

**Safety Data Sheet** 

### Section 1: Product and Company Identification

188

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

Product Code: 188 Synonyms: N/A Recommended Use: CALIBRATION GAS Usage Restrictions: INDUSTRIAL CALIBRATION GAS ONLY

### Section 2: Hazards Identification



Hazard Classification: Gases Under Pressure

Hazard Statements: Contains gas under pressure; may explode if heated Toxic to aquatic life

**Precautionary Statements** 

**Storage:** Protect from sunlight. Store in well-ventilated place.

### Section 3: Composition/Information on Ingredients

	CAS #	Concentration
Hydrogen Sulfide	7783-06-4	25PPM
Oxygen	7782-44-7	18%
Methane	74-82-8	2.5%
Nitrogen	7727-37-9	BALANCE

	Chemical Substance	Chemical Family	Trade Names
Hydrogen Sulfide	HYDROGEN SULFIDE	Inorganic gases	HYDROGEN SULFIDE (H2S); DIHYDROGEN MONOSULFIDE; DIHYDROGEN SULFIDE; HYDROSULFURIC ACID; SULFUR DIHYDRIDE; SULFURETED HYDROGEN; SULFUR HYDRIDE; STINK DAMP; SEWER GAS; RCRA U135; UN 1053; H2S
Oxygen	OXYGEN, COMPRESSED GAS	Inorganic gases	OXYGEN; DIOXYGEN; MOLECULAR OXYGEN; OXYGEN MOLECULE; PURE OXYGEN; UN 1072; O2
Methane	METHANE, COMPRESSED GAS	Hydrocarbons, Aliphatic, Saturated	FIRE DAMP; MARSH GAS; METHYL HYDRIDE; NATURAL GAS; METHANE; UN 1971; R50; CH4
Nitrogen	NITROGEN, COMPRESSED GAS	Inorganic gases	DIATOMIC NITROGEN; DINITROGEN; NITROGEN; NITROGEN-14; NITROGEN GAS; UN 1066; N2

# Section 4: First Aid Measures

	Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
Hydrog en 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.
Oxygen	None expected	None expected	Not likely route of exposure	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.	None
Methan e	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.
Nitroge n	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
Hydrog en Sulfide	Let burn unless leak can be stopped immediately. Large fires: Use regular foam or flood with fine water spray.	Sulfur oxides	<ul> <li>Any self-contained breathing apparatus with a full facepiece.</li> <li>Protective material types: butyl rubber, polyvinyl chloride (PVC), neoprene</li> </ul>
Oxygen	Non-flammable. Use extinguishing agent appropriate for the material which is burning. Use water in large quantities for fires involving oxygen.	Oxides of burning material	<ul> <li>Respiratory protection may be needed for frequent or heavy exposure.</li> <li>None</li> </ul>
Methan e	Carbon dioxide, regular dry chemical Large fires: Use regular foam or flood with fine water spray.	Carbon monoxide, carbon dioxide, water	<ul> <li>Respiratory protection may be needed for frequent or heavy exposure. Any self-contained breathing apparatus with a full facepiece.</li> <li>Respiratory protection may be needed for frequent or heavy exposure. Any self-contained breathing apparatus with a full facepiece.</li> </ul>
Nitroge n	Non-flammable. Use suitable extinguishing media for surrounding fire. Cylinders may rupture or explode if exposed to heat.	Non-flammable	<ul> <li>Respiratory protection may be needed for frequent or heavy exposure.</li> </ul>

## Section 6: Accidental Release Measures

	Personal Precautions	Environmental Precautions	Methods for Containment	
Hydrog en Sulfide	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.	
Oxygen	Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering.	Avoid contact with combustible materials.	Stop leak if possible without personal risk.	
Methan e	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.	
Nitroge n	Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.	No significant effects from contamination expected.	Stop leak if possible without personal risk.	

	Methods for Cleanup	Other Information	
Hydrogen Sulfide	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).	
Oxygen	Stop leak and ventilate	None	
Methane	Not available	Not available	
Nitrogen	N/A	N/A	

## Section 7: Handling and Storage

	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.
Oxygen	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.
Methane	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.
Nitrogen	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.

# Section 8: Exposure Controls/Personal Protection

	Exposure Guidelines
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/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 15 ppm (21 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993) 10 ppm ACGIH TWA 15 ppm ACGIH STEL 10 ppm (15 mg/m3) NIOSH recommended ceiling 10 minute(s) TLV-TWA: 1ppm Upper respiratory irritation (ACGIH)
Oxygen	OXYGEN, COMPRESSED GAS: No occupational exposure limits established.
Methane	METHANE, COMPRESSED GAS: ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4): 1000 ppm ACGIH TWA METHANE: No occupational exposure limits established. ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4): 1000 ppm ACGIH TWA
Nitrogen	NITROGEN, COMPRESSED GAS: NITROGEN: ACGIH (simple asphyxiant)

#### **Engineering Controls**

Handle only in fully enclosed systems.

	Eye Protection	Skin Protection	Respiratory Protection
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.

	Eye Protection	Skin Protection	Respiratory Protection
Oxygen	Eye protection not required, but recommended.	Protective clothing is not required.	Respiratory protection may be needed for frequent or heavy exposure.
Methane	Eye protection not required, but recommended.	Protective clothing is not required.	Respiratory protection may be needed for frequent or heavy exposure. Any self- contained breathing apparatus with a full facepiece.
Nitrogen	Eye protection not required, but recommended.	Protective clothing is not required.	Respiratory protection may be needed for frequent or heavy exposure.

- 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
Hydro gen Sulfid e	Gas	Colorless	Colorless	N/A	Gas	Rotten egg odor	N/A
Oxyg en	Gas	Clear	Colorless	N/A	Gas	Odorless	Tasteless
Meth ane	Gas	Colorless	Colorless	N/A	Gas	Odorless	Tasteless
Nitro gen	Gas	Clear	Colorless	N/A	Gas	Odorless	Tasteless

	Flash Point	Flammability	Partition Coefficient	Autoignitio n Temperatur e	Upper Explosive Limits	Lower Explosive Limits
Hydr ogen Sulfid e	Flammable	Not available	Not available	500 F (260 C)	45.5%	3.9%
Oxyg en	Not flammable	Not available	Not available	Nonflammable	Nonflammable	Nonflammable
Meth ane	-369 F (-223 C)	Not available	724.44 (log = 2.87) (estimated from water solubility)	999 F (537 C)	15%	5%
Nitro gen	Not flammable	Not available	Not available	Nonflammable	Nonflammable	Nonflammable

	Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	рН	Odor Threshol d	Evaporati on Rate	Viscosi ty
Hy dro gen Sul fide	-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 (satur ated solutio n)	0.13 ppm	Not applicable	0.0128 cP @ 25 C
Ox yge n	-297 F (- 183 C)	-360 F (- 218 C)	760 mmHg @ -183 C	1.1 (Air=1)	Not applicable	3.2% @ 25 C	Not applic able	Not available	Not applicable	0.02075 cP @ 25 C
Me tha ne	-260 F (- 162 C)	-297 F (- 183 C)	760 mmHg @ -161 C	0.555 (Air=1)	Not applicable	3.5% @ 17 C	Not applic able	Not available	Not applicable	0.01118 cP @ 27 C
Nit rog en	-321 F (- 196 C)	-346 F (- 210 C)	760 mmHg @ -196 C	0.967 (Air=1)	Not applicable	1.6% @ 20 C	Not applic able	Not available	Not applicable	0.01787 cP @ 27 C

	Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
Hydr ogen Sulfi de	34.08	H2-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
Oxyg en	31.9988	02	1.309 g/L @ 25 C	Not available	Not applicable	Not applicable	Soluble: Alcohol
Meth ane	16.04	C-H4	0.717 g/L @ 0 C	Not available	Not applicable	Not applicable	Soluble: Alcohol, ether, benzene, organic solvents
Nitro gen	28.0134	N2	1.2506 g/L	Not available	100%	1	Soluble: Liquid ammonia

## Section 10: Stability and Reactivity

	Stability	Conditions to Avoid	Incompatible 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		
Oxygen Stable at normal temperatures and pressure.		Stable at normal temperatures and pressure.	Combustible materials, halo carbons, metals, bases, reducing agents, amines, metal salts, oxidizing materials, alkaline earth and alkali metals		
Methane	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Halogens, oxidizing materials, combustible materials		
Nitrogen	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Metals, oxidizing materials		

	Hazardous Decomposition Products	Possibility of Hazardous Reactions
Hydrogen Sulfide	Oxides of sulfur	Will not polymerize.
Oxygen	Miscellaneous decomposition products	Will not polymerize.
Methane	Oxides of carbon	Will not polymerize.
Nitrogen	Oxides of nitrogen	Will not polymerize.

# Section 11: Toxicology Information

**Acute Effects** 

	Oral LD50	Dermal LD50	Inhalation
Hydroge n 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
Oxygen	Not established		
Methan e	Not available         Not available         Nausea, vomiting, difficulty breathing headache, drowsiness, fatigue, dizzi mood swings, tingling sensation, loss		Nausea, vomiting, difficulty breathing, irregular heartbeat, headache, drowsiness, fatigue, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma
Nitroge n	Not available	Not available	Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma

	Eye Irritation	Skin Irritation	Sensitization
Hydro gen 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
Oxyge n	No information on significant adverse effects	No information on significant adverse effects	No significant target effects reported.
Metha ne	No information on significant adverse effects	No information on significant adverse effects	Difficulty breathing
Nitrog en	Contact with rapidly expanding gas may cause burns or frostbite	No information on significant adverse effects	Difficulty breathing

#### **Chronic Effects**

	Carcinogenicity	Mutagenicity	Reproductive Effects	Develo pmenta I Effects
Hydrog en Sulfide	Not available	Not available	Available.	No data
Oxygen	Not known.	Available.	Available.	No data
Methan e	Not available	Not available	Not available	No data
Nitroge n	Not hazardous	Not available	Not available	No data

# Section 12: Ecological Information

#### **Fate and Transport**

	Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
Hydro gen Sulfid e	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 Invertibrate 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
Oxyg en	Fish toxicity: Not available Invertibrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Low bioaccumulation	Not available
Meth ane	Fish toxicity: Not available Invertibrate toxicity:	Relatively non-persistent in the environment. Moderately volatile from water.	Accumulates very little in the bodies of living organisms.	Not expected to leach through the soil or the sediment.

	Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available			
Nitro gen	Fish toxicity: Not available Invertibrate 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

Hydrogen Sulfide	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): U135.
Oxygen	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Methane	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Nitrogen	Dispose in accordance with all applicable regulations.

# Section 14: Transportation Information

### U.S. DOT 49 CFR 172.101

### **DOT Information For This Mixture**

Shipping Name	Compressed gas, n.o.s. (Nitrogen, Oxygen)			
UN Number	UN1956			
Hazard Class	2.2			
Hazard Information	Non-Flammable Gas			

### Individual Component Information

	Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requiremen ts	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Descriptio n
HydrogenSulfide	Hydrogen sulfide	UN1053	2.3	Not applicable	2.3; 2.1	Forbidden	Forbidden	Toxic- Inhalation Hazard Zone B

	Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requiremen ts	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Descriptio n
O x y g e n	Oxygen, compressed	UN1072	2.2	Not available	2.2; 5.1	75 kg or L	150 kg	N/A
M et h a n e	Methane, compressed	UN1971	2.1	Not applicable	2.1	Forbidden	150 kg	N/A
N it o g e n	Nitrogen, compressed	UN1066	2.2	Not applicable	2.2	75 kg or L	150 kg	N/A

### **Canadian Transportation of Dangerous Goods**

	Shipping Name	UN Number	Class	Packing Group / Risk Group
Hy dro gen Sul fide	HYDROGEN SULFIDE; or HYDROGEN SULPHIDE	UN1053	2.3; 2.1	Not applicable
Oxy gen	Oxygen, compressed	UN1072	2.2; 5.1	Not applicable
Met han e	Methane, compressed	UN1971	2.1	Not applicable
Nitr oge n	Nitrogen, compressed	UN1066	2.2	Not applicable

# Section 15: Regulatory Information

### **U.S. Regulations**

	CERCLA Sections	SARA 355.30	SARA 355.40	
Hydro gen Sulfide	100 LBS RQ	500 LBS TPQ	100 LBS RQ	
Oxyge n	Not regulated.	Not regulated.	Not regulated.	
Metha ne	Not regulated.	Not regulated.	Not regulated.	
Nitrog en	Not regulated.	Not regulated.	Not regulated.	

### SARA 370.21

	Acute	Chronic	Fire	Reactive	Sudden Release
Hydr ogen Sulfi de	Yes	No	Yes	No	Yes
Oxy gen	No	No	Yes	No	Yes
Met hane	Yes	No	Yes	No	Yes
Nitr	Yes	No	No	No	Yes

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### SARA 372.65

Hydrogen Sulfide	HYDROGEN SULFIDE: Administrative stay issued Aug. 22, 1994
Oxygen	Not regulated.
Methane	Not regulated.
Nitrogen	Not regulated.

**OSHA Process Safety** 

Hydrogen Sulfide	1500 LBS TQ
Oxygen	Not regulated.
Methane	Not regulated.
Nitrogen	Not regulated.

#### **State Regulations**

	CA Proposition 65
Hydrogen Sulfide	Not regulated.
Oxygen	Not regulated.
Methane	Not regulated.
Nitrogen	Not regulated.

#### **Canadian Regulations**

	WHMIS Classification
Hydrogen Sulfide	A, B1, D1A, D2B.
Oxygen	A,C
Methane	A, B1
Nitrogen	A

### National Inventory Status

	US Inventory (TSCA)	TSCA 12b Export Notification	Canada Inventory (DSL/NDSL)
Hydr ogen Sulfi de	Listed on inventory.	Not listed.	Listed on inventory.
Oxyg en	Listed on inventory.	Not listed.	Not determined.
Meth ane	Listed on inventory.	Not listed.	Listed on inventory.
Nitro gen	Listed on inventory.	Not listed.	Listed on inventory.

## Section 16: Other Information

	NFPA Rating
Hydrogen Sulfide	HEALTH=4 FIRE=4 REACTIVITY=0
Oxygen	HEALTH=0 FIRE=0 REACTIVITY=0 SPECIAL=OX
Methane	HEALTH=0 FIRE=4 REACTIVITY=0
Nitrogen	HEALTH=0 FIRE=0 REACTIVITY=0 SPECIAL=SA
5	HEALTHEU FIREEU REACTIVITYEU SPECIALESA

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