

**SAFETY DATA SHEET**Revised edition no : 2
Date : 12/05/2014**Carbon Monoxide**

PG 011

SECTION 1. IDENTIFICATION OF THE PRODUCT AND COMPANY UNDERTAKING

Material Name	CARBON MONOXIDE
Chemical Family	Inorganic, gas
Synonyms	MTG MSDS 18; CARBON OXIDE; CARBONIC OXIDE; CARBON OXIDE (CO); FLUE GAS; UN 1016; CO; RTECS: FG3500000
Product Use	Industrial
Usage Restrictions	None known.
Company	Puregas (Pty) Ltd PO Box 123884, Alrode, 1451, South Africa Tel : (011) 903 9760 Fax: (011) 903 9766 Cellphone: 082 889 6946 (1 st) 082 885 7475 (2 nd) Info@puregas.co.za Emergency Tel: 0800 172 743 (Rapid Spill Response)

SECTION 2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW	Color: colorless Physical Form: gas Odor: odorless Health Hazards: harmful if inhaled, blood damage, difficulty breathing Physical Hazards: Flammable gas. May cause flash fire.
POTENTIAL HEALTH EFFECTS	
Inhalation	Short Term: nausea, vomiting, chest pain, wheezing, headache, drowsiness, dizziness, loss of coordination, bluish skin colour, suffocation, lung congestion, coma. Long Term: no information on significant adverse effects
Skin	Short Term: blisters, frostbite Long Term: no information is available
Eye	Short Term: frostbite, blurred vision Long Term: no information is available
Ingestion	Short Term: ingestion of a gas is unlikely Long Term: ingestion of a gas is unlikely

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS	Component	Percent
630-08-0	CARBON MONOXIDE	100



SAFETY DATA SHEET

Revised edition no : 2
Date : 12/05/2014

Carbon Monoxide

PG 011

SECTION 4. FIRST AID MEASURES

Inhalation	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.
Skin	If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.
Eyes	Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention
Ingestion	If a large amount is swallowed, get medical attention.
Note to Physicians	For inhalation, consider oxygen.

SECTION 5. FIRE-FIGHTING MEASURES

See Section 9 for Flammability Properties	
NFPA Ratings: Health: 1 Fire: 4 Reactivity: 3	Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
Flammable Properties	Severe fire hazard. Vapor/air mixtures are explosive. Containers may rupture or explode if exposed to heat.
Extinguishing Media	Carbon dioxide, regular dry chemical Large fires: Use regular foam or flood with fine water spray.
Unsuitable Extinguishing Media	None known.
Protective Equipment and Precautions for Firefighters	Wear full protective firefighting gear including self-contained breathing apparatus (SCBA) for protection against possible exposure.
Fire Fighting Measures	Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Cool containers with water. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Water Release	Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.
Occupational spill/release	Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Keep unnecessary people away, isolate hazard area and deny entry. Remove sources of ignition.



SAFETY DATA SHEET

Revised edition no : 2
Date : 12/05/2014

Carbon Monoxide

PG 011

SECTION 7. HANDLING AND STORAGE

Handling procedure

Wash thoroughly after handling.

Storage Procedures

Store in accordance with all current regulations and standards. Store in a cool, dry place. Store in a well-ventilated area. Avoid direct sunlight. Avoid heat, flames, sparks and other sources of ignition. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Analysis

CARBON MONOXIDE (630-08-0)

ACGIH: 25 ppm TWA

OSHA (final): 50 ppm TWA; 55 mg/m3 TWA

OSHA (vacated): 35 ppm TWA; 40 mg/m3 TWA

200 ppm Ceiling; 229 mg/m3 Ceiling

NIOSH: 35 ppm TWA; 40 mg/m3 TWA

200 ppm Ceiling; 229 mg/m3 Ceiling

Component Biological Limit Values

CARBON MONOXIDE (630-08-0)

ACGIH: 3.5 % of hemoglobin Medium: blood Time: end of shift Parameter:

Carboxyhemoglobin (background, nonspecific); 20 ppm Medium: end-exhaled air Time: end of shift Parameter: Carbon monoxide (background, nonspecific)

IDLH

1200 ppm

Ventilation

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

**PERSONAL PROTECTIVE EQUIPMENT
Eyes/Face**

For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Protective Clothing

For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

Glove Recommendations

Wear insulated gloves.

Respiratory Protection

The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

350 ppm

Any supplied-air respirator.

875 ppm

Any supplied-air respirator operated in a continuous-flow mode.

1200 ppm

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.

End of service life indicator required (ESLI).

Any self-contained breathing apparatus with a full facepiece.



