

**BAY AREA CHEMICAL CONSORTIUM  
BID FORM FOR BID NO. 10-2026  
FOR SUPPLY AND DELIVERY OF LIQUID CHLORINE**

Sealed bids must be submitted in a PDF format and bidders must enter bid prices into the electronic bid platform (Line Item page)

<https://bacwa.org/about-bacc/>

No later than 4:00 PM. PT  
Thursday, February 19, 2026

Legal Name of Bidder:

Thatcher Company of California, Inc

Business Address

8625 Unsworth Avenue

Sacramento, CA 95828

Telephone Number: (916) 389-2517

Facsimile Number: (916) 389-2516

Email Address: bids1@tchem.com

Authorized Representative (Please Print):

Michael T Mitchell / President

Signature: 

Date: February 18, 2026

**I. All costs except California State sales tax and tariffs for the purchase of LIQUID CHLORINE must be included in the amount shown entered into the electronic bid platform (Line Item page), including any and all mill assessments, fees, excise taxes, transportation charges, etc. Any exceptions to the bid must be noted under Specific Deviations on the Standard Agreement. Bidders shall submit bids per unit of measure as specified in the electronic bid platform (Line Item page).**

**II. Bidders must submit all of the following, attached to this Bid Form:**

- a. All requirements listed in Section 2.21 Manufacturer's Info.
- b. If applicable, the name, address, and contact information for the third party hauling company as well as an affidavit signed by the Bidder that the third party hauler can and will deliver the chemical to each and every participating BACC Agency.

**III. Bidder Obligations**

By signing this Bid Form and entering into individual purchase orders, purchase agreements and /or contracts with BACC agencies, the bidder expressly agrees to be bound by all the provisions of the bid solicitation, including Sections I-IV.

**THATCHER COMPANY OF CALIFORNIA, INC.**  
8625 Unsworth Avenue, Sacramento, CA 95828



Phone (916) 389-2517  
Fax (916) 389-2516

February 17, 2026

## **AFFIDAVIT OF COMPLIANCE**

### **Liquid Chlorine**

This affidavit certifies and warrants the liquid chlorine to be delivered to the Bay Area Chemical Consortium Agencies by Thatcher Company of California, Inc. fully complies with A.W.W.A. Specifications and ANSI/NSF Standard 60.

A handwritten signature in blue ink, appearing to read 'M. Mitchell', is written above a horizontal line.

Michael T. Mitchell  
President



**NSF International**

789 N. Dixboro Rd. Ann Arbor, MI 48105, USA  
1-800.NSF.MARK | +1-734.769.8010 | www.nsf.org

# TEST REPORT

**Send To: 07870**

Mr. Matt Shewan  
Chemtrade Electrochem Inc.  
144 - 4th Avenue Southwest  
Suite 2100  
Calgary, Alberta T2P 3N4  
Canada

**Facility: 07871**

Chemtrade Electrochem Inc.  
100 Amherst Avenue  
North Vancouver BC V7H 1S4  
Canada

Result	PASS	Report Date	01-DEC-2017
Customer Name	Chemtrade Electrochem Inc.		
Tested To	NSF/ANSI 60		
Description	Chlorine   Liquid		
Trade Designation	Chlorine		
Test Type	Annual Collection		
Job Number	A-00236286		
Project Number	W0376532		
Project Manager	Eleftheria Biers		

This report documents the testing of the referenced product to the requirements of NSF/ANSI Standard 60 (Drinking Water Treatment Chemicals - Health Effects). This standard establishes minimum requirements for chemicals, the chemical contaminants, and impurities that are added to drinking water from drinking water treatment chemicals. Contaminants produced as by-products through reaction of the treatment chemical with a constituent of the drinking water are not covered by this Standard. Reference the "About the Standard" section at the end of this report for additional information about NSF/ANSI Standard 60 and the products covered under this Standard.

**Thank you for having your product tested by NSF International.**

Please contact your Project Manager if you have any questions or concerns pertaining to this report.

