

## HYDROGEN SULFIDE

Hydrogen Sulfide ( $H_2S$ ) is a colorless, highly toxic, flammable gas found both in nature and also produced by many industrial processes. It smells like rotten eggs at low concentrations and is heavier than air, collecting in low-lying areas.  $H_2S$  is often found in oil and gas, sewers, manure pits, landfills, and pulp/paper mills.

### Health Hazards

According to OSHA, here are the key health effects based on exposure levels:

H <sub>2</sub> S Concentrations	Potential Health Effects
0.01 – 50 ppm	<ul style="list-style-type: none"> <li>– 0.01–1.5 ppm: Rotten egg odor detectable.</li> <li>– 2–5 ppm: Nausea, eye irritation, sore throat, headaches, bronchial constriction.</li> <li>– 20 ppm: Fatigue, dizziness, irritability, memory issues.</li> <li>– 50–100 ppm: Respiratory irritation, eye inflammation, digestive upset.</li> </ul>
100 – 300 ppm	<ul style="list-style-type: none"> <li>– 100 ppm: Loss of smell (olfactory fatigue), coughing, drowsiness, throat irritation.</li> <li>– 200–300 ppm: Severe eye and respiratory irritation, risk of pulmonary edema.</li> </ul>
300 – 700 ppm	<ul style="list-style-type: none"> <li>– 500–700 ppm: Collapse within minutes, eye damage, death within 30–60 minutes.</li> </ul>
700+ ppm	<ul style="list-style-type: none"> <li>– 700–1000 ppm: Immediate unconsciousness, respiratory failure, death within minutes.</li> <li>– 1000–2000 ppm: Nearly instant death.</li> </ul>

It is important to be familiar with the characteristics of hydrogen sulfide and the effects it can have on your health. Chronic and long-term exposure to  $H_2S$  can cause neurological issues, such as memory loss, poor attention span, and motor dysfunction. At exposures above OSHA limits, cardiovascular and respiratory problems can develop.

### Safe Work Practices

#### 1. Hazard Assessment and Monitoring:

- Identify potential sources, exposure levels, and what processes may produce  $H_2S$ .
- Utilize continuous monitoring, especially in confined spaces. Ensure air monitoring is conducted by qualified personnel using appropriate detection equipment. Personal  $H_2S$  monitors should be worn in the breathing zone. Regularly calibrate and maintain detection equipment per the manufacturer's guidelines.

#### 2. Engineering Controls:

- Install and maintain ventilation systems, including exhaust and general ventilation, to reduce  $H_2S$  concentrations.
- Ensure that ventilation systems are non-sparking, grounded, corrosion-resistant, and explosion-proof to prevent potential fire and explosion hazards.
- Enclose chemical processes or equipment to prevent  $H_2S$  leaks and exposure.

### 3. Administrative Controls:

- Provide H<sub>2</sub>S awareness and site-specific training to all employees and visitors who may be exposed, including refresher training, on hazards, detection, equipment use, safe work practices, emergency and rescue procedures.
- Develop and enforce procedures for handling, storing, and disposing of materials.
- Post clear and conspicuous warning signs in areas where H<sub>2</sub>S may be present.

### 4. Personal Protective Equipment (PPE):

- Provide appropriate respiratory protection, such as air-purifying respirators or SCBAs, depending on the concentration and potential hazards.
- Ensure workers use appropriate PPE, including eye protection, chemical-resistant clothing, and gloves, as needed.

### 5. Emergency Response:

- Establish and regularly practice emergency response plans, including evacuation procedures, emergency shutdown protocols, and rescue operations.
- Activate alarms and evacuate to designated safe areas per emergency procedures.

***H<sub>2</sub>S incidents often lead to multiple casualties, with rescuers being particularly vulnerable. NEVER attempt a rescue in an area that may contain hydrogen sulfide without using appropriate respiratory protection and without being trained to perform such a rescue.***

## GCSC RESOURCES

### SAFETY TRAINING

6:00am – 3:00pm    [csr@mygcsc.com](mailto:csr@mygcsc.com)

Course Code	Course
A08H2S	Hydrogen Sulfide (H <sub>2</sub> S)
A08CSE	Confined Space
A08RSP	Respiratory Protection

### OCCUPATIONAL HEALTH SERVICES

6:00am – 2:00pm    [ohs@mygcsc.com](mailto:ohs@mygcsc.com)

Course Code	Service
08RSPCLR	Medical Clearance OSHA Questionnaire
08RFTFF    08RFTHF 08RFTN95   08RFTSA	Fit Test
08PFT	Pulmonary Function Test

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