SAFETY DATA SHEET

Revised edition no : 2
Date : 12/05/2014

Carbon Monoxide

PG 011

	<p>Any supplied-air respirator with a full facepiece. Emergency or planned entry into unknown concentrations or IDLH conditions - Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Escape - Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern. End of service life indicator required (ESLI). Any appropriate escape-type, self-contained breathing apparatus.</p>
--	---

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Safety Data Sheet

Physical State:	Gas	Appearance	Not available
Color:	Colorless	Physical Form	gas
Odor:	Odorless	Odor Threshold	Not available
Taste	Tasteless	pH	Not available
Melting/Freezing Point	-205 °C	Boiling Point	-191.5 °C
Decomposition	Not available	Evaporation Rate	Not available
LEL	>=12.5 % by volume	UEL	74 % by volume
Vapor Pressure	760 mmHg @ -191 °C	Vapor Density (air = 1)	0.968
Density	1.250 g/L @ 0 °C	Water Solubility	2.3 % @ 20 °C
Log KOW	Not available	Auto Ignition:	700 °C
Molecular Formula	C-O	Molecular Weight	28.01
Solvent Solubility	Soluble: alcohol, benzene, acetic acid, ethyl acetate, chloroform, cuprous chloride solutions		

SECTION 10. STABILITY AND REACTIVITY

Chemical Stability	Stable at normal temperatures and pressure.
Conditions to Avoid	Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.
Materials to Avoid	oxidizing materials, halogens, metal oxides, metals, combustible materials, lithium
Decomposition Products	oxides of carbon
Possibility of Hazardous Reactions	Will not polymerize.



SAFETY DATA SHEET

Revised edition no : 2
Date : 12/05/2014

Carbon Monoxide

PG 011

SECTION 11. TOXICOLOGICAL INFORMATION

Component Analysis - LD50/LC50	The components of this material have been reviewed in various sources and the following selected endpoints are published: CARBON MONOXIDE (630-08-0) Inhalation LC50 Rat 1807 ppm 4 h
Acute Toxicity Level	CARBON MONOXIDE (630-08-0) Toxic: inhalation
Component Carcinogenicity	None of this product's components are listed by ACGIH, IARC, NTP, OSHA or DFG.
Irritation	No animal testing data available for skin or eyes.
Target Organs	CARBON MONOXIDE (630-08-0) Blood
Medical Conditions Aggravated by Exposure	blood system disorders, heart or cardiovascular disorders, hormonal disorders, respiratory disorders
Mutagenic	Limited mutagenic data available, however carbon monoxide is generally not considered to be mutagenic.
Reproductive Effects	Available data characterizes this substance as a reproductive hazard.
Additional Data	Alcohol may enhance the toxic effects. May cross the placenta. Smoking may enhance the toxic effects.

SECTION 12. ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity	No LOEL ecotoxicity data are available for this product's components.
--	---

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Component Waste Numbers	The U.S. EPA has not published waste numbers for this product's components.

SECTION 14. TRANSPORT INFORMATION

US DOT Information	Shipping Name: Carbon monoxide, compressed UN/NA #: UN1016 Hazard Class: 2.3 Required Label(s): 2.3, 2.1 Additional Info.: Toxic-Inhalation Hazard Zone D
TDG Information	Shipping Name: Carbon monoxide, compressed UN #: UN1016 Hazard Class: 2.3 Required Label(s): 2.3, (2.1)

SECTION 15. REGULATORY INFORMATION

U.S. Federal Regulations	None of this products components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.
---------------------------------	---



SAFETY DATA SHEET

Revised edition no : 2
Date : 12/05/2014

Carbon Monoxide

PG 011

SARA 311/312

Acute Health: Yes Chronic Health: Yes Fire: Yes Pressure: Yes Reactive: No

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists

Component	CAS	CA	MA	MN	NJ	PA
CARBON MONOXIDE	630-08-0	Yes	Yes	Yes	Yes	Yes

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Canada WHMIS

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List

CARBON MONOXIDE (630-08-0)

0.1 %

Component Analysis - Inventory

Component	CAS	US	CA	EU	AU	CH	JP	KR	CN	NZ
ACETYLENE, DISSOLVED	630-08-0	Yes	DSL	EIN	Yes	Yes	Yes	Yes	Yes	Yes

SECTION 16. OTHER INFORMATION

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSL - Domestic Substances List; EEC - European Economic Community; EINECS - European Inventory of Existing Commercial Chemical Substances; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; JP - Japan; Kow - Octanol/water partition coefficient; KR - Korea; LEL - Lower Explosive Limit; LOLI - List Of Lists™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PH - Philippines; RCRA - Resource Conservation and Recovery Act; RID - European Rail Transport; RTECS - Registry of Toxic Effects of Chemical Substances®; SARA - Superfund Amendments and Reauthorization Act; STEL - Short-term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; UEL - Upper Explosive Limit; US - United States

Other Information

Matheson Tri-Gas, Inc. makes no express or implied warranties, guarantees or representations regarding the product or the information herein, including but not limited to any implied warranty or merchantability or fitness for use. Matheson Tri-Gas, Inc. shall not be liable for any personal injury, property or other damages of any nature, whether compensatory, consequential, exemplary, or otherwise, resulting from any publication, use or reliance upon the information herein.