

Application Note

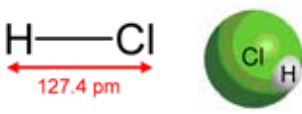
Hydrogen Chloride

Potential industries and applications for gas detection products

- Hydrogen Chloride production
- Chemical manufacturing
- Rubber treatment
- Metal treatment plants
- Cotton treatment
- Semiconductor manufacturing

The compound Hydrogen Chloride has the formula HCl. At room temperature, it is a colourless gas, which forms white fumes of Hydrochloric Acid upon contact with atmospheric humidity. Hydrogen Chloride gas, as well as Hydrochloric Acid, are important in technology and industry. The formula HCl is often used to refer, somewhat misleadingly, to Hydrochloric Acid, an aqueous solution derived from Hydrogen Chloride.

Hydrogen Chloride forms corrosive Hydrochloric Acid on contact with water found in body tissue. Inhalation of the fumes can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory system failure, and death. Skin contact can cause redness, pain, and severe skin burns. Hydrogen Chloride may cause severe burns to the eye and permanent eye damage.

Hydrogen Chloride			
			
General			
Systematic Name	Hydrogen Chloride Chlorane		
Other Names	Chlorohydric Acid Hydrochloride Hydrochloric Acid Hydrochloric Acid gas		
Molecular Formula	HCl		
Appearance	Colourless gas, hygroscopic		
CAS Number	7647-01-0		
Properties			
Vapour Density	1.3		
Melting Point	-114.2°C (158.8K)		
Boiling Point	-85.1°C (187.9K)		
Toxic Exposure Levels			
EH 40 Workplace Exposure Limit (WEL)			
Long-term exposure limit (8-hour TWA reference period)		Short-term exposure limit (15-minute TWA reference period)	
ppm	mg.m⁻³	ppm	mg.m⁻³
1	2	5	8
OSHA Permissible Exposure Limit (PEL)			
Long-term exposure limit (8-hour TWA reference period)			
ppm	mg.m-3		
5 (ceiling)	7 (ceiling)		
ACGIH Threshold Limit Value			
8-hour TWA workday and a 40-hour workweek		2ppm (ceiling)	

Industrial Applications

Historical uses of Hydrogen Chloride in the 20th century include hydrochlorinations of alkynes in producing the chlorinated monomers Chloroprene and Vinyl Chloride, which are subsequently polymerised to make Polychloroprene (Neoprene) and Polyvinyl Chloride (PVC), respectively. In the production of Vinyl Chloride, Acetylene (C₂H₂) is Hydrochlorinated by adding the HCl across the triple bond of the C₂H₂ molecule, turning the triple into a double bond, yielding Vinyl Chloride.

- Most Hydrogen Chloride is used in the production of Hydrochloric Acid.
- Hydrochlorination of rubber
- Production of Vinyl and Alkyl Chlorides
- Chemical intermediate in other chemical production
- Use as babbiting flux
- Treatment of cotton (delinting and separation from wool)
- Used in semiconductor industry (in pure grade)
 - Etching semiconductor crystals
 - Converting Silicon to SiHCl₃ for purification of Silicon

Hydrogen Chloride usually comes in compressed gas cylinders that are either red and brown or grey with a yellow band.

Honeywell Analytics' product offering



Our Product Range



Fixed Gas Monitoring

Honeywell Analytics offers a wide range of fixed gas detection solutions for a diverse array of industries and applications including: Commercial properties, industrial applications, semiconductor manufacturers, energy plants and petrochemical sites.

- » Detection of flammable, oxygen and toxic gases (including exotics)
- » Innovative use of 4 core sensing technologies – paper tape, electrochemical cell, catalytic bead and infrared
- » Capability to detect down to Parts Per Billion (ppb) or Percent by Volume (%v/v)
- » Cost effective regulatory compliance solutions

Portable Gas Monitoring

When it comes to personal protection from gas hazards, Honeywell Analytics has a wide range of reliable solutions ideally suited for use in confined or enclosed spaces.

These include:

- » Detection of flammable, oxygen and toxic gases
- » Single gas personal monitors – worn by the individual
- » Multi-gas portable gas monitors – used for confined space entry and regulatory compliance
- » Multi-gas transportable monitors – used for temporary protection of area during site construction and maintenance activities

Technical Services

At Honeywell Analytics, we believe in the value of great service and customer care. Our key commitment is providing complete and total customer satisfaction. Here are just a few of the services we can offer:

- » Full technical support
- » Expert team on hand to answer questions and queries
- » Fully equipped workshops to ensure quick turnaround on repairs
- » Comprehensive service engineer network
- » Training on product use and maintenance
- » Mobile calibration service
- » Customised programmes of preventative/corrective maintenance
- » Extended warranties on products

Find out more

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