

## Section 1: Product and Company Identification

**Absolute Accuracy**  
4591 S Wayside Dr  
Houston, TX 77087  
(832) 571-2387

Product Code: 2789

**Synonyms:**  
**Recommended Use:**  
**Usage Restrictions:**

## Section 2: Hazards Identification



**Danger**

**Hazard Classification:**

Flammable (Category 1)  
Gases Under Pressure

**Hazard Statements:**

Contains gas under pressure; may explode if heated  
Extremely flammable gas  
Toxic to aquatic life

**Precautionary Statements**

**Prevention:**

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

**Response:**

Eliminate all ignition sources if safe to do so.  
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

**Storage:**

Protect from sunlight.  
Store in well-ventilated place.

## Section 3: Composition/Information on Ingredients

	CAS #	Concentration
Carbonyl Sulfide	463-58-1	ppm 10
Hydrogen Sulfide	7783-06-4	ppm 10
Hydrogen	1333-74-0	balance

	Chemical Substance	Chemical Family	Trade Names
Carbonyl Sulfide	CARBONYL SULFIDE	Carbonyls	CARBON OXYSULFIDE; CARBON OXIDE SULFIDE; OXYCARBON SULFIDE; COS; UN 2204
Hydrogen Sulfide	HYDROGEN SULFIDE	Inorganic gases	HYDROGEN SULFIDE (H <sub>2</sub> S); DIHYDROGEN MONOSULFIDE; DIHYDROGEN SULFIDE; HYDROSULFURIC ACID; SULFUR DIHYDRIDE; SULFURETED HYDROGEN; SULFUR HYDRIDE; STINK DAMP; SEWER GAS; RCRA U135; UN 1053; H <sub>2</sub> S
Hydrogen	HYDROGEN	Inorganic gases	HYDROGEN GAS; HYDROGEN COMPRESSED; HYDROGEN (H <sub>2</sub> ); DIHYDROGEN; UN 1049; H <sub>2</sub>

## Section 4: First Aid Measures

	Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
Carbonyl Sulfide	Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.	Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	If a large amount is swallowed, get medical attention.	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.	For inhalation, consider oxygen.
Hydrogen Sulfide	Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.	Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	If a large amount is swallowed, get medical attention.	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.	For inhalation, consider oxygen.
Hydrogen	Wash exposed skin with soap and water.	Flush eyes with plenty of water.	If a large amount is swallowed, get medical attention.	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.	For inhalation, consider oxygen.

## Section 5: Fire Fighting Measures

	Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters
<b>Carbonyl Sulfide</b>	Let burn unless leak can be stopped immediately. Large fires: Use regular foam or flood with fine water spray.	Oxides of carbon, hydrogen sulfide	<ul style="list-style-type: none"> <li>Any self-contained breathing apparatus with a full facepiece. Use chemical protective suit.</li> <li>Use chemical protective suit.</li> </ul>
<b>Hydrogen Sulfide</b>	Let burn unless leak can be stopped immediately. Large fires: Use regular foam or flood with fine water spray.	Sulfur oxides	<ul style="list-style-type: none"> <li>Any self-contained breathing apparatus with a full facepiece.</li> <li>Protective material types: butyl rubber, polyvinyl chloride (PVC), neoprene</li> </ul>
<b>Hydrogen</b>	Carbon dioxide, regular dry chemical Large fires: Flood with fine water spray.	None known	<ul style="list-style-type: none"> <li>Any self-contained breathing apparatus with a full facepiece.</li> <li>Any self-contained breathing apparatus with a full facepiece.</li> </ul>

## Section 6: Accidental Release Measures

	Personal Precautions	Environmental Precautions	Methods for Containment
<b>Carbonyl Sulfide</b>	Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.
<b>Hydrogen Sulfide</b>	Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet. For tank, rail car or tank truck: 800 meters (1/2 mile). Do not touch spilled material.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Remove sources of ignition. Reduce vapors with water spray. Do not get water directly on material.
<b>Hydrogen</b>	Keep unnecessary people away, isolate hazard area and deny entry. Do not touch spilled material. Ventilate closed spaces before entering.	Avoid heat, flames, sparks and other sources of ignition.	Reduce vapors with water spray. Remove sources of ignition.

