA	OSHA PEL (TWA) (ppm)	5000 ppm

Nitrous oxide (10024-97-2)		
ACGIH	ACGIH TWA (ppm)	50 ppm

8.2. Exposure controls

Appropriate engineering controls

: Ensure exposure is below occupational exposure limits. Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit

system e.g. for maintenance activities.

Hand protection : Wear working gloves when handling gas containers. 29 CFR 1910.138: Hand Protection. Eye protection : Wear safety glasses with side shields. 29 CFR 1910.133: Eye and Face Protection.

Skin and body protection : Wear suitable protective clothing, e.g. - lab coats, coveralls or flame resistant clothing.

09/15/2015 EN (English US) 3/10

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Respiratory protection : None necessary during normal and routine operations. See Sections 5 & 6.

Thermal hazard protection : None necessary during normal and routine operations.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for

specific methods for waste gas treatment.

Other information : Wear safety shoes while handling containers. 29 CFR 1910.136: Foot Protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Clear, colorless gas.

Color : Colorless

Odor : No data available
Odor threshold : No data available
pH : No data available
Melting point : No data available
Freezing point : No data available
Boiling point : No data available
No data available

Flash point : Not applicable - not flammable

Relative evaporation rate (butyl acetate=1) : No data available

Flammability (solid, gas) : See Section 2.1 and 2.2

Explosion limits : Not applicable - not flammable Explosive properties : Not applicable - not flammable.

Oxidizing properties : None.

Vapor pressure : No data available
Relative density : No data available
Relative vapor density at 20 °C : No data available

Molecular mass : Not applicable for gas-mixtures.

Relative gas density Similar to air Solubility No data available Log Pow No data available No data available Auto-ignition temperature Decomposition temperature No data available No data available Viscosity No data available Viscosity, kinematic Viscosity, dynamic : No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

None known.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

None known.

09/15/2015 EN (English US) 4/10

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

10.6. Hazardous decomposition products

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

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Tetrafluoromethane (R14) (75-73-0)			
LC50 inhalation rat (ppm)	820000 ppm/4h		
Carbon dioxide (124-38-9)			
LC50 inhalation rat (ppm)	820000 ppm/4h		
Nitrogen (7727-37-9)			
LC50 inhalation rat (ppm)	820000 ppm/4h		
Nitrous oxide (10024-97-2)			
LC50 inhalation rat (ppm)	250000 ppm/4h		
Hydrogen (1333-74-0)			
LC50 inhalation rat (ppm)	820000 ppm/4h		
ATE US (gases)	820000.000 ppmV/4h		
Skin corrosion/irritation	: Not classified		
Serious eye damage/irritation	: Not classified		
Respiratory or skin sensitization	: Not classified		
Germ cell mutagenicity	: Not classified		
Carcinogenicity	: Not classified		
Reproductive toxicity	: Not classified		
Specific target organ toxicity (single exposure)	: Not classified		

Specific target organ toxicity (repeated

exposure)

: Not classified

Aspiration hazard : Not classified

Symptoms/injuries after inhalation : May displace oxygen and cause rapid suffocation. Symptoms/injuries after skin contact : Adverse effects not expected from this product. Symptoms/injuries after eye contact : Adverse effects not expected from this product.

Symptoms/injuries after ingestion : Ingestion is not considered a potential route of exposure.

Symptoms/injuries upon intravenous : N

administration

: Not known.

Chronic symptoms : Adverse effects not expected from this product.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

Tetrafluoromethane (R14) (75-73-0)		
Persistence and degradability No data available.		
Carbon dioxide (124-38-9)		
Persistence and degradability	No ecological damage caused by this product.	

09/15/2015 EN (English US) 5/10

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Nitrogen (7727-37-9)		
Persistence and degradability No ecological damage caused by this product.		
Nitrous oxide (10024-97-2)		
Persistence and degradability Not applicable for inorganic gases.		
Hydrogen (1333-74-0)		
Persistence and degradability	No ecological damage caused by this product.	

12.3. Bioaccumulative potential

Tetrafluoromethane (R14) (75-73-0)				
Log Pow	1.18			
Bioaccumulative potential	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.			
Carbon dioxide (124-38-9)	Carbon dioxide (124-38-9)			
BCF fish 1	(no bioaccumulation)			
Log Pow	0.83			
Bioaccumulative potential	No ecological damage caused by this product.			
Nitrogen (7727-37-9)				
Log Pow	Not applicable for inorganic gases.			
Bioaccumulative potential	No ecological damage caused by this product.			
Nitrous oxide (10024-97-2)				
Log Pow	Not applicable for inorganic gases.			
Bioaccumulative potential	No data available.			
Hydrogen (1333-74-0)				
BCF fish 1	(no bioaccumulation expected)			
Log Pow	Not applicable for inorganic gases.			
Bioaccumulative potential	No ecological damage caused by this product.			

12.4. Mobility in soil

Tetrafluoromethane (R14) (75-73-0)			
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.		
Carbon dioxide (124-38-9)			
Ecology - soil	No ecological damage caused by this product.		
Nitrogen (7727-37-9)			
Ecology - soil	No ecological damage caused by this product.		
Nitrous oxide (10024-97-2)			
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.		
Hydrogen (1333-74-0)			
Ecology - soil	No ecological damage caused by this product.		

12.5. Other adverse effects

Effect on ozone layer : No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Contact supplier if guidance is required. 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.

Waste disposal recommendations : Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods.

09/15/2015 EN (English US) 6/10

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Transport document description : UN1956 Compressed gas, n.o.s., 2.2

UN-No.(DOT) : UN1956

Proper Shipping Name (DOT) : Compressed gas, n.o.s.

Transport hazard class(es) (DOT) : 2.2 - Class 2.2 - Non-flammable compressed gas 49 CFR 173.115

Hazard labels (DOT) : 2.2 - Non-flammable gas



DOT Packaging Non Bulk (49 CFR 173.xxx) : 302;305
DOT Packaging Bulk (49 CFR 173.xxx) : 314;315

DOT Symbols : G - Identifies PSN requiring a technical name

DOT Packaging Exceptions (49 CFR 173.xxx) : 306;307 DOT Quantity Limitations Passenger aircraft/rail : 75 kg

(49 CFR 173.27)

DOT Quantity Limitations Cargo aircraft only (49 : 150 kg

CFR 175.75)

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a

passenger vessel.

Other information : No supplementary information available.

TDG

Transport document description : UN1956 COMPRESSED GAS, N.O.S., 2.2

UN-No. (TDG) : UN1956

TDG Proper Shipping Name : COMPRESSED GAS, N.O.S.

TDG Primary Hazard Classes : 2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gas.

Transport by sea

UN-No. (IMDG) : 1956

Proper Shipping Name (IMDG) : COMPRESSED GAS, N.O.S.

Class (IMDG) : 2 - Gases

Air transport

UN-No. (IATA) : 1956

Proper Shipping Name (IATA) : COMPRESSED GAS, N.O.S.

Class (IATA) : 2

SECTION 15: Regulatory information

15.1. US Federal regulations

Tetrafluoromethane (R14) (75-73-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Carbon dioxide (124-38-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Nitrogen (7727-37-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Nitrous oxide (10024-97-2)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

09/15/2015 EN (English US) 7/10

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Hydrogen (1333-74-0)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

Tetrafluoromethane (R14) (75-73-0)			
Listed on the Canadian DSL (Domestic Sustances List)			
WHMIS Classification	Class A - Compressed Gas		
Carbon dioxide (124-38-9)			
Listed on the Canadian DSL (Domestic Sustance	ss List)		
WHMIS Classification	Class A - Compressed Gas		
Nitrogen (7727-37-9)	Nitrogen (7727-37-9)		
Listed on the Canadian DSL (Domestic Sustances List)			
WHMIS Classification	Class A - Compressed Gas		
Nitrous oxide (10024-97-2)			
Listed on the Canadian DSL (Domestic Sustances List)			
WHMIS Classification	Class A - Compressed Gas Class C - Oxidizing Material Class D Division 2 Subdivision A - Very toxic material causing other toxic effects		
Hydrogen (1333-74-0)			
Listed on the Canadian DSL (Domestic Sustances List)			
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas		

EU-Regulations

No additional information available

National regulations

Tetrafluoromethane (R14) (75-73-0)

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Carbon dioxide (124-38-9)

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Listed on the Canadian IDL (Ingredient Disclosure List)

Nitrogen (7727-37-9)

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Nitrous oxide (10024-97-2)

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Listed on the Canadian IDL (Ingredient Disclosure List)

09/15/2015 EN (English US) 8/10

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Hydrogen (1333-74-0)

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

15.3. US State regulations

Nitrous oxide (10024-97-2)				
U.S California - Proposition 65 - Carcinogens List	U.S California - Proposition 65 - Developmental Toxicity	U.S California - Proposition 65 - Reproductive Toxicity - Female	U.S California - Proposition 65 - Reproductive Toxicity - Male	Non-significant risk level (NSRL)
No	Yes	Yes	No	

Tetrafluoromethane (R14) (75-73-0)

U.S. - New Jersey - Right to Know Hazardous Substance List

Carbon dioxide (124-38-9)

- U.S. Massachusetts Right To Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) List

Nitrogen (7727-37-9)

- U.S. Massachusetts Right To Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) List

Nitrous oxide (10024-97-2)

- U.S. Massachusetts Right To Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) List

Hydrogen (1333-74-0)

- U.S. Massachusetts Right To Know List
- U.S. New Jersey Right to Know Hazardous Substance List
- U.S. Pennsylvania RTK (Right to Know) List

SECTION 16: Other information

Indication of changes : Revised safety data sheet in accordance with OSHA final rule on GHS implementation

promulgated March 26, 2012.

Other information : This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29

CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product.

Full text of H-phrases:

Compressed gas	Gases under pressure Compressed gas
Flam. Gas 1	Flammable gases Category 1
Liquefied gas	Gases under pressure Liquefied gas
Ox. Gas 1	Oxidizing gases Category 1
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H220	Extremely flammable gas
H270	May cause or intensify fire; oxidizer
H280	Contains gas under pressure; may explode if heated
H336	May cause drowsiness or dizziness

SDS US (GHS HazCom 2012)

09/15/2015 EN (English US) 9/10

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

This Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.

09/15/2015 EN (English US) 10/10