

PRODUCT PROFILE

CHLORINE



DESCRIPTION

In its elemental form, chlorine is a greenish yellow gas with an unmistakable irritating, penetrating and pungent odor. It is very unstable and highly reactive which can quickly react with other substances to form other chemicals. Chlorine gas or liquid is neither explosive nor flammable.

Chlorine can be readily compressed into clear, amber-colored liquid which solidifies at atmospheric pressure at about -150°F. Chlorine gas forms into a soft ice upon contact with moisture at 49.3°F and at atmospheric pressure. The liquid is about two and a half times heavier than air. The liquid vaporizes readily at normal atmospheric temperature and pressure.

USES

Chlorine is used in thousands of commercial compounds used directly or indirectly in applications, 98% of the U.S. drinking water systems, 85% of pharmaceuticals and 96% of crop-protection chemicals. They are also widely used in plastics, disinfectants, paper manufacturing, bleach, wastewater treatment, food processing and many other industrial processes and chemicals.

PROPERTIES OF CHLORINE GAS

Symbol.....	Cl ₂
Atomic Number.....	17
Atomic Wt.....	35.457
Isotopes.....	33, 34, 35, 36, 37, 38, 39
Density at 32°F ant 1 atm.....	0.2006 lb/ft ³
Liquefying point at 1 atm.....	-30.1°F (-34.5°C)
Viscosity at 68°F.....	0.01325 centipoise (approximately the same as saturated steam between 1 and 10 atm)
Specific Heat at constant volume at 1 atm pressure and 59°F.....	0.085 Btu/lb/°F
Thermal Conductivity at 32°F.....	0.0042Btu/lb/ft ² /°F/ft
Heat of reaction with NaOH.....	626 Btu/lb Cl ₂ gas
Solubility in water at 68°F.....	60.84 lbs/1000 gal

PROPERTIES OF LIQUID CHLORINE

Critical Temperature.....	291.2°F 9 (144°C)
Critical Pressure.....	1118.36 psia
Critical Density.....	573 g/l; 35.77 lbs/ft ³
Compressibility.....	0.0118% per unit vol per atm increase at 68°F
Density	at 32°F 91.67 lbs/ft ³
Specific Gravity.....	at 68°F 1.41 (water = 1)



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Boiling Point (Liquefaction Point).....	1 atm – 34.5°C; - 149.76°F
Viscosity.....	at 68°F 0.342 centipoise
1 Volume liquid at 32°F and 1 atm.....	248.6 vol gas
1 lb liquid at 32°F and 1 atm.....	4.98 ft3 gas
Specific Heat.....	0.226 Btu/lb/°F
Latent Heat of Vaporization.....	123.8 Btu/lb at -29.3°F
Heat of Fusion.....	41.2 Btu/lb at -150.7°F

HANDLING

Chlorine is packaged and stored as a liquefied gas under pressure in steel containers. These containers must be handled with care and can be stored indoors or outdoors. Chlorine containers should be stored in cool places away from any heat sources. The loading density of any container is limited by regulations to allow for about 12% gas space. The weight may not exceed 125% of the weight of water at 60°F that the container holds.

Dry chlorine does not corrode steel or other common metals. In the presence of moisture it is highly corrosive. It is imperative that precautions are taken to keep the chlorine and chlorine equipment free from moisture. Pipe lines, valves, and cylinders should be tightly closed when not in use or empty, since they will usually contain chlorine vapors that will quickly react with moisture from the air.

SAFETY

Chlorine is stored in pressure vessels and should only be handled by highly specialized and trained operators. Liquid chlorine is a skin irritant, and can cause severe damage, resembling a burn. Chlorine gas is slightly soluble in water. Water should never be sprayed directly on a chlorine gas leak or liquid spill. The reaction of chlorine and water will form acids and the leak will get worse.

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