	Methods for Cleanup	Other Information
<b>Carbonyl Sulfide</b>	Stop leak, evacuate and ventilate area.	Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).
<b>Hydrogen Sulfide</b>	Collect runoff for disposal as potential hazardous waste. Dike for later disposal. Absorb with sand or other non-combustible material. Add an alkaline material (lime, crushed limestone, sodium bicarbonate, or soda ash).	Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).
<b>Hydrogen</b>	Stop leak if possible without personal risk.	None

## Section 7: Handling and Storage

	Handling	Storage
<b>Carbonyl Sulfide</b>	Store and handle in accordance with all current regulations and standards.	Not available

	Handling	Storage
Hydrogen Sulfide	Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Store in a cool, dry place. Store in a well-ventilated area. Avoid contact with light. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355.30). Keep separated from incompatible substances.	Subject to handling regulations: U.S. OSHA 29 CFR 1910.119.
Hydrogen	Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.

## Section 8: Exposure Controls/Personal Protection

	Exposure Guidelines
Carbonyl Sulfide	CARBONYL SULFIDE: No occupational exposure limits established.
Hydrogen Sulfide	HYDROGEN SULFIDE: 20 ppm OSHA ceiling 50 ppm OSHA peak 10 minute(s) (once if no other measurable exposure occurs) 10 ppm (14 mg/m <sup>3</sup> ) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 15 ppm (21 mg/m <sup>3</sup> ) OSHA STEL (vacated by 58 FR 35338, June 30, 1993) 10 ppm ACGIH TWA 15 ppm ACGIH STEL 10 ppm (15 mg/m <sup>3</sup> ) NIOSH recommended ceiling 10 minute(s) TLV-TWA: 1ppm Upper respiratory irritation (ACGIH)
Hydrogen	HYDROGEN: ACGIH (simple asphyxiant)

### Engineering Controls

Handle only in fully enclosed systems.

	Eye Protection	Skin Protection	Respiratory Protection
Carbonyl Sulfide	Wear splash resistant safety goggles with a face shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	Wear appropriate chemical resistant clothing.	Any self-contained breathing apparatus with a full facepiece. Use chemical protective suit.
Hydrogen Sulfide	Wear splash resistant safety goggles with a face shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	Wear appropriate chemical resistant clothing.	Any self-contained breathing apparatus with a full facepiece.
Hydrogen	Eye protection not required, but recommended.	Protective clothing is not required.	Any self-contained breathing apparatus with a full facepiece.

### General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

## Section 9: Physical and Chemical Properties

	Physical State	Appearance	Color	Change in Appearance	Physical Form	Odor	Taste
Carbonyl Sulfide	Gas	Colorless	Colorless	N/A	Gas	Sulfide odor	N/A
Hydrogen Sulfide	Gas	Colorless	Colorless	N/A	Gas	Rotten egg odor	N/A
Hydrogen	Gas	Colorless	Colorless	N/A	Gas	Odorless	Tasteless

	Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits	Lower Explosive Limits
Carbonyl Sulfide	Not available	Not available	N/A	Not available	0.29	0.12
Hydrogen Sulfide	Flammable	Not available	Not available	500 F (260 C)	45.5%	3.9%
Hydrogen	Flammable gas (burns at all ambient temperatures)	Not available	Not available	752 F (400 C)	0.75	0.04

	Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity
Carbonyl Sulfide	-58 F (-50 C)	-218 F (-139 C)	Not available	2.1 (Air=1)	1.24 @ -87 C	Soluble	Not applicable	Not available	Not applicable	Not available
Hydrogen Sulfide	-78 to -77 F (-61 to -60.3 C)	-123 F (-86 C)	15200 mmHg @ 25 C	1.2 (Air=1)	1.192	2.58-2.9% @ 20 C	4.5-<7 (saturated solution)	0.13 ppm	Not applicable	0.0128 cP @ 25 C
Hydrogen	-423 F (-253 C)	-434 F (-259 C)	760 mmHg @ -253 C	0.07 (Air=1)	Not applicable	1.82% @ 20 C	Not applicable	Not available	Not applicable	0.008957 cP @ 26.8 C

	Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
Carbonyl Sulfide	60.07	C-O-S	Not available	Not available	100%	Not applicable	Alcohol
Hydrogen Sulfide	34.08	H <sub>2</sub> -S	1.539 g/L @ 0 C	Not available	Not available	Not applicable	Soluble: Carbon disulfide, alcohol, ether, glycerol, gasolines, kerosene, crude oil, alkali solutions
Hydrogen	2	H <sub>2</sub>	0.08987 g/L @ 0 C	Not available	Not available	Not applicable	Soluble: Not available

## Section 10: Stability and Reactivity

	Stability	Conditions to Avoid	Incompatible Materials
Carbonyl Sulfide	Contact with water or moist air may form flammable and/or toxic gases or vapors.	Contact with water or moist air may form flammable and/or toxic gases or vapors.	Bases, oxidizing materials
Hydrogen Sulfide	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Combustible materials, metals, oxidizing materials, halogens, metal oxides, metal salts, bases, rust, oxidants, oxygen, copper powder, acetaldehyde, silver fulminate

	Stability	Conditions to Avoid	Incompatible Materials
Hydrogen	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Metals, oxidizing materials, metal oxides, combustible materials, halogens, metal salts, halo carbons, nitrogen trifluoride, oxygen difluoride, magnesium and calcium carbonate, sodium, potassium

	Hazardous Decomposition Products	Possibility of Hazardous Reactions
Carbonyl Sulfide	Oxides of carbon, hydrogen sulfide	Will not polymerize.
Hydrogen Sulfide	Oxides of sulfur	Will not polymerize.
Hydrogen	Miscellaneous decomposition products	Will not polymerize.

## Section 11: Toxicology Information

### Acute Effects

	Oral LD50	Dermal LD50	Inhalation
Carbonyl Sulfide	Inhalation, LC50, 1 hr, mouse = 1700 ppmv.	Not available	Irritation, nausea, headache, symptoms of drunkenness, convulsions, coma
Hydrogen Sulfide	444 ppm inhalation-rat LC50	Irritation 0.000125 ppm/5 hour(s) eyes-human	Irritation, lack of sense of smell, sensitivity to light, nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, disorientation, tremors, visual disturbances, suffocation, lung congestion, internal bleeding, heart damage, nerve damage, brain damage, coma, death
Hydrogen	Not available	Not available	Nausea, vomiting, difficulty breathing, irregular heartbeat, headache, fatigue, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, convulsions, unconsciousness, coma

	Eye Irritation	Skin Irritation	Sensitization
Carbonyl Sulfide	Irritation, blisters, tearing	Irritation, nausea, headache, symptoms of drunkenness	Acute toxicity, Category 3, inhalation; H331: Toxic if inhaled.
Hydrogen Sulfide	Irritation, sensitivity to light, visual disturbances	Irritation liquid: frostbite	Acute toxicity, Category 2, inhalation; H330: Fatal if inhaled. Specific Target Organ Toxicity (single exposure), Category 3; H335: May cause respiratory irritation. Hazardous to the aquatic environment, Acute Category 1; H400: Very toxic to aquatic life
Hydrogen	Not irritating	Not irritating	Difficulty breathing

### Chronic Effects

	Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
Carbonyl Sulfide	Not available	Not available	Not available	No data
Hydrogen Sulfide	Not available	Not available	Available.	No data
Hydrogen	Not available	Not available	Not available	No data

## Section 12: Ecological Information

### Fate and Transport

	Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
Carbonyl Sulfide	Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available

<b>Hydrogen Sulfide</b>	Fish toxicity: Acute LC50 7 ug/L Fresh water Fish - Fathead minnow - Pimephales promelas - FRY 96 hours; 14.9 ug/L 96 hour(s) LC50 (Mortality) Fathead minnow (Pimeph Invertebrate toxicity: 9730 ug/L 1.5 hour(s) (Mortality) Mediterranean mussel (Mytilus galloprovincialis) Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Highly toxic to aquatic life.	Not available	Not available
<b>Hydrogen</b>	Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available

## Section 13: Disposal Considerations

<b>Carbonyl Sulfide</b>	Dispose in accordance with all applicable regulations.
<b>Hydrogen Sulfide</b>	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U135.
<b>Hydrogen</b>	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

## Section 14: Transportation Information

### U.S. DOT 49 CFR 172.101

#### DOT Information For This Mixture

<b>Shipping Name</b>	Compressed gas, flammable, n.o.s. (Hydrogen, Carbonyl Sulfide)
<b>UN Number</b>	UN1954
<b>Hazard Class</b>	2.1
<b>Hazard Information</b>	FLAMMABLE GAS

### Individual Component Information

	Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requirements	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Description
Carbonyl Sulfide	Carbonyl sulfide	UN2204	2.3	Not applicable	2.3; 2.1	Forbidden	Forbidden	Toxic-Inhalation Hazard Zone C
Hydrogen Sulfide	Hydrogen sulfide	UN1053	2.3	Not applicable	2.3; 2.1	Forbidden	Forbidden	Toxic-Inhalation Hazard Zone B
Hydrogen	Hydrogen, compressed	UN1049	2.1	Not applicable	2.1	Forbidden	150 kg	None

### Canadian Transportation of Dangerous Goods

	Shipping Name	UN Number	Class	Packing Group / Risk Group
Carbonyl Sulfide	Carbonyl sulphide	UN2204	2.3; 2.1	Not applicable
Hydrogen Sulfide	HYDROGEN SULFIDE; or HYDROGEN SULPHIDE	UN1053	2.3; 2.1	Not applicable
Hydrogen	Hydrogen, compressed	UN1049	2.1	Not applicable

## Section 15: Regulatory Information

### U.S. Regulations

	CERCLA Sections	SARA 355.30	SARA 355.40
Carbonyl Sulfide	100 LBS RQ	Not regulated.	Not regulated.
Hydrogen Sulfide	100 LBS RQ	500 LBS TPQ	100 LBS RQ
Hydrogen	Not regulated.	Not regulated.	Not regulated.

### SARA 370.21

	Acute	Chronic	Fire	Reactive	Sudden Release
Carbonyl Sulfide	Yes	No	Yes	Yes	Yes
Hydrogen Sulfide	Yes	No	Yes	No	Yes
Hydrogen	Yes	No	Yes	No	Yes

### SARA 372.65

Carbonyl Sulfide	CARBONYL SULFIDE
Hydrogen Sulfide	HYDROGEN SULFIDE: Administrative stay issued Aug. 22, 1994



Hydrogen	Not regulated.
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### OSHA Process Safety

Carbonyl Sulfide	Not regulated.
Hydrogen Sulfide	1500 LBS TQ
Hydrogen	Not regulated.

### State Regulations

	<b>CA Proposition 65</b>
Carbonyl Sulfide	Not regulated.
Hydrogen Sulfide	Not regulated.
Hydrogen	Not regulated.

### Canadian Regulations

	<b>WHMIS Classification</b>
Carbonyl Sulfide	ABD1
Hydrogen Sulfide	A, B1, D1A, D2B.
Hydrogen	A, B1.

### National Inventory Status

	US Inventory (TSCA)	TSCA 12b Export Notification	Canada Inventory (DSL/NDSL)
Carbon yl Sulfide	Listed on inventory.	Not listed.	Not determined.
Hydrog en Sulfide	Listed on inventory.	Not listed.	Listed on inventory.
Hydrog en	Listed on inventory.	Not listed.	Listed on inventory.

## Section 16: Other Information

	<b>NFPA Rating</b>
Carbonyl Sulfide	HEALTH=3 FIRE=4 REACTIVITY=0
Hydrogen Sulfide	HEALTH=4 FIRE=4 REACTIVITY=0
Hydrogen	HEALTH=0 FIRE=4 REACTIVITY=0

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard