REGAL SYSTEMS
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TECHNICAL BULLETIN

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SIZING GUIDE FOR REGAL GAS CHLORINATORS

The basic formulas for determining the proper gas chlorinator size is based on the maximum expected flow rate of water or wastewater at any time and are as follows:

lbs./day chlorine - (0.012) X (flow rate in US gpm) X (dosage in ppm)
lbs./day chlorine - (0.015) X (flow rate in IMP. gpm) X (dosage in ppm)
gms./hr. chlorine - (3.6) X (flow rate in 1/s) X (dosage in mg/1).

EXAMPLE:

A deepwell treatment station is pumping drinking water at a maximum rate of 1000 gpm. Water quality is good with low chlorine demand and requires a chlorine dosage rate of 2 ppm to maintain required chlorine residual:

lbs./day = .012 X gpm X ppm
lbs./day = .012 X gpm X 2
lbs./day = 24

Allowing for an oversizing safety factor of at least twice the required dosage rate, a 50 PPD REGAL Gas Chlorinator is used.

ABBREVIATIONS

ppm - parts per million (by weight e.g. pounds per million pounds)

mg/1 - milligrams per liter (numerically equal to ppm)

gpm - gallons per minute

1/s - liters per second

PPD - pounds per day (chlorine feed rate)

gms./hr. - grams per hour (chlorine feed rate)

DEFINITION OF TERMS Used in chlorination of water and wastewater:

B.O.D.: Biochemical oxygen demand: oxygen required for the biological and chemical oxidation of substances contained in water or wastewater within a specific amount of time under specific conditions.

Demand: The amount of chlorine needed to satisfy reducing substances present such as organic matter, manganese, unoxidized iron, sulfides, etc.

Dosage: Amount of chlorine, expressed in ppm or mg/1, which must be injected into water or wastewater to satisfy the demand and maintain a required chlorine residual.

Residual: Chlorine remaining, after a specific contact time, which is still available for reaction. Essentially, this is the amount of chlorine in excess of the DEMAND.

Free Chlorine Residual: That portion of the total chlorine residual that remains in the water or wastewater, at the end of a specified contact period, which will react chemically and biologically as hypochlorous acid or hypochlorite ion.

Combined Chlorine Residual: The portion of total chlorine residual that remains in the water (or wastewater), at the end of a specific contact period, which will react chemically and biologically as chloramines. (Chloramine is the combination of chlorine and ammonia).

CHLORINE DOSAGE GUIDE

CHLORINATION TREATMENT OF WATER	TYPICAL DOSAGE IN ppm or mg/1
Disinfection	
Free Residual	1 – 10
Combined Residual	1 – 5
Taste & Odor Control	1 – 10
Algae or Slime	1 – 10
Iron & Sulfur Bacteria	up to 10
Removal of:	
Color	depends on type and amount of color removal needed. Can vary from 1 to 500 ppm:
Iron	0.64 X Fe content
Manganese	1.30 X Mn content
Hydrogen Sulfide:	
Taste & Odor Control	2 X H2S content
Total Destruction	8.4 X H2S content
Cooling Water	1 – 10
Chilling Water	5 – 25
Washdown Water	25 – 50

CHLORINATION TREATMENT OF WASTE WATER	TYPICAL DOSAGE IN ppm or mg/1
Disinfection of:	
Sand Filter Effluent	1 – 5
Activated Sludge Effluent	2 – 10
Trickling Filter Effluent	3 – 10
Chemical Precipitation Effluent	3 – 10
Raw Sewage	5 – 20
Settled Sewage	5 – 25
Septic Raw Sewage	10 – 25
Septic Settled Sewage	10 – 40
B.O.D. Reduction:	
Activated Sludge Effluent	5 – 15
Raw Screened Sewage	5 – 15
Odor Control:	
Up Sewer	2 – 20
Plant Influent	2 – 20
Trickling Filter Effluent	2 – 5
Digester Supernatant	200 – 300
Trickling Filter Ponding	5 – 20
Trickling Filter Flies	3 – 10
Imhoff Tank Foaming	3 – 15
Cyanide Destruction:	
Reduction to Cyanate	2.0 X cyanide content
Complete Destruction	8.5 X cyanide content