

# Chlorine Gas Exposure Limits



*Instrumentation Products*

Concentration (PPM)	Agency	Limit	Comments
0.02 - 0.2	---		Odor threshold (varies with individuals)
< 0.5	---		No known acute or chronic effect
0.5	ACGIH	8HR TWA	
1	OSHA	Ceiling Limit	Odor threshold for all individuals
	ACGIH	STEL	
	AIHA	ERPG-1	
1 - 10	---		Irritation of the eyes and mucous membranes of the upper respiratory tract. Severity of the symptoms dependent on the concentration and length of the exposure.
3	AIHA	ERPG-2	Slight irritation of the nose and throat.
5	---		Irritation of the respiratory tract and eyes
10	NIOSH	IDLH	
20	AIHA	ERPG-3	Immediate severe irritation of the respiratory tract, intense coughing and choking.
30	---		Shortness of breath, chest pain; possibly nausea and vomiting.
40 - 60	---		Development of chemical bronchitis and fluid in the lungs, which may occur after several hours; chemical pneumonia may occur several days later.
500	NIOSH	5 min.	Lowest concentration reported to have caused death in humans and animals.
840	NIOSH	30 min.	Lethal to 50% of human population.
1000	---		Immediately life threatening.

## ABBREVIATIONS, TERMS and DEFINITIONS

ACGIH	American Conference of Governmental Industrial Hygienists
AIHA	American Industrial Hygiene Association
Ceiling	The employees exposure which shall not be exceeded during any part of the work day. If instantaneous monitoring is not feasible, then the ceiling shall be assessed as a 15-minute TWA which shall not be exceeded at any time over a working day.
EPA	Environmental Protection Agency
ERPG	Emergency Response Planning Guidelines

ERPG-1	The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odor.
ERPG-2	The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.
ERPG-3	The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing life threatening health effects
IDLH	Immediately Dangerous to Life or Health -represents the maximum concentration from which, in the event of respiratory failure, one could escape within 30 minutes without a respirator and without experiencing any escape-impaired (e. g. severe eye irritation) or irreversible health effects.
NIOSH	National Institute of Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit -Time-weighted average (TWA) concentrations that must not be exceeded during any 8-hour work shift of a 40-hour workweek, as defined by OSHA.
PPM	Parts Per Million
STEL	Short Term Exposure Level -The employee's 15 minute time weighted average which should not be exceeded at any time during the work day. In some cases a STEL of another time limit (e. g. STEL (30)) may be specified.
TLV *	Threshold Limit Value, as defined by ACGIH
TWA*	Time Weighted Average -The employee's average airborne exposure in any 8-hour shift of a 40 hour workweek which should not be exceeded.
	* NOTE: The acronym "TLV-TWA" may appear in some literature. This carries the same definition as for TWA.

Above information compiled from :  
The Chlorine Institute; Pamphlet #65 Personal Protective Equipment for Chlorine and Sodium hydroxide  
The Chlorine Institute; The Chlorine Manual Sixth Edition  
ISA proposed instrument standard for gas leak detectors

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