

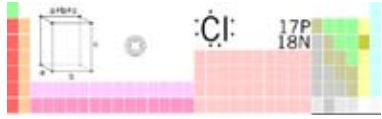
# Application Note

## Chlorine

### Potential industries and applications for gas detection products

- Water and wastewater treatment
- Swimming pools
- Chemical plants
- Industrial manufacturing plants
- Pharmaceutical manufacturing

Chlorine is the chemical element with atomic number 17 and symbol Cl. In its common elemental form (Cl<sub>2</sub> or “Dichlorine”) under standard conditions, it is a pale green gas about 2.5 times as dense as air. It has a disagreeable, suffocating odour that is detectable in concentrations as low as 3.5ppm and is poisonous. Chlorine is a powerful oxidant and is used in bleaching and disinfectants. As a common disinfectant, it is used in swimming pools to keep them clean. In the upper atmosphere, Chlorine atoms have been implicated in destruction of the Ozone layer.

Chlorine			
			
General			
Systematic Name	Chlorine		
Molecular Formula	Cl <sub>2</sub>		
Appearance	Yellowish green gas		
CAS Number	7782-50-5		
Properties			
Vapour Density	2.5		
Melting Point	-101.5°C (171.6K, 150.7°F)		
Boiling Point	-34.04°C (239.11K, 29.27°F)		
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 <sup>-3</sup>	ppm	mg.m <sup>-3</sup>
0.5	1.5	1	2.9
OSHA Permissible Exposure Limit (PEL)			
Long-term exposure limit (8-hour TWA reference period)			
ppm	mg.m <sup>-3</sup>		
1 (ceiling)	2.9 (ceiling)		
ACGIH Threshold Limit Value			
8-hour TWA workday and a 40-hour workweek		0.5ppm	

### Industrial Applications

Chlorine’s principal applications are in the production of a wide range of industrial and consumer products. For example, it is used in making plastics, solvents for dry cleaning and metal degreasing, textiles, agrochemicals and pharmaceuticals, insecticides, dyestuffs, etc.

Chlorine is an important chemical for water purification, in disinfectants, and in bleach. It is used (in the form of hypochlorous acid) to kill bacteria and other microbes in drinking water supplies and public swimming pools. However, in most private swimming pools Chlorine itself is not used, but rather Sodium Hypochlorite (household bleach), formed from Chlorine and Sodium Hydroxide, or solid tablets of Chlorinated Isocyanurates. Even small water supplies are now routinely chlorinated.

Chlorine is used extensively in organic and inorganic chemistry as an oxidising agent and in substitution reactions because Chlorine often imparts many desired properties to an organic compound, due to its electronegativity.

Chlorine compounds are used as intermediates in the production of a number of important commercial products that do not contain Chlorine. Examples are: Polycarbonates, Polyurethanes, Silicones, Polytetrafluoroethylene, Carboxymethyl Cellulose and Propylene Oxide.

Chlorine is used in the manufacture of numerous organic Chlorine compounds, the most significant of which in terms of production volume are 1,2-Dichloroethane and Vinyl Chloride, intermediates in the production of PVC. Other particularly important organochlorines are Methyl Chloride, Methylene Chloride, Chloroform, Vinylidene Chloride, Trichloroethylene, Perchloroethylene, Allyl Chloride, Epichlorohydrin, Chlorobenzene, Dichlorobenzenes and Trichlorobenzenes. Chlorine is also used in the production of Chlorates and in Bromine extraction.

### Honeywell Analytic's 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

[www.honeywellanalytics.com](http://www.honeywellanalytics.com)

### Contact Honeywell Analytics:

#### Europe, Middle East, Africa

Life Safety Distribution AG  
Wilstrasse 11-U31  
CH-8610 Uster  
Switzerland  
Tel: +41 (0)44 943 4300  
Fax: +41 (0)44 943 4398  
[gasdetection@honeywell.com](mailto:gasdetection@honeywell.com)

#### Americas

Honeywell Analytics Inc.  
405 Barclay Blvd.  
Lincolnshire, IL 60069  
USA  
Tel: +1 847 955 8200  
Toll free: +1 800 538 0363  
Fax: +1 847 955 8208  
[detectgas@honeywell.com](mailto:detectgas@honeywell.com)

#### Asia Pacific

Honeywell Analytics Asia Pacific  
#508, Kolon Science Valley (1)  
187-10 Guro-Dong, Guro-Gu  
Seoul, 152-050,  
Korea  
Tel: +82 (0)2 2025 0307  
Fax: +82 (0)2 2025 0329  
[analytics.ap@honeywell.com](mailto:analytics.ap@honeywell.com)

### Technical Services

[ha.emea.service@honeywell.com](mailto:ha.emea.service@honeywell.com)

[www.honeywell.com](http://www.honeywell.com)

#### Please Note:

While every effort has been made to ensure accuracy in this publication, no responsibility can be accepted for errors or omissions. Data may change, as well as legislation, and you are strongly advised to obtain copies of the most recently issued regulations, standards, and guidelines. This publication is not intended to form the basis of a contract.

H\_Chlorine\_GasAppNote\_V1\_EMEA

12/07

© 2007 Honeywell Analytics

# Honeywell