

The ABC's Of Gases In The Industry

<p>Ammonia: NH₃ 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</p> <ul style="list-style-type: none"> • Fertilizer Plants • Fish & Meat Packing Plants • Industrial Refrigeration and Cold Storage • Semiconductor Industry • Water and Wastewater Treatment Plants • Munitions <p>Refer to AP-201 for further information</p>	<p>n-Butane*: C₄H₁₀ Colorless gas with a gasoline-like odor STEL: 1 ppm TWA: OSHA 5 ppm LEL: 1.6% by volume</p> <ul style="list-style-type: none"> • Aerosol Propellant Filling Docks • Feed stock for Chemical Processes • Storage Tanks and Filling Docks
<p>Benzene: C₆H₆ Colorless liquid with aromatic odor STEL: 2.5 ppm TWA: 0.5 ppm LEL: 1.2%</p> <ul style="list-style-type: none"> • Refineries • Oil & Gas Distribution • Feed Stock for Chemical Production • Solvent Distribution Centers • Gas Stations 	<p>Carbon Dioxide: CO₂ Colorless, odorless gas STEL: 30,000 ppm TWA: OSHA 5000 ppm IDLH: 40,000 ppm</p> <ul style="list-style-type: none"> • 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
<p>Carbon Monoxide: CO Colorless, odorless gas - most abundant toxic gas STEL: ppm TWA: OSHA 50 ppm LEL: 12.5% IDLH: 1200 ppm</p> <ul style="list-style-type: none"> • Furnaces • Gasoline Generators/Engines • Grain Storage Silos • Lumber Drying Kilns • Mining and Metals • Parking Garages 	<p>Chlorine: Cl₂ Green-yellow gas with a pungent, irritating odor STEL: 0.3 ppm TWA: OSHA 0.1 ppm IDLH: 5 ppm</p> <ul style="list-style-type: none"> • 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

<p>n-Hexane*: C₆H₁₄ Colorless liquid with a gasoline-like odor TWA: OSHA 500 ppm LEL: 1.1% IDLH: 1100 ppm</p> <ul style="list-style-type: none"> • Electric Generation • Gas Stations • Peanut Oil Extraction Plants • Solvent Distribution Centers 	<p>Hydrogen*: H₂ Colorless gas No exposure limits – Simple asphyxiant</p> <ul style="list-style-type: none"> • Battery Charging Stations • Semiconductor Plants for Water Furnaces • Underground Vaults Containing Transformers • Vegetable Oil Hydrogenation Plants
<p>Hydrogen Cyanide: HCN Colorless gas with a bitter, almond-like odor TWA: OSHA 10 ppm LEL: 5.6% IDLH: 50 ppm</p> <ul style="list-style-type: none"> • Plating and Mining • Nylon Manufacturing 	<p>Hydrogen Sulfide: H₂S Colorless gas with a strong odor of rotten eggs TWA: OSHA 20 ppm LEL: 4.0% IDLH: 100 ppm</p> <ul style="list-style-type: none"> • Leather Tanneries and Paper Mills • Mining and Metals Industry • Oil Fields and Refineries • Sewage Treatment Plants • Sewer Maintenance
<p>Methane: CH₄ Colorless, odorless gas – odorized with mercaptans Primary component of natural gas No exposure limits – Simple asphyxiant LEL: 5%</p> <ul style="list-style-type: none"> • Oil & Gas Distribution & Refining • Mining Industry 	<p>Nitric Oxide: NO Colorless gas TWA: NIOSH/OSHA 25 ppm IDLH: 100 ppm</p> <ul style="list-style-type: none"> • Semiconductor Plants • Mining
<p>Nitrogen Dioxide: NO₂ Reddish-brown with a pungent odor STEL: 1 ppm TWA: OSHA 5 ppm IDLH: 20 ppm</p> <ul style="list-style-type: none"> • Boilers and Furnaces • Diesel Emissions • Semiconductor Plants • Mining Industry 	<p>Oxygen Deficiency: O₂ Colorless, odorless gas</p> <ul style="list-style-type: none"> • 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)

<p>Propane*: C₃H₈ Colorless, odorless gas TWA: OSHA 1000 ppm LEL: 2.1% IDLH: 2100 ppm (LEL)</p> <ul style="list-style-type: none"> • Aerosol Propellant Filling Lines • Feed stock for various Chemical Processes • Propane-powered Forklifts • Storage Tanks & Filling Docks 	<p>Sulfur Dioxide: SO₂ Colorless gas with a pungent odor STEL: 5 ppm TWA: NIOSH 2 ppm IDLH: 100 ppm</p> <ul style="list-style-type: none"> • Circuit Board Etching • Diesel Emissions • Paper Mills • Sulfur Processing Plants (SO₂) • Water Treatment
<p>Volatile Organic Compounds (VOCs) Refer to the NIOSH Pocket Guide for specific chemical hazards</p>	
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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*