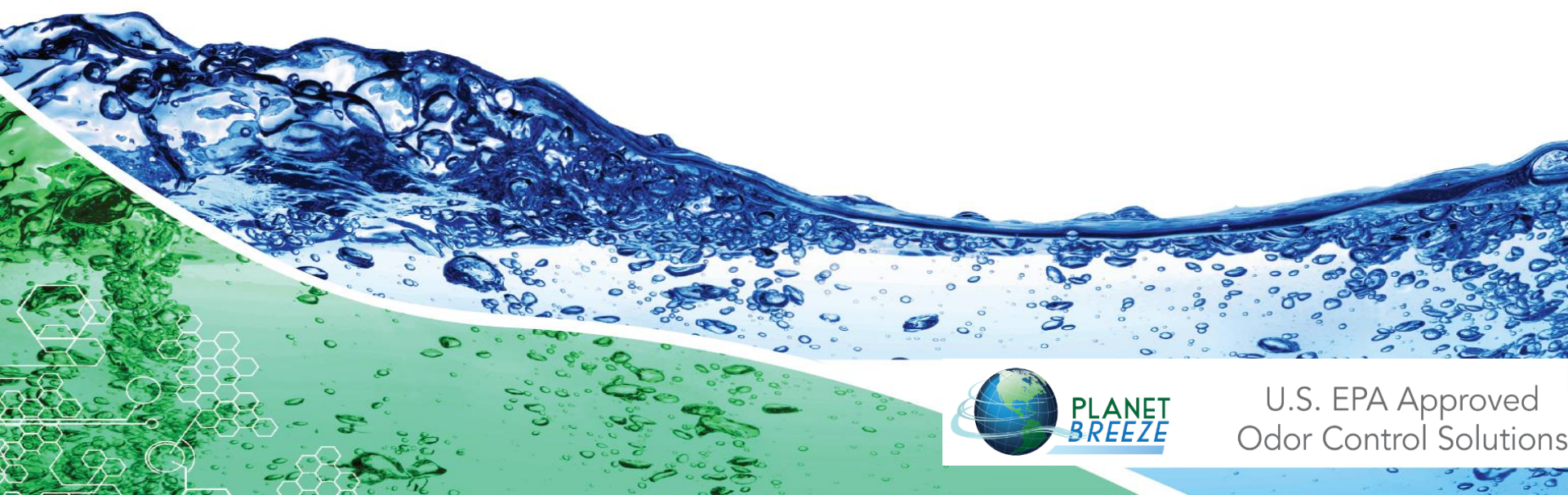




ACGIH ~ NIOSH ~ OSHA Standards for Hydrogen Sulfide



U.S. EPA Approved
Odor Control Solutions

Who Is OSHA

Occupational Safety and Health Administration

With the Occupational Safety and Health Act of 1970, Congress created the Occupational Safety and Health Administration (OSHA) to assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance. OSHA is part of the United States Department of Labor.

Who Is NIOSH

The Center for Disease Controls (CDC) - National Institute for Occupational Safety and Health

The Occupational Safety and Health Act of 1970 established NIOSH as a research agency focused on the study of worker safety and health, and empowering employers and workers to create safe and healthy workplaces. It has the mandate to assure “every man and woman in the Nation safe and healthful working conditions

Who Is ACGIH

Association Advancing Occupational and Environmental Health

ACGIH is dedicated to the advancement of occupational and environmental health and recognized as a worldwide premier scientific organization advancing occupational and environmental health. Works closely with OSHA and NIOSH

H₂S Limit Overview OSHA

H2S CAS Number : 7783-06-04

**Description of Substance: Colorless gas with a strong odor of rotten eggs
Immediately Dangerous to Life or Health Concentrations (IDLH)**

1989
OSHA Permissible Exposure Limit
(enforceable) (PEL):

10 ppm
(14 mg/m³) Time Weighted Average (TWA)
for a 8 Hour Day

15 ppm
(21 mg/m³) Short term Exposure Limit (STEL)

