

Risks and Safety Hazards of Ammonia

What is Ammonia?

Chemical Compound: NH₃

CAS Number: 7664-41-7

Ammonia is a naturally occurring and manufactured inorganic compound.

Other names: Anhydrous ammonia, Liquid ammonia, Nitro-Sil, AM-Fol

Chemical Forms



Chemical Properties

Molecular weight: 17.03
Boiling point: -33.35°C
Melting point: -77.7°C
Vapour pressure: 10 bar (at 25.7°C)

Gas Colour: colourless
Gas Density (Air): 2.994 kg/m³

Safety Hazards of Ammonia



Ammonia occurs naturally in the environment and is a commonly used industrial chemical. Applications of its use range from manufacturing (production of plastics, fibres, and other chemicals), agriculture (as a fertiliser), and consumer-related (food additive, cleaning agent, or refrigerant).

Risk of exposure can occur through;

- Accidental Release
- Leak
- Transportation



Ammonia is generally regarded as non-flammable. However, in high concentrations and certain atmospheric conditions, it is a fire and explosion hazard. Fire will produce irritating, corrosive, and toxic gases.

It can also decompose at high temperatures forming hydrogen gas.

Health Risk: Ammonia Exposure Effects

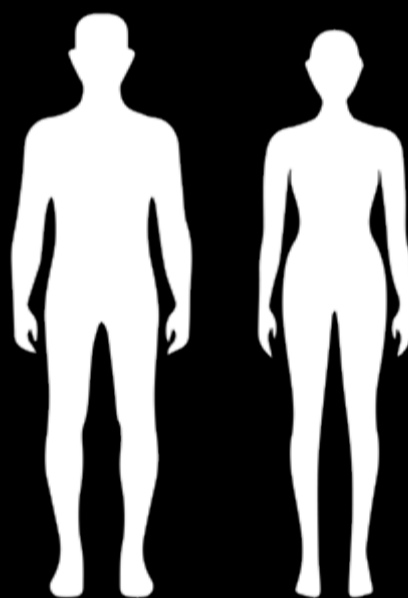


EYES

- Burning
- Freezing
- Blindness

CHRONIC EXPOSURE

Long-term damage may result from severe short-term exposure.



RESPIRATORY SYSTEM

- Tightness
- Difficulty breathing
- Fluid in lungs
- Burning



SKIN

- Corrosive
- Frostbite
- Burning

Working Exposure Limits of Ammonia

The eight-hour Time-Weighted Average (TWA) recommendations of Safe Work Australia:

25ppm

TWA concentration can result in irritation to workers.

Occupational Exposure Standards

	Excursion Limit
8 hr TWA	25 ppm (17 mg/m ³)
15 min STEL	35 ppm (24 mg/m ³)
PEAK	no data available
Acute toxicity: Oral LD50 (rat)	350 mg/kg
Acute Toxicity: Inhalation LC50 (rat)	2000 ppm/4hr
Acute Toxicity: Inhalation LD50 (rat)	7,338 – 11,590 ppm at 1 hour

Dangers of Chemical Plumes

How long for ammonia gas to dissipate? The duration and behaviour of a chemical plume are dependent on many factors. These include the volume released, ambient temperature, time of day, relative humidity, wind direction and speed, terrain, natural and urban barriers and environmental absorption factors such as dense and sparse foliage.

When liquid anhydrous ammonia is released into the air from its pressurised container it expands rapidly. A large vapour cloud will form travelling close to the ground. As the chemical plume behaves as if it is heavier-than-air, the risk of exposure to humans is greater compared to some other gases.