Specialty Chemical Products
"Distilling Pure Solutions"

Safety Data Sheet

Material Name: CARBON MONOXIDE **SDS ID: 00232334**

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
CARBON MONOXIDE

Synonyms
CARBON OXIDE; CARBONIC OXIDE; CARBON OXIDE (CO); FLUE GAS; UN 1016; CO;

Chemical Family
inorganic, Gas

Product Use
Industrial and Specialty Gas Applications.

Restrictions on Use
None known.

Details of the supplier of the safety data sheet
SPECIALTY CHEMICAL PRODUCTS
1407 Pennsylvania Ave.
South Houston, TX 77587
Phone: 713-944-0900
Emergency Phone #: Outside the US: 703-527-3887 (Call collect)
Fax: 1-800-424-9300 (CHEMTREC)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
Flammable Gases - Category 1
Gases Under Pressure - Compressed gas
Acute Toxicity - Inhalation - Gas - Category 3
Reproductive Toxicity - Category 1A
Specific Target Organ Toxicity - Single Exposure - Category 1 (circulatory system, nervous system)
Specific Target Organ Toxicity - Repeated Exposure - Category 2 (blood, heart)
Hazardous to the Aquatic Environment - Chronic - Category 4

GHS Label Elements

Symbol(s)

Signal Word

Danger

Hazard Statement(s)
Extremely flammable gas.
Contains gas under pressure; may explode if heated.
Toxic if inhaled.
May damage fertility or the unborn child.
Causes damage to organs.
May cause damage to organs through prolonged or repeated exposure.
May cause long lasting harmful effects to aquatic life.

Precautionary Statement(s)

Prevention
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flame/hot surfaces - No smoking.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not breathe dust/fume/gas/mist/vapours/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.

Response
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources if safe to do so.
If exposed: Call a POISON CENTER or doctor/physician.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER or doctor.

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Protect from sunlight.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Statement of Unknown Toxicity
100% of the mixture consists of ingredient(s) of unknown acute toxicity.

Other Hazards
Rapid release of compressed gas may cause frostbite.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
630-08-0	CARBON MONOXIDE	100

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 swallowed, get medical attention.

Most Important Symptoms/Effects

Acute
Frostbite, circulatory system damage, nervous system damage.

Delayed
blood damage, heart damage, Reproductive Effects.

Note to Physicians
For inhalation, consider oxygen.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media
carbon dioxide, regular dry chemical, water spray. alcohol resistant foam. Large fires: Use regular foam or flood with fine water spray.

Unsuitable Extinguishing Media
None known.

Special Hazards Arising from the Chemical
Severe fire hazard. Vapor/air mixtures are explosive. Containers may rupture or explode if exposed to heat.

Advice for firefighters
Oxides of carbon.

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.

Special Protective Equipment and Precautions for Firefighters
Wear personal protective clothing and equipment such as self-contained breathing apparatus (SCBA) for protection against possible exposure.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up
Leaking gas fire: Do not extinguish, unless leak can be stopped safely. 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. Ventilate closed spaces before entering. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304).

Environmental Precautions
Avoid release to the environment.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling
Keep away from heat/sparks/open flame/hot surfaces - No smoking. Do not breathe gas. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use Personal Protective equipment as required.

Conditions for Safe Storage, Including any Incompatibilities
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Protect from sunlight.

Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.

Incompatible Materials
oxidizing materials, halogens, metal oxides, metals, combustible materials, lithium

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

CARBON MONOXIDE	630-08-0
ACGIH:	25 ppm TWA
NIOSH:	35 ppm TWA; 40 mg/m3 TWA
	200 ppm Ceiling; 229 mg/m3 Ceiling
	1200 ppm IDLH
OSHA (US):	50 ppm TWA; 55 mg/m3 TWA
Mexico:	50 ppm TWA LMPE-PPT; 55 mg/m3 TWA LMPE-PPT
	400 ppm STEL [LMPE-CT]; 400 mg/m3 STEL [LMPE-CT]

EU - Occupational Exposure (98/24/EC) - Binding Biological Limit Values and Health Surveillance Measures
There are no biological limit values for any of this product's components.

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)
CARBON MONOXIDE (630-08-0)
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)

Engineering Controls
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.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection
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.

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

Respiratory Protection
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

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

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Not available	Physical State	gas
Odor	odorless	Color	colorless
Odor Threshold	Not available	pH	Not available
Melting Point	-205 °C (-337 °F)	Boiling Point	-191.5 °C (-313 °F)
Freezing point	Not available	Evaporation Rate	Not available
Boiling Point Range	Not available	Flammability (solid, gas)	Not available
Autoignition	700 °C (1292 °F)	Flash Point	Not available
Lower Explosive Limit	>=12.5 % (by volume)	Decomposition	Not available
Upper Explosive Limit	74 % (by volume)	Vapor Pressure	760 mmHg at -191 °C
Vapor Density (air=1)	0.968	Specific Gravity (water=1)	Not available
Water Solubility	2.3 % (@ 20 °C)	Partition coefficient: n-octanol/water	Not available
Viscosity	0.01657 cp	Solubility (Other)	Not available
Density	1.25 g/L at 0 °C	Physical Form	gas
Taste	tasteless	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

Reactivity
No reactivity hazard is expected.

Chemical Stability
Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions
Will not polymerize.

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.

Incompatible Materials
oxidizing materials, halogens, metal oxides, metals, combustible materials, lithium

Hazardous decomposition products
Oxides of carbon

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation
changes in body temperature, changes in blood pressure, nausea, vomiting, chest pain, difficulty breathing, irregular
heartbeat, headache, drowsiness, fatigue, dizziness, Disorientation, hallucinations, pain in extremities, tremors, loss of coordination, hearing loss, visual disturbances, eye damage, bluish skin color, suffocation, blood disorders, convulsions, coma, loss of appetite, heart disorders, heart damage, nerve damage, Reproductive Effects, birth defects, brain damage

Skin Contact
blisters, frostbite

Eye Contact
frostbite, blurred vision

Ingestion
ingestion of a gas is unlikely

Acute and Chronic Toxicity

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

Immediate Effects
Frostbite, circulatory system damage, nervous system damage.

Delayed Effects
blood, heart, Reproductive Effects.

Irritation/Corrosivity Data
No data available.

Respiratory Sensitization
No data available.

Dermal Sensitization
No data available.

Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA

Germ Cell Mutagenicity
No data available.

Tumorigenic Data
No data available

Reproductive Toxicity
No data available.

Specific Target Organ Toxicity - Single Exposure
blood, heart, nervous system,

Specific Target Organ Toxicity - Repeated Exposure
blood, heart, nervous system, reproductive system.

Aspiration hazard
No data available.

Medical Conditions Aggravated by Exposure
blood system disorders, heart or cardiovascular disorders, hormonal disorders, respiratory disorders

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 LOLI ecotoxicity data are available for this product's components

Persistence and Degradability
No information available for the product.

Bioaccumulative Potential

No information available for the product.

Mobility
No information available for the product.

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
Hazard Class: 2.3
UN/NA #: UN1016
Required Label(s): 2.3 2.1
Additional information: (Toxic-Inhalation Hazard Zone D)

IMDG Information:
Shipping Name:Carbon monoxide, compressed
Hazard Class: 2.3
UN#: UN1016
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.

SARA Section 311/312 (40 CFR 370 Subparts B and C)
Acute Health: Yes Chronic Health: Yes Fire: Yes Pressure: Yes Reactivity: 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

CARBON MONOXIDE	630-08-0
Repro/Dev. Tox	developmental toxicity , 7/1/1989

Canadian WHMIS Ingredient Disclosure List (IDL)
Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

CARBON MONOXIDE	630-08-0
	0.1 %

WHMIS Classification
A„ B1„ D1A„ D2A.

Component Analysis - Inventory
CARBON MONOXIDE (630-08-0)

US	CA	EU	AU	PH	JP - ENCS	JP - ISHL	KR - KECI/KECL	KR - TCCA	CN	NZ	MX	TW
Yes	DSL	EIN	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes

Section 16 - OTHER INFORMATION

NFPA Ratings
Health: 3 Fire: 4 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes
Updated: 05/01/2015

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; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; 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; LLV - Level Limit Value; 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; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; 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

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