

### SECTION 1: Identification

#### 1.1. Identification

Product form : Substance  
 Substance name : Carbonyl sulfide  
 CAS-No. : 463-58-1  
 Product code : SG-1001-00305  
 Formula : COS

#### 1.2. Recommended use and restrictions on use

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

#### 1.3. Supplier

Air Liquide USA LLC and its affiliates  
 9811 Katy Freeway, Suite 100  
 Houston, TX 77024 - USA  
 T 1-800-819-1704  
[www.us.airliquide.com](http://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

Flammable gases Category 1 H220 Extremely flammable gas  
 Gases under pressure H280 Contains gas under pressure; may explode if heated  
 Liquefied gas  
 Acute toxicity (inhalation:gas) Category 3 H331 Toxic if inhaled  
 Full text of H statements : see section 16

#### 2.2. GHS Label elements, including precautionary statements

##### GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H220 - Extremely flammable gas  
 H280 - Contains gas under pressure; may explode if heated  
 H331 - Toxic if inhaled  
 CGA-HG04 - May form explosive mixtures with air  
 CGA-HG11 - Symptoms may be delayed  
 CGA-HG16 - Extended exposure to gas reduces the ability to smell sulfides.

Precautionary statements (GHS-US) :

P202 - Do not handle until all safety precautions have been read and understood.  
 P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking.  
 P261 - Avoid breathing gas.  
 P271 - Use only outdoors or in a well-ventilated area.  
 P280 - Wear eye protection, face protection, protective gloves, protective clothing.  
 P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
 P403 - Store in a well-ventilated place.  
 P405 - Store locked up.  
 P501 - Dispose of contents/container in accordance with local/regional/national/international regulations  
 P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing  
 P381 - Eliminate all ignition sources if safe to do so.  
 P307+P311 - If exposed: Call a poison center/doctor  
 P284 - Wear respiratory protection. Consult respirator supplier's product information for the

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selection of the appropriate respiratory protection.  
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-PG18 - When returning cylinder, install leak tight valve outlet cap or plug  
CGA-PG21 - Open valve slowly  
CGA-PG29 - Do not depend on odor to detect presence of gas

### 2.3. Other hazards which do not result in classification

No additional information available

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/Information on ingredients

### 3.1. Substances

Name	Product identifier	%	GHS-US classification
Carbonyl sulfide (Main constituent)	(CAS-No.) 463-58-1	> 99.9	Flam. Gas 1, H220 Press. Gas (Liq.), H280 Acute Tox. 3 (Inhalation:gas), H331

Full text of hazard classes and H-statements : see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First-aid measures

### 4.1. 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. Apply artificial respiration with bag and mask if breathing stopped. Get immediate medical advice/attention.

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

First-aid measures after eye 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 (acute and delayed)

Symptoms/effects after inhalation : Toxic if inhaled.

Symptoms/effects after skin contact : Adverse effects not expected from this product.

Symptoms/effects after eye contact : Adverse effects not expected from this product.

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

Symptoms/effects upon intravenous administration : Not known.

Most important symptoms and effects, both acute and delayed : May act principally on the central nervous system, with death resulting from respiratory paralysis. Refer to section 11.

Chronic symptoms : Adverse effects not expected from this product.

### 4.3. Immediate medical attention and special treatment, if necessary

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

## SECTION 5: Fire-fighting measures

### 5.1. Suitable (and unsuitable) extinguishing media

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

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

### 5.2. Specific hazards arising from the chemical

Fire hazard : This product is flammable.

Explosion hazard : Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. May form flammable/explosive vapor-air mixture.

Reactivity : None known.

### 5.3. Special protective equipment and precautions for fire-fighters

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.

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- 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

#### 6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Ensure adequate ventilation.

##### 6.1.1. For non-emergency personnel

- Protective equipment : Wear protective equipment consistent with the site emergency plan.
- Emergency procedures : Evacuate personnel to a safe area. 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. Remove ignition sources. Monitor concentration of released product. Consider the risk of potentially explosive atmospheres. Wear self-contained breathing apparatus when entering atmospheres of unknown contaminant concentration until proven to be safe.

#### 6.2. Environmental precautions

- Try to stop release if without risk.

#### 6.3. Methods and material for containment and cleaning up

- For containment : Try to stop release if without risk.
- Methods for cleaning up : Dispose of contents/container in accordance with local/regional/national/international regulations.
- Methods and material for containment and cleaning up : Ventilate area. Keep area evacuated and free from ignition sources until any spilled liquid has evaporated (ground free from frost).

#### 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 only with equipment rated for cylinder pressure. Close valve after each use and when empty. Handle empty containers with care because residual vapors are flammable. In use, may form flammable vapor-air mixture.
- 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. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Use only non-sparking tools.
- 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. Proper grounding procedures to avoid static electricity should be followed.
- Storage conditions : Do not expose to temperatures exceeding 52 °C/ 125 °F. Keep container closed when not in use. Protect cylinders from physical damage; do not drag, roll, slide or drop. Store in well ventilated area. Store locked up.
- Incompatible products : None known.
- Incompatible materials : Oxidizing materials. Air.
- Conditions for safe storage, including any incompatibilities : Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Container valve guards or caps should be in place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials. Segregate from oxidant gases and other oxidants in store. All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere.

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### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

##### Carbonyl sulfide (463-58-1)

ACGIH	ACGIH TWA (ppm)	5 ppm
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#### 8.2. Appropriate engineering controls

Appropriate engineering controls	: Ensure exposure is below occupational exposure limits (where available). Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Consider the use of a work permit system e.g. for maintenance activities. Alarm detectors should be used when toxic gases may be released.
Environmental exposure controls	: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

#### 8.3. Individual protection measures/Personal protective equipment

##### 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.

##### Respiratory protection:

Wear a respirator when performing non-routine tasks not limited to line breaking or sampling. Wear a respirator during routine operations if determined to be necessary during a process-specific review. Consult respirator suppliers' product information or their representatives for the selection of the appropriate respirator. See Sections 5 & 6.

##### Thermal hazard protection:

None necessary during normal and routine operations.

##### Other information:

Wear safety shoes while handling containers. Keep suitable chemically resistant protective clothing readily available for emergency use. 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	: Sulfide-like Stench.
Odor threshold	: No data available
pH	: Not applicable.
Melting point	: No data available
Freezing point	: -139 °C
Boiling point	: No data available
Critical temperature	: 106.65 °C
Critical pressure	: 5880 kPa
Flash point	: No data available
Relative evaporation rate (butyl acetate=1)	: No data available
Relative evaporation rate (ether=1)	: Not applicable for gases and gas mixtures.
Flammability (solid, gas)	: See Section 2.1 and 2.2
Vapor pressure	: 6343.1767068 mbar
Relative vapor density at 20 °C	: 2.1
Relative density	: 1.2

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Relative gas density	: Similar to air
Solubility	: No data available
Log Pow	: Not applicable for inorganic products.
Auto-ignition temperature	: 200 °C
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: Not applicable.
Explosion limits	: No data available LEL: 12 (12 - 28.5) vol % AS400
Explosive properties	: Without adequate ventilation formation of explosive mixtures may be possible.
Oxidizing properties	: None.

### 9.2. Other information

Gas group	: Press. Gas (Liq.)
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## SECTION 10: Stability and reactivity

### 10.1. Reactivity

None known.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Can form explosive mixture with air.

### 10.4. Conditions to avoid

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

### 10.5. Incompatible materials

Oxidizing materials. Air.

### 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 (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Inhalation:gas: Toxic if inhaled.

Carbonyl sulfide (463-58-1)	
LC50 inhalation rat (ppm)	850 ppm/4h
ATE US (gases)	850 ppmV/4h

Skin corrosion/irritation	: Not classified pH: Not applicable.
Serious eye damage/irritation	: Not classified pH: Not applicable.
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
Viscosity, kinematic	: No data available
Symptoms/effects after inhalation	: Toxic if inhaled.
Symptoms/effects after skin contact	: Adverse effects not expected from this product.

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Symptoms/effects after eye contact	: Adverse effects not expected from this product.
Symptoms/effects after ingestion	: Ingestion is not considered a potential route of exposure.
Symptoms/effects upon intravenous administration	: Not known.
Most important symptoms and effects, both acute and delayed	: May act principally on the central nervous system, with death resulting from respiratory paralysis. Refer to section 11.
Chronic symptoms	: Adverse effects not expected from this product.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general	: No data available.
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### 12.2. Persistence and degradability

#### Carbonyl sulfide (463-58-1)

Persistence and degradability	Not applicable for inorganic products
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### 12.3. Bioaccumulative potential

#### Carbonyl sulfide (463-58-1)

Log Pow	Not applicable for inorganic products.
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Bioaccumulative potential	No data available.
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### 12.4. Mobility in soil

#### Carbonyl sulfide (463-58-1)

Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
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### 12.5. Other adverse effects

Effect on ozone layer	: No known effects from this product.
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#### Carbonyl sulfide (463-58-1)

1990 Hazardous Air Pollutant (Clean Air Act)	Yes
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## SECTION 13: Disposal considerations

### 13.1. Disposal 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 gas should be flared through a suitable burner with flash back arrestor. Do not discharge into areas where there is a risk of forming an explosive mixture with air.
Product/Packaging disposal recommendations	: Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at <a href="http://www.cganet.com">www.cganet.com</a> for more guidance on suitable disposal methods.