Current
OSHA Permissible Exposure Limit
(enforceable) (PEL):

20 ppm CEILING

50 ppm
10 Minute MAXIMUM PEAK

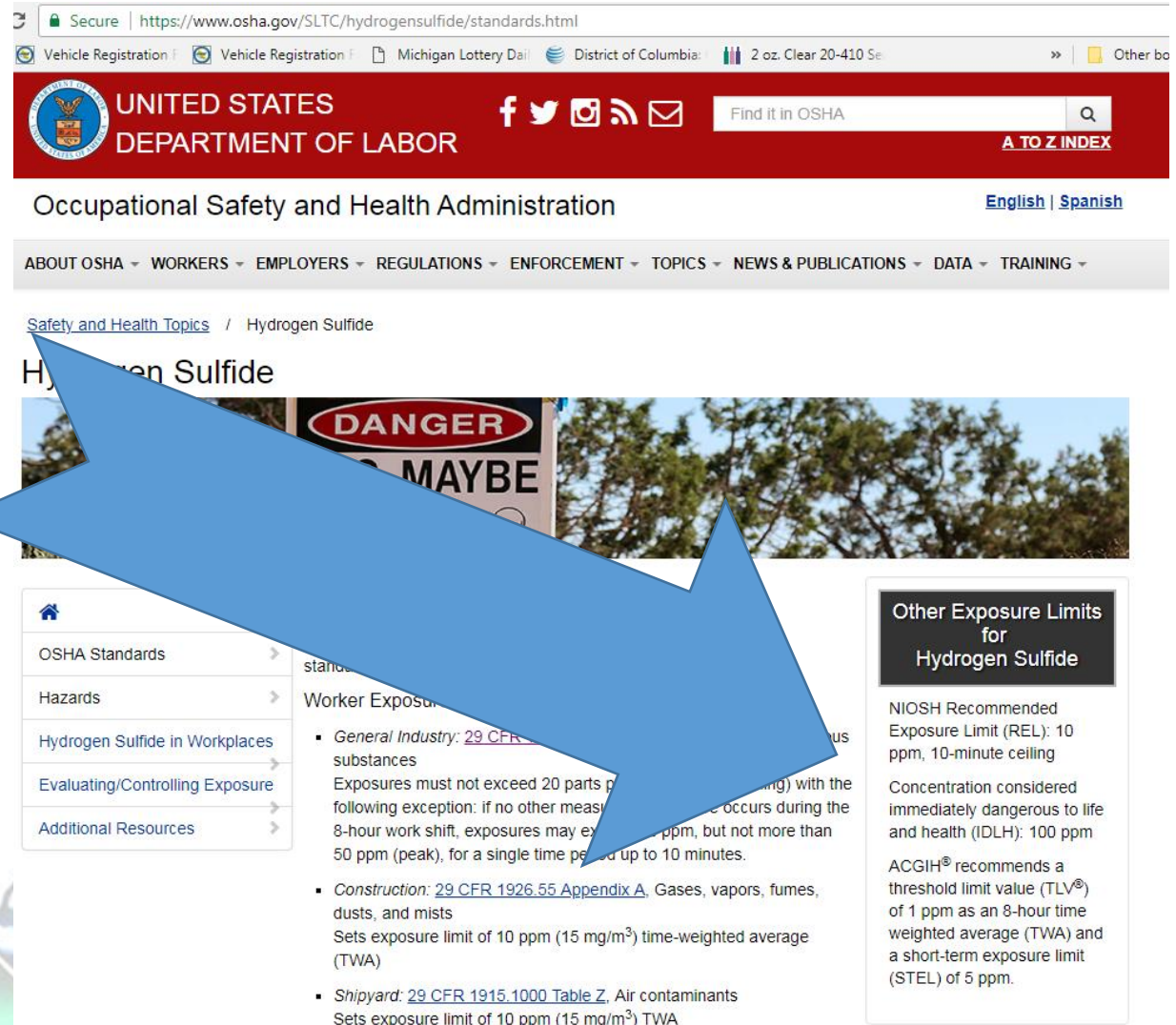
29 CFR 1910.1000 TABLE Z-2, Toxic and hazardous substances

Exposures **must not exceed** 20 parts per million (ppm) (ceiling) with the following exception: if no other measurable exposure occurs during the 8-hour work shift, exposures may exceed 20 ppm, but not more than 50 ppm (peak), for a single time period up to 10 minutes.

