

# Typical Gas Chlorination Dosage Rates



## Disinfection Products

### Water

Reason for Chlorination	Typical Dosage ppm (mg/l)	Contact time (minutes)	Residual Type
Disinfection of potable water: Surface Well	1-10 1-5	As required As required	As required As required
Control of: Taste and odor Algae Slime Iron & Bacteria	1-3 3-5 3-5 1-10	20 Varies Maintain residual throughout system	Free Free Free free
Ammonia (Break point)	10 times NH <sub>3</sub> content	Minutes	Free
Removal of: Iron Manganese Color  Hydrogen Sulfide: To Sulfur To Sulfate	0.64 times Fe content 1.3 times Mn content Dependent on type and extent of color removal desired  2 times H <sub>2</sub> S content 8 times H <sub>2</sub> S content	Instantaneous Varies 15 Instantaneous	Free Free Free
Food processing: Water, washdown Water, chilling	50 20	Varies Varies	Free Free
Treatment of water: Swimming pool Cooling	1-5 3-5		

### Wastewater

Reason for Chlorination	Typical Dosage ppm (mg/l)
Disinfection of: Raw sewage Primary disinfection Trickling filter effluent Activated sludge effluent Sand filter effluent	15-20 10-15 3-8 3-8 2-5
Odor control of: Upper sewer Plant influent Trickling filter effluent	1-10 1-10 1-5
B.O.D. reduction: Raw screened sewage Activated sludge effluent	10 10
Cyanide destruction: To cyanate Complete destruction	2.7 times cyanide content 7.3 times cyanide content

\* The rates in PPM or mg/l given are for average conditions. Consult Capital Controls for special applications.

**CALCULATING CHLORINATOR SIZE** - Chlorinator sizes should be based upon the maximum expected flow rate at any time. Use gallons per minute (GPM) or cubic meters per hour (m<sup>3</sup>/h) rather than daily total or average.

U.S. - PPD = GPM x .012 x Dosage (ppm)

Metric - g/h = m<sup>3</sup>/h (water) x Dosage (mg/l)

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## Definition of Terms

Many factors determine the exact amount of chlorine to be fed in a given application to obtain the desired results. Gas chlorinators operate over a wide range of flow rates and usually can be converted to higher or lower rates very easily. The maximum flow rate of a gas chlorinator is at least 20 times its minimum rate with any given capacity metering tube. As an aid to readers who may be unfamiliar with some of the basic terms used in chlorination, and in water and wastes treatment, the following definitions might be helpful.

**Dosage** - Amount of chlorine applied to water or wastewater expressed in parts per million (PPM) or milligrams per liter (mg/l).

**Effluent** - Liquid discharge of a treatment plant or of a piece of equipment or tank within a plant.

**B.O.D.** - Biochemical Oxygen Demand: The required amount of oxygen necessary for the chemical and biological oxidation of waterborne substances in a specific time, under specific conditions.

**PPD or g/h** - Pounds Per Day, referring to the pounds of chlorine per day or Grams Per Hour, referring to the grams of chlorine per hour gas feed rate.

**ppm or mg/l** - Parts Per Million - pounds of chlorine per million pounds of water; or Milligrams of chlorine per liter of water. ppm and mg/l are numerically identical measurements.

**Chlorine Residual** - The amount of chlorine remaining after a specified contact period. The amount in excess of demand. It is necessary to maintain a chlorine residual level to assure complete and proper treatment. (The margin of insurance against subsequent contamination)

**Chlorine Demand** - Chlorine actually absorbed by the disinfection process. Difference between the amount added and the amount remaining at the end of a specified contact period. (Chlorine demand = chlorine dosage - chlorine residual).

**Free Available Residual Chlorine** - That portion of the total chlorine residual which will react chemically and biologically as hypochlorous acid (HOCl) or hypochlorite ion (OCl<sup>-</sup>).

**Combined Residual Chlorine** - That portion of the total chlorine residual which will react chemically and biologically as chloramines (NHCl, NHCl<sub>2</sub>, NCl<sub>3</sub>) or organic chloramines.

**Back Pressure** - The line pressure in a pipe into which chlorine is to be injected, plus the pressure drop in the solution line from the ejector to the point of application.

Design improvements may be made without notice.

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