RAE SYSTEMS by Honeywell

THE ABC'S OF GASES IN THE INDUSTRY

Ammonia: NH_3

Colorless gas with a pungent suffocating odor

STEL: 35 ppm
TWA: 50 ppm
IDLH: 300 ppm
LEL: 15% by volume
Ionization Potential: 10.18 eV

- Fertilizer Plants
- Fish & Meat Packing Plants
- Industrial Refrigeration and Cold Storage
- Semiconductor Industry
- Water and Wastewater Treatment Plants
- Munitions

Refer to AP-201 for further information

n-Butane*: C_4H_{10}

Colorless gas with a gasoline-like odor

STEL: 1 ppm
TWA: OSHA 5 ppm
LEL: 1.6% by volume

- Aerosol Propellant Filling Docks
- Feed stock for Chemical Processes
- Storage Tanks and Filling Docks

Benzene: C_6H_6

Colorless liquid with aromatic odor

STEL: 2.5 ppm
TWA: 0.5 ppm
LEL: 1.2%

- Refineries
- Oil & Gas Distribution
- Feed Stock for Chemical Production
- Solvent Distribution Centers
- Gas Stations

Carbon Dioxide: CO_2

Colorless, odorless gas

STEL: 30,000 ppm
TWA: OSHA 5000 ppm
IDLH: 40,000 ppm

- Breweries and Wineries
- Carbonated Beverage Bottling Plants
- Dry Ice Plants, Food Processing Plants, Fruit Storage and Ripening Chambers
- Greenhouses, Indoor Air Quality Studies, and Ventilation Control
- Mushroom Farms Stack Gas
- Oil Well Injection

Carbon Monoxide: CO	Chlorine: Cl_2
Colorless, odorless gas - most abundant toxic gas **STEL:** ppm **TWA:** OSHA 50 ppm **LEL:** 12.5% **IDLH:** 1200 ppm • Furnaces • Gasoline Generators/Engines • Grain Storage Silos • Lumber Drying Kilns • Mining and Metals • Parking Garages	**Green-yellow gas with a pungent, irritating odor** **STEL:** 0.3 ppm **TWA:** OSHA 0.1 ppm **IDLH:** 5 ppm • Mining & Metals Industry • Nuclear Reactors • Pulp & Paper Mills • PVC Plastics Manufacturing • Semiconductor Water Etching Facilities • Swimming Pool Chlorinization Plants • Water Treatment Plants • Chlorine Gas Manufacturing
n-Hexane*: C_6H_{14}	**Hydrogen*: H_2**
Colorless liquid with a gasoline-like odor **TWA:** OSHA 500 ppm **LEL:** 1.1% **IDLH:** 1100 ppm • Electric Generation • Gas Stations • Peanut Oil Extraction Plants • Solvent Distribution Centers	**Colorless gas** **No exposure limits – Simple asphyxiant** • Battery Charging Stations • Semiconductor Plants for Water Furnaces • Underground Vaults Containing Transformers • Vegetable Oil Hydrogenation Plants
Hydrogen Cyanide: HCN	**Hydrogen Sulfide: H_2S**
Colorless gas with a bitter, almond-like odor **TWA:** OSHA 10 ppm **LEL:** 5.6% **IDLH:** 50 ppm • Plating and Mining • Nylon Manufacturing	**Colorless gas with a strong odor of rotten eggs** **TWA:** OSHA 20 ppm **LEL:** 4.0% **IDLH:** 100 ppm • Leather Tanneries and Paper Mills • Mining and Metals Industry • Oil Fields and Refineries • Sewage Treatment Plants • Sewer Maintenance
Methane: CH_4	**Nitric Oxide: NO**
Colorless, odorless gas – odorized with mercaptans **Primary component of natural gas** **No exposure limits – Simple asphyxiant** **LEL:** 5% • Oil & Gas Distribution & Refining • Mining Industry	**Colorless gas** **TWA:** NIOSH/OSHA 25 ppm **IDLH:** 100 ppm • Semiconductor Plants • Mining

Nitrogen Dioxide: NO_2	Oxygen Deficiency: O_2
Reddish-brown with a pungent odor **STEL:** 1 ppm **TWA:** OSHA 5 ppm **IDLH:** 20 ppm • Boilers and Furnaces • Diesel Emissions • Semiconductor Plants • Mining Industry	**Colorless, odorless gas** • Cargo Holds and Storage Tanks • Grain Storage Silos With Inerted Atmospheres • Liquid Nitrogen Storage • LN2 Cooled Laser Facilities • LN2 Cooled Telescope • Sewer Maintenance • Sewer Treatment Facilities • Underground Vaults (Utilities)
Propane*: C_3H_8	**Sulfur Dioxide: SO_2**
Colorless, odorless gas **TWA:** OSHA 1000 ppm **LEL:** 2.1% **IDLH:** 2100 ppm (LEL) • Aerosol Propellant Filling Lines • Feed stock for various Chemical Processes • Propane-powered Forklifts • Storage Tanks & Filling Docks	**Colorless gas with a pungent odor** **STEL:** 5 ppm **TWA:** NIOSH 2 ppm **IDLH:** 100 ppm • Circuit Board Etching • Diesel Emissions • Paper Mills • Sulfur Processing Plants (SO_2) • Water Treatment
Volatile Organic Compounds (VOCs) **Refer to the NIOSH Pocket Guide for specific chemical hazards**	
• Airline Maintenance Facilities (Jet fuel - refer to AP-200) • Consultant Engineering • Leaking Underground Storage Tanks • Petrochemical Manufacturing • Aerospace Manufacturing • Automotive Manufacturing (paint booths–refer to AP-204) • High Tech Electronics Manufacturing • Pharmaceutical Manufacturing • Chemical Printed Circuit Board Fabrication Transportation (spills from tankers, cars) • Printing (lithography and flexography) • Fiberglass reinforced plastics (refer to AP-205) • Hazardous Waste Facilities	• Coating (cans, coils, and fabrics) • Forest products • Component manufacturing (parts spray-painting, resin components, adhesive components, misc. metalworking) • Regulatory agencies (OSHA, EPA, DOT) • Military (base closures) • Marine Chemists (ships and barges) • Emergency Response/HazMat teams (refer to AP-203) • Fire Departments: Arson Investigation • TSD (Treatment, Storage & Disposal) • Municipal/Public Works • Federal, State and Municipalities • Coke oven off gases (refer to AP-206)

**Denotes Combustible Gas*