H₂S Limit Overview OSHA

Much of OSHA's Permissible Exposure Data is based on studies from the 1960's 70's and 80's

The current OSHA web site identifies additional exposure limits for Hydrogen Sulfide



The screenshot shows the OSHA website page for Hydrogen Sulfide standards. The page header includes the United States Department of Labor logo and navigation links. The main content area is titled "Hydrogen Sulfide" and features a large blue arrow pointing to the "Other Exposure Limits for Hydrogen Sulfide" section. The "Other Exposure Limits" section lists the following limits:

- NIOSH Recommended Exposure Limit (REL): 10 ppm, 10-minute ceiling
- Concentration considered immediately dangerous to life and health (IDLH): 100 ppm
- ACGIH® recommends a threshold limit value (TLV®) of 1 ppm as an 8-hour time weighted average (TWA) and a short-term exposure limit (STEL) of 5 ppm.

The main content area also includes a list of standards:

- General Industry: 29 CFR 1910.1000, Subpart Z - Toxic and Hazardous Substances. Exposures must not exceed 20 parts per million (ppm) (with the following exception: if no other measure occurs during the 8-hour work shift, exposures may exceed 20 ppm, but not more than 50 ppm (peak), for a single time period up to 10 minutes.
- Construction: 29 CFR 1926.55 Appendix A, Gases, vapors, fumes, dusts, and mists. Sets exposure limit of 10 ppm (15 mg/m³) time-weighted average (TWA)
- Shipyard: 29 CFR 1915.1000 Table Z, Air contaminants. Sets exposure limit of 10 ppm (15 mg/m³) TWA

Current
NIOSH Recommended Exposure Limit
(REL):

10 ppm (15mg/m³ CEILING)



H₂S Limit Overview ACGIH

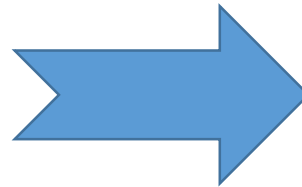
H₂S CAS Number : 7783-06-04

**Description of Substance: Colorless gas with a strong odor of rotten eggs
Immediately Dangerous to Life or Health Concentrations (IDLH)**

1993-1994
ACGIH Threshold Limit Value
(TLV):

10 ppm
(14 mg/m³) Time Weighted Average (TWA)

15 ppm
(21 mg/m³) Short term Exposure Limit (STEL)



Current
ACGIH Threshold Limit Value
(TLV):

1 ppm
Time Weighted Average (TWA)

5 ppm
Short term Exposure Limit (STEL)

LACK OF AWARENESS

Study conducted by the American Society of Engineers in November 2013 concluded that over 50% of industry safety experts were unaware of these new standards.

THESE ARE STATED ON THE OSHA WEB SITE

Other Exposure Limits for Hydrogen Sulfide

NIOSH Recommended
Exposure Limit (REL): 10
ppm, 10-minute ceiling

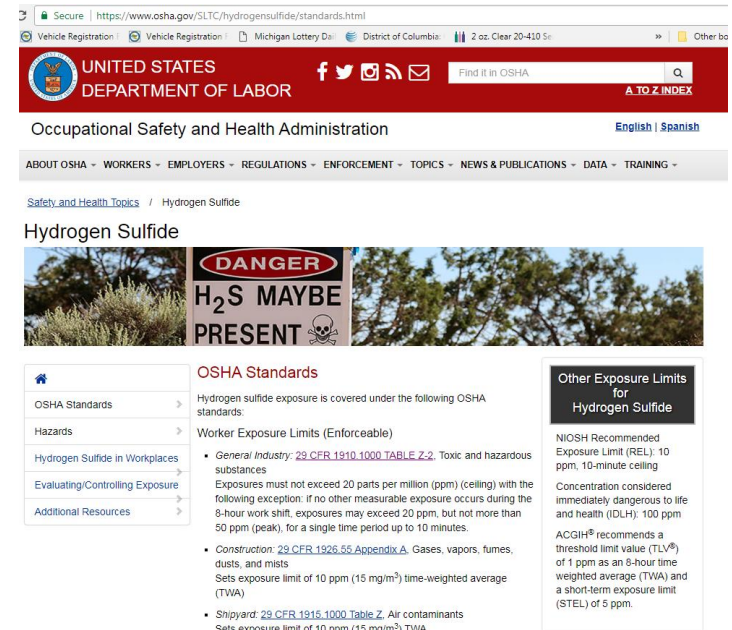
Concentration considered
immediately dangerous to life
and health (IDLH): 100 ppm

ACGIH® recommends a
threshold limit value (TLV®)
of 1 ppm as an 8-hour time
weighted average (TWA) and
a short-term exposure limit
(STEL) of 5 ppm.

Many organizations **are not** using the new TLV standard of 1ppm

They are typically measuring H₂S alarm levels at:

- 39% use 10ppm and 15ppm
- 35% use 5ppm and 10ppm
- 15% use 10ppm and 20 ppm



The screenshot shows the OSHA website page for Hydrogen Sulfide standards. The page header includes the United States Department of Labor logo and the text "Occupational Safety and Health Administration". The main content area is titled "Hydrogen Sulfide" and features a "DANGER H₂S MAYBE PRESENT" warning sign. Below the sign, there is a navigation menu with options like "OSHA Standards", "Hazards", and "Evaluating/Controlling Exposure". The main text under "OSHA Standards" states: "Hydrogen sulfide exposure is covered under the following OSHA standards: Worker Exposure Limits (Enforceable)". It lists three categories: "General Industry: 29_CFR_1910.1000 TABLE Z-2, Toxic and hazardous substances" (with a detailed exception for 8-hour shifts), "Construction: 29_CFR_1926.55 Appendix A, Gases, vapors, fumes, dusts, and mists" (with a 10 ppm TWA limit), and "Shipyard: 29_CFR_1915.1000 Table Z, Air contaminants" (with a 10 ppm TWA limit). On the right side, there is a section titled "Other Exposure Limits for Hydrogen Sulfide" which lists NIOSH Recommended Exposure Limit (REL) of 10 ppm, 10-minute ceiling, and ACGIH's TLV of 1 ppm as an 8-hour TWA and a short-term exposure limit (STEL) of 5 ppm.

Safety Must Always Be Our 1st Priority

Safety Hazards

Hydrogen sulfide is a highly flammable, explosive gas, and can cause possible life-threatening situations if not properly handled.

Hydrogen sulfide gas burns and produces other toxic vapors and gases, such as sulfur dioxide. In addition to exposure to hydrogen sulfide in the air, exposure to liquid hydrogen sulfide can cause "blue skin" or frostbite. If clothing becomes wet, avoid ignition sources, remove the clothing and isolate it in a safe area to allow it to evaporate.

The effect called knockdown (rapid unconsciousness) often results in falls that can seriously injure the worker

OSHA outlines potential longer term health effects

Some people who breathed in levels of **hydrogen sulfide** high enough to become unconscious continue to have headaches and poor attention span, memory, and motor function after waking up.

Problems with the cardiovascular system have also been reported at exposures above permissible exposure limits.

People who have asthma may be more sensitive to hydrogen sulfide exposure. That is, they may have difficulty breathing at levels lower than people without asthma.