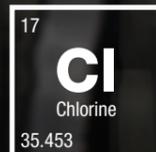


# Risks and Safety Hazards of Chlorine Gas

## What is Chlorine?

Chemical Compound: Cl<sub>2</sub>

CAS Number: 7782-50-5



Chlorine is a naturally occurring chemical element, although due to its reactive nature, it is rarely found in its natural form.

*Other names: Molecular chlorine, dichlorine, chlorinated water, bertholite, Javelle water, and sodium hypochlorite*

### Chemical Forms



### Chemical Properties

**Molecular weight:** 70.91  
**Specific gravity:** 1.56 (LIQUID, -34.6°C)  
**Boiling point:** -34.6°C  
**Melting point:** -101°C  
**Vapour pressure:** 4800 mmHg (at 20°C)  
**Gas Colour:** yellow-green  
**Gas Density (Air):** 2.994 kg/m<sup>3</sup>

## Safety Hazards of Chlorine Gas



Chlorine's ability to combine with other elements and compounds is commonly used in a wide range of applications from manufacturing (plastics), industrial (sewage), domestically (swimming pools) and healthcare (pharmaceuticals).

Risk of exposure can occur through;

- Accidental Release
- Leak
- Transportation



Chlorine is a non-combustible gas at atmospheric pressure. However, it will react explosively with other many compounds, primarily hydrocarbons, alcohols and ethers. These include acetylene, ether, fluorine, turpentine, hydrogen, ammonia, sodium hydroxide and potassium hydroxide.

It is also a strong oxidising agent which can cause it to ignite organic materials such as wood, paper and oil.

## Health Risk: Chlorine Exposure Effects



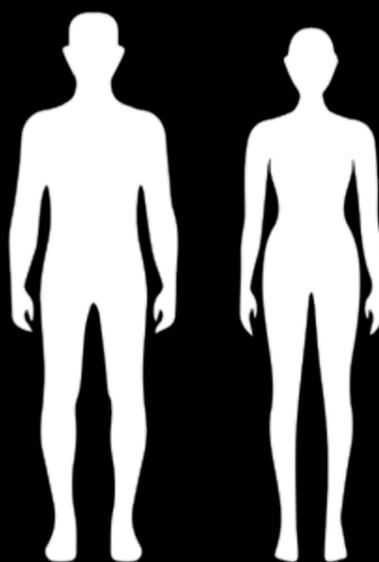
### EYES

- Blurred vision
- Burning



### DIGESTIVE SYSTEM

- Nausea
- Vomiting



### RESPIRATORY SYSTEM

- Coughing
- Difficulty breathing
- Fluid in lungs
- Burning



### SKIN

- Irritation: blistering, redness, frostbite

## Working Exposure Limits of Chlorine

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

**0.5ppm**

TWA concentration will result in markedly less irritation.

**1.0ppm**

TWA concentration can result in irritation to workers.

### Global Exposure Standard Examples

Safety Guidelines	8 hour TWA (ppm)	Excursion Limit (ppm)
ACGIH '90	0.5	1 (STEL -15 min)
NIOSH (US) '76	-	0.5 (15 min)
Sweden '84	0.5	1 (15 min)
West Germany '88	0.5	1 (Type I)
HSE(UK) '89	1*	3* (STEL - 10 min)
Netherlands '86	1	2 (15 min)

\* Under review by HSE

## Dangers of Chemical Plumes

**How long for chlorine 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.