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

Transport document description	: UN2204 Carbonyl sulfide, 2.3
UN-No.(DOT)	: UN2204
Proper Shipping Name (DOT)	: Carbonyl sulfide
Class (DOT)	: 2.3 - Class 2.3 - Poisonous gas 49 CFR 173.115
Hazard labels (DOT)	: 2.3 - Poison gas 2.1 - Flammable gas



DOT Packaging Non Bulk (49 CFR 173.xxx)	: 304
DOT Packaging Bulk (49 CFR 173.xxx)	: 314;315

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DOT Special Provisions (49 CFR 172.102)	: 3 - This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone C (see 173.116(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter. B14 - Each bulk packaging, except a tank car or a multi-unit-tank car tank, must be insulated with an insulating material so that the overall thermal conductance at 15.5 C (60 F) is no more than 1.5333 kilojoules per hour per square meter per degree Celsius (0.075 Btu per hour per square foot per degree Fahrenheit) temperature differential. Insulating materials must not promote corrosion to steel when wet.
DOT Packaging Exceptions (49 CFR 173.xxx)	: None
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: Forbidden
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	: Forbidden
DOT Vessel Stowage Location	: D - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters"
Emergency Response Guide (ERG) Number	: 119
Other information	: No supplementary information available.
Special transport precautions	: 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.

### Transportation of Dangerous Goods

Transport document description	: UN2204 CARBONYL SULPHIDE, 2.3 (2.1)
UN-No. (TDG)	: UN2204
Proper Shipping Name	: CARBONYL SULPHIDE
TDG Primary Hazard Classes	: 2.3 - Class 2.3 - Toxic Gas.
TDG Subsidiary Classes	: 2.1
TDG Special Provisions	: 23 - (1) A consignor of these dangerous goods must include, except for UN1005, ANHYDROUS AMMONIA, the words "toxic by inhalation" or "toxic — inhalation hazard" or "toxique par inhalation" or "toxicité par inhalation" in the following places, unless the words are already part of the shipping name: (a) on a shipping document, immediately after the description of the dangerous goods; (b) on a small means of containment, next to the shipping name of the dangerous goods; and (c) on a large means of containment, next to the placard for the primary class of the dangerous goods or the placard for the subsidiary class, if any. For example, the notation on a shipping document would be "UN1935, CYANIDE SOLUTION, N.O.S., Class 6.1, PG I, toxic by inhalation". (2) This special provision does not apply to a person who transports these dangerous goods in accordance with an exemption set out in sections 1.15, 1.17 or 1.17.1 of Part 1 (Coming Into Force, Repeal, Interpretation, General Provisions and Special Cases). (3) A consignor of UN1005, ANHYDROUS AMMONIA, must include the words "inhalation hazard" or "dangereux par inhalation": (a) on a shipping document, immediately after the shipping name of the dangerous goods; and (b) on a small means of containment, next to the shipping name of the dangerous goods. When UN1005, ANHYDROUS AMMONIA, is contained in a large means of containment on which is affixed the anhydrous ammonia placard, the words "Anhydrous Ammonia, Inhalation Hazard" or "Ammoniac anhydre, dangereux par inhalation" must be displayed next to the placard in accordance with paragraph 4.18.2(b). SOR/2014-306,38 - A person must not handle, offer for transport or transport these dangerous goods in a large means of containment if they are in direct contact with the large means of containment. SOR/2014-306
ERAP Index	: 500
Explosive Limit and Limited Quantity Index	: 0
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index	: Forbidden
Passenger Carrying Ship Index	: Forbidden

### Transport by sea

Transport document description (IMDG)	: UN 2204 CARBONYL SULPHIDE
UN-No. (IMDG)	: 2204

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Proper Shipping Name (IMDG) : CARBONYL SULPHIDE  
MFAG-No 119

### Air transport

Forbidden

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Carbonyl sulfide (463-58-1)

Listed on the United States TSCA (Toxic Substances Control Act) inventory  
Subject to reporting requirements of United States SARA Section 313

CERCLA RQ	100 lb
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### 15.2. International regulations

#### CANADA

#### Carbonyl sulfide (463-58-1)

Listed on the Canadian DSL (Domestic Substances List)

#### EU-Regulations

#### Carbonyl sulfide (463-58-1)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

#### National regulations

#### Carbonyl sulfide (463-58-1)

Listed on the AICS (Australian Inventory of Chemical Substances)  
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory  
Listed on the Japanese ISHL (Industrial Safety and Health Law)  
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 INSQ (Mexican National Inventory of Chemical Substances)  
Listed on the TCSI (Taiwan Chemical Substance Inventory)

### 15.3. US State regulations

#### Carbonyl sulfide (463-58-1)

State or local regulations	U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List U.S. - Pennsylvania - RTK (Right to Know) List
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## SECTION 16: Other information

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Revision date : 11/08/2018  
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:

H220	Extremely flammable gas
H280	Contains gas under pressure; may explode if heated
H331	Toxic if inhaled

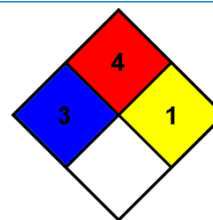


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NFPA health hazard	: 3 - Materials that, under emergency conditions, can cause serious or permanent injury.
NFPA fire hazard	: 4 - Materials that rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and burn readily.
NFPA reactivity	: 1 - Materials that in themselves are normally stable but can become unstable at elevated temperatures and pressures.



SDS US (GHS HazCom 2012)

*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 USA LLC and its affiliates' 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.*