**Report Authorization**

Amanda Phelka - Director, Toxicology Services

**Date**

01-DEC-2017

**General Information**

Standard: NSF/ANSI 60  
 Chemical Name: Chlorine  
 DCC Number: DA00930  
 Maximum Use Level: 30 mg/L  
 Monitor Code: A  
 Physical Description of Sample: Liquid  
 Trade Designation/Model Number: Chlorine

Sample Id: **S-0001437503**  
 Description: Chlorine | Liquid  
 Sampled Date: 16-Nov-2017  
 Received Date: 16-Nov-2017

Tox Normalization Information:		Lab Normalization Information:	
Calculated NF	0.0075	Weight of chlorine	4.1 g
Preparation method used	E	Weight of water	1026.4 g
MUL	30 mg/L		
Compound Reference Key:	SPAC		

**Normalization Calculation:**

$$\text{Normalized Result} = \text{Test Result (ug/L)} * \text{NF} \quad \text{Where NF} = \text{MUL(mg/L)} * \frac{\text{Weight of Water Collected (g)}}{\text{Weight of Chlorine Collected (g)}} * \frac{1 \text{ L}}{10^3 \text{ g}} * \frac{1 \text{ g}}{10^3 \text{ mg}}$$

- MUL = Maximum Use Level;

- Unit conversion: 10<sup>3</sup> g water = 1 L water, 10<sup>3</sup> mg = 1g;

- An additional factor may be used to adjust the analytical result to field use conditions to account for product carryover, flushing, or other assumptions stipulated with the use of the product. If an additional factor is used, it is included in the information above.

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab</b>							
Volatile Organic Compounds (Ref: EPA 524.2)							
Dichlorodifluoromethane	ug/L	ND(5)		ND(5)	ND(0.04)	0.3	Pass
Chloromethane	ug/L	ND(50)		ND(50)	ND(0.38)	3	Pass
Vinyl Chloride	ug/L	ND(5)		ND(5)	ND(0.04)	0.2	Pass
Bromomethane	ug/L	ND(5)		ND(5)	ND(0.04)	1	Pass
Chloroethane	ug/L	ND(5)		ND(5)	ND(0.04)	0.04	Pass
Trichlorofluoromethane	ug/L	ND(5)		ND(5)	ND(0.04)	50	Pass
Trichlorotrifluoroethane	ug/L	ND(5)		ND(5)	ND(0.04)	0.3	Pass
Methylene Chloride	ug/L	ND(5)		ND(5)	ND(0.04)	0.5	Pass
1,1-Dichloroethylene	ug/L	ND(5)		ND(5)	ND(0.04)	0.7	Pass
trans-1,2-Dichloroethylene	ug/L	ND(5)		ND(5)	ND(0.04)	10	Pass
1,1-Dichloroethane	ug/L	ND(5)		ND(5)	ND(0.04)	0.3	Pass
2,2-Dichloropropane	ug/L	ND(5)		ND(5)	ND(0.04)		
cis-1,2-Dichloroethylene	ug/L	ND(5)		ND(5)	ND(0.04)	7	Pass
Chloroform	ug/L	ND(5)		ND(5)	ND(0.04)	[TTHM]	
Bromochloromethane	ug/L	ND(5)		ND(5)	ND(0.04)	0.3	Pass
1,1,1-Trichloroethane	ug/L	ND(5)		ND(5)	ND(0.04)	20	Pass
1,1-Dichloropropene	ug/L	ND(5)		ND(5)	ND(0.04)		



Sample Id: S-0001437503

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab ( Continued )</b>							
Carbon Tetrachloride	ug/L	ND(5)		ND(5)	ND(0.04)	0.5	Pass
1,2-Dichloroethane	ug/L	ND(5)		ND(5)	ND(0.04)	0.5	Pass
Trichloroethylene	ug/L	ND(5)		ND(5)	ND(0.04)	0.5	Pass
1,2-Dichloropropane	ug/L	ND(5)		ND(5)	ND(0.04)	0.5	Pass
Bromodichloromethane	ug/L	ND(5)		ND(5)	ND(0.04)	[TTHM]	
Dibromomethane	ug/L	ND(5)		ND(5)	ND(0.04)		
cis-1,3-Dichloropropene	ug/L	ND(5)		ND(5)	ND(0.04)	0.2	Pass
trans-1,3-Dichloropropene	ug/L	ND(5)		ND(5)	ND(0.04)	0.2	Pass
1,1,2-Trichloroethane	ug/L	ND(5)		ND(5)	ND(0.04)		
1,3-Dichloropropane	ug/L	ND(5)		ND(5)	ND(0.04)	0.3	Pass
Tetrachloroethylene	ug/L	ND(5)		ND(5)	ND(0.04)	0.5	Pass
Chlorodibromomethane	ug/L	ND(5)		ND(5)	ND(0.04)	[TTHM]	
Chlorobenzene	ug/L	ND(5)		ND(5)	ND(0.04)	10	Pass
1,1,1,2-Tetrachloroethane	ug/L	ND(5)		ND(5)	ND(0.04)	1	Pass
Bromoform	ug/L	ND(5)		ND(5)	ND(0.04)	[TTHM]	
1,1,2,2-Tetrachloroethane	ug/L	ND(5)		ND(5)	ND(0.04)	0.2	Pass
1,2,3-Trichloropropane	ug/L	ND(5)		ND(5)	ND(0.04)	4	Pass
1,3-Dichlorobenzene	ug/L	ND(5)		ND(5)	ND(0.04)	60	Pass
1,4-Dichlorobenzene	ug/L	ND(5)		ND(5)	ND(0.04)	7.5	Pass
1,2-Dichlorobenzene	ug/L	ND(5)		ND(5)	ND(0.04)	60	Pass
Carbon Disulfide	ug/L	ND(10)		ND(10)	ND(0.075)	70	Pass
Methyl-tert-Butyl Ether (MTBE)	ug/L	ND(5)		ND(5)	ND(0.04)	10	Pass
tert-Butyl ethyl ether	ug/L	ND(5)		ND(5)	ND(0.04)	2000	Pass
Methyl Ethyl Ketone	ug/L	ND(50)		ND(50)	ND(0.38)	400	Pass
Methyl Isobutyl Ketone	ug/L	ND(50)		ND(50)	ND(0.38)	700	Pass
Toluene	ug/L	ND(5)		ND(5)	ND(0.04)	100	Pass
Ethyl Benzene	ug/L	ND(5)		ND(5)	ND(0.04)	70	Pass
m+p-Xylenes	ug/L	ND(10)		ND(10)	ND(0.075)	[Xylenes]	
o-Xylene	ug/L	ND(5)		ND(5)	ND(0.04)	[Xylenes]	
Styrene	ug/L	ND(5)		ND(5)	ND(0.04)	10	Pass
Isopropylbenzene (Cumene)	ug/L	ND(5)		ND(5)	ND(0.04)	70	Pass
n-Propylbenzene	ug/L	ND(5)		ND(5)	ND(0.04)	0.3	Pass
Bromobenzene	ug/L	ND(5)		ND(5)	ND(0.04)		
2-Chlorotoluene	ug/L	ND(5)		ND(5)	ND(0.04)		
4-Chlorotoluene	ug/L	ND(5)		ND(5)	ND(0.04)		
1,3,5-Trimethylbenzene	ug/L	ND(5)		ND(5)	ND(0.04)		
tert-Butylbenzene	ug/L	ND(5)		ND(5)	ND(0.04)	10	Pass
1,2,4-Trimethylbenzene	ug/L	ND(5)		ND(5)	ND(0.04)		



Sample Id: S-0001437503

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab ( Continued )</b>							
sec-Butylbenzene	ug/L	ND(5)		ND(5)	ND(0.04)		
p-Isopropyltoluene (Cymene)	ug/L	ND(5)		ND(5)	ND(0.04)		
1,2,3-Trimethylbenzene	ug/L	ND(5)		ND(5)	ND(0.04)		
n-Butylbenzene	ug/L	ND(5)		ND(5)	ND(0.04)	0.3	Pass
1,2,4-Trichlorobenzene	ug/L	ND(5)		ND(5)	ND(0.04)	7	Pass
Hexachlorobutadiene	ug/L	ND(5)		ND(5)	ND(0.04)	0.4	Pass
1,2,3-Trichlorobenzene	ug/L	ND(5)		ND(5)	ND(0.04)		
Naphthalene	ug/L	ND(5)		ND(5)	ND(0.04)	10	Pass
Benzene	ug/L	ND(5)		ND(5)	ND(0.04)	0.5	Pass
Total Trihalomethanes	ug/L	ND(0.5)		ND(0.5)	ND(0.004)	8	Pass
Total Xylenes	ug/L	ND(0.5)		ND(0.5)	ND(0.004)	1000	Pass
1 - If the acceptance criteria is blank and the evaluation status is "Fail", then the criteria used will be noted on the letter accompanying these results.							
[Xylenes] - Acceptance based on Total Xylenes							
[TTHM] - Acceptance based on Total Trihalomethanes							



**Common Terms and Acronyms Used:**

Sample.....	Test result on the submitted product sample after prepared or exposed in accordance with the standard.
Control.....	Test result on a laboratory blank sample analyzed in parallel with the sample.
Result.....	Sample test result minus the Control test result.
Normalized Result...	Result normalized in accordance with the test standard to reflect potential at-the-tap concentrations
ND().....	Result is below the detection level of the analytical procedure as identified in the parenthesis.
DCC Number.....	NSF document control code of the registered formulation of the product tested
ug/L.....	Microgram per liter = 0.001 milligram per liter (mg/L)
SPAC.....	Acceptance criteria of the standard (Single Product Allowable Concentration)

**References to Testing Procedures:**

NSF Reference	Parameter / Test Description
C4662	Volatile Organic Compounds (Ref: EPA 524.2)

Test descriptions preceded by an asterisk "\*" indicate that testing has been performed per NSF International requirements but is not within its scope of accreditation.

**Testing Laboratories:**

Id	Address
All work performed at: → NSF_AA	NSF International 789 N. Dixboro Road Ann Arbor MI 48105



**About the Standard:**

NSF/ANSI Standard 60: Drinking Water Treatment Chemicals - Health Effects

NSF/ANSI 60 establishes minimum health effects requirements for the chemicals, the chemical contaminants, and the impurities that are directly added to drinking water from drinking water treatment chemicals. It does not establish performance or taste and odor requirements. The standard contains requirements for chemicals that are directly added to water and are intended to be present in the finished water as well as other chemical products that are added to water but are not intended to be present in the finished water. Chemicals covered by this Standard include, but are not limited to, coagulation and flocculation chemicals, softening, precipitation, sequestering, pH adjustment, and corrosion/scale control chemicals, disinfection and oxidation chemicals, miscellaneous treatment chemicals, and miscellaneous water supply chemicals.

The testing performed to this standard is done to estimate the level of contaminants or impurities added to drinking water when the chemical is used at the "Maximum Use Level" under attestation. Prior to testing, information is obtained on the formulation and sources of supply used to manufacture the chemical. This information is then reviewed along with the minimum requirements of the standard to establish the potential contaminants of concern. A representative sample of chemical is obtained for testing. The chemical sample is prepared for analysis through specific methods established in the standard based on the type of chemical and then is analyzed for potential contaminants determined during the formulation review. The laboratory results are normalized to represent potential at-the-tap values and then compared to the "single product allowable concentration" (SPAC) established by the standard. The product is found in compliance with the standard if the normalized value is less than or equal to the allowable concentration.



**CHEMTRADE**

**Certificate Of Analysis**

Chemtrade Electrochem Inc.  
North Vancouver Plant  
100 Amherst Avenue  
North Vancouver BC V7H 1S4  
T 604-929-1107 F 604-929-7600

To: THATCHER COMPANY OF CALIFORNIA INC  
8625 Unsworth Avenue  
SACRAMENTO CA 95828  
USA

B/L Number :81900635  
Carrier :Union Pacific Railroad  
Our Order :2929730  
Date Shipped :Jan 06,2024  
Vehicle :TILX600207  
Customer P.O.. :2251002898  
Seal Numbers :14860  
Quantity Shipped : 81.646 Tonne  
Equivalent Qty : 179,996.772 LBS

Material: Liquid Chlorine



The material furnished under this Certificate of Analysis conforms to the specification below as determined by historical data. The most recent complete liquid chlorine railcar analysis result is also provided as per the customer's request.

Complies to NSF/ANSI/CAN 60  
Maximum Use Level 30 mg/L

Batch: 0000384392 / Quantity: 81.646 TM

Parameter	Unit	Test Result	Specification		
			Min	Max	
Chlorine (Cl <sub>2</sub> )	%	99.5900	99.5000		
Moisture	PPM	22.0000		50.0000	
Chloroform (CHCl <sub>3</sub> )	PPM	< 0.5000		50.0000	
Carbon Tetrachloride (CCl <sub>4</sub> )	PPM	< 0.5000		15.0000	
Non Volatile Residue	PPM	< 10.0000		50.0000	
Bromine (Br)	PPM	< 2.0000		25.0000	
Nitrogen Trichloride (NCl <sub>3</sub> )	PPM	0.8800		5.0000	
NSF Certified	-	NSF® - 60 (MUL 30 MG/L)			

ppm is equivalent to mg/Kg

% is equivalent to % by Volume unless otherwise noted

Q Analysis Based on Shipment/Batch Sample

A Calculated Value

I Most Recent Analysis Prior to Shipment

Values with "<" indicate less than method detection limit.

Approved By: Bert Weger, Senior Process Engineer



**Responsible Care®**  
Our commitment to sustainability.



## LIQUID CHLORINE General Sales Specification

Parameters	Units	Specification
Chlorine	Volume %	99.5 Min.
Moisture	ppm	50 Max.
Non-Volatile Residue	ppm	50 Max.
Carbon Tetrachloride	ppm	15 Max.
Chloroform	ppm	50 Max.
Bromine	ppm	25 Max.
Nitrogen Trichloride	ppm	5 Max.

### NOTES:

- ❖ Meets the properties in AWWA Standard B301-10
- ❖ Meets the properties in the latest edition of the Food Chemicals Codex (FCC) Cl<sub>2</sub> Monograph.
- ❖ Certified by NSF International to NSF/ANSI Standard 60 Drinking Water Treatment Chemicals for use at a maximum level of 30 mg/L.

### IMPORTANT:

*The information presented herein, while not guaranteed, was prepared by technical personnel and is true and accurate to the best of our knowledge. No warranty or guarantee, expressed or implied, is made regarding performance, stability or otherwise. This information is not intended to be all-inclusive as the manner and conditions of use, handling, storage and other factors may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended as, and nothing shall be construed as, a recommendation to infringe any existing patents or to violate any Federal, State, Provincial and local laws.*

Date Approved: October 2017

Revision Number: 2017-001

Chemtrade Electrochem Inc.

Customer Service Group

155 Gordon Baker Road

Toronto, Ontario

M2H 3N5

Phone: 1-866-640-1593/1-866-330-3772

Fax: (514) 640-4858

File ID: LPSC/PSCR/Chlorine-10002017



Certified to NSF/ANSI  
Standard 60



**Responsible Care®**  
Our commitment to sustainability.



The Public Health and Safety Organization

## NSF Product and Service Listings

These NSF Official Listings are current as of **Saturday, February 15, 2025** at 12:15 a.m. Eastern Time. Please contact NSF to confirm the status of any Listing, report errors, or make suggestions.

Alert: NSF is concerned about fraudulent downloading and manipulation of website text. Always confirm this information by clicking on the below link for the most accurate information: <http://info.nsf.org/Certified/PwsChemicals/Listings.asp?CompanyName=Chemtrade+Electrochem&ChemicalName=Chlorine&>

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### NSF/ANSI/CAN 60 Drinking Water Treatment Chemicals - Health Effects

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#### Chemtrade Electrochem Inc.

155 Gordon Baker Road

Suite 300

Toronto, ON M2H 3N5

Canada

1-866-887-8805

416-496-5856

Visit this company's website (<http://www.chemtradelogistics.com>)

**Facility :** No. Vancouver, British Columbia, Canada

#### Chlorine[CL]

<i>Trade Designation</i>	<i>Product Function</i>	<i>Max Use</i>
Chlorine	Disinfection & Oxidation	30mg/L

[CL] The residual levels of chlorine (hypochlorite ion and hypochlorous acid), chlorine dioxide, chlorate ion, chloramine and disinfection by-products shall be monitored in the finished drinking water to ensure compliance to all applicable regulations.

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Number of matching Manufacturers is 1

Number of matching Products is 1

Processing time was 0 seconds



# SAFETY DATA SHEET



## Chlorine

### Section 1. Identification

**GHS product identifier** : Chlorine  
**Chemical name** : Chlorine  
**Code** : 0007  
**Other means of identification** : Not available.  
**Product type** : Liquid.

Relevant identified uses of the substance or mixture and uses advised against

**Identified uses** : Pulp bleaching, water treatment, manufacture of plastics, organic and inorganic chlorides, refrigerants and pharmaceuticals.

**Supplier's details** :

<p><b>Chemtrade Electrochem Inc.</b>                  100 Amherst Ave                  North Vancouver, British Columbia                  V7H 1S4, CA                  Emergency #: (604)-929-3441                  Toll free: 1-800-699-6924</p>	<p><b>Chemtrade Logistics Inc.</b>                  Suite 300, 155 Gordon Baker Road                  Toronto, Ontario                  M2H 3N5, CA                  Phone: (416)-496-5856</p>
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**Emergency telephone number (with hours of operation)** : CANUTEC: +1-613-996-6666 or \*666 (cellular) 2-C-0808  
 CHEMTREC, U.S.: 1-800-424-9300 International: +1-703-527-3887  
 CCN 15610

### Section 2. Hazards identification

**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

**Classification of the substance or mixture** :

- OXIDIZING GASES - Category 1
- GASES UNDER PRESSURE - Compressed gas
- ACUTE TOXICITY (inhalation) - Category 3
- SKIN IRRITATION - Category 2
- EYE IRRITATION - Category 2A
- SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
- AQUATIC HAZARD (ACUTE) - Category 1
- AQUATIC HAZARD (LONG-TERM) - Category 1

GHS label elements

**Hazard pictograms** :



**Signal word** : Danger

## Section 2. Hazards identification

- Hazard statements** : H270 - May cause or intensify fire; oxidizer.  
 H280 - Contains gas under pressure; may explode if heated.  
 H331 - Toxic if inhaled.  
 H319 - Causes serious eye irritation.  
 H315 - Causes skin irritation.  
 H335 - May cause respiratory irritation.  
 H410 - Very toxic to aquatic life with long lasting effects.
- Precautionary statements**
- Prevention** : P280 - Wear protective gloves. Wear eye or face protection.  
 P284 - Wear respiratory protection.  
 P220 - Keep away from clothing, incompatible materials and combustible materials.  
 P244 - Keep reduction valves free from grease and oil.  
 P271 - Use only outdoors or in a well-ventilated area.  
 P273 - Avoid release to the environment.  
 P260 - Do not breathe vapor.  
 P264 - Wash hands thoroughly after handling.  
 P270 - Do not eat, drink or smoke when using this product.
- Response** : P391 - Collect spillage.  
 P370 + P376 - In case of fire: Stop leak if safe to do so.  
 P304 + P340 + P310 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician.  
 P302 + P352 + P362-2 + P363 - IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse.  
 P332 + P313 - If skin irritation occurs: Get medical attention.  
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
 P337 + P313 - If eye irritation persists: Get medical attention.  
 P301 + P330 - if swallowed rinse mouth  
 P331 - Do not induce vomiting. Seek medical advice.
- Storage** : P405 - Store locked up.  
 P410 - Protect from sunlight.  
 P403 - Store in a well-ventilated place.
- Disposal** : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Other hazards which do not result in classification/ HHNOC/PHNOC** : None known.

## Section 3. Composition/information on ingredients

- Substance/mixture** : Substance  
**Chemical name** : Chlorine  
**Other means of identification** : Not available.

### CAS number/other identifiers

- CAS number** : 7782-50-5  
**Product code** : 0007

Ingredient name	%	CAS number
Chlorine	>99	7782-50-5

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

### Section 3. Composition/information on ingredients

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

### Section 4. First aid measures

#### Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of lukewarm water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 30 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of lukewarm water. Continue to rinse for at least 30 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

#### Most important symptoms/effects, acute and delayed

##### Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : Fatal if inhaled. May cause respiratory irritation. May cause lung edema. Symptoms can be delayed.  
Immediately dangerous to life or health: 10ppm.
- Skin contact** : Causes skin irritation.
- Ingestion** : Irritating to mouth, throat and stomach.

##### Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:  
pain or irritation  
watering  
redness
- Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing  
unconsciousness  
shortness of breath  
headache  
nausea or vomiting  
may cause lung damage  
Fatal if inhaled.

## Section 4. First aid measures

- Irritation threshold: approximately 0.5 ppm  
Immediately dangerous to life or health: 10 ppm
- Skin contact** : Adverse symptoms may include the following:  
irritation  
redness
- Ingestion** : Not the normal route of exposure, causes digestive tract burns.

### Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : Direct water spray. Reacts with water. No water should be sprayed onto a leaking cylinder as spraying of water onto it promotes corrosion at the point of leakage as well as increasing the evaporation rate of chlorine.
- Specific hazards arising from the chemical** : Oxidizing material. This material increases the risk of fire and may aid combustion. Contact with combustible material may cause fire. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain. Contact with reactive metals e.g. aluminum, zinc and tin may result in the generation of flammable hydrogen. Water used for fire extinguishing, which has been in contact with the product, maybe corrosive. Water spray on active leak may promote accelerated corrosion of container and accelerate leakage. Risk of fire and explosion when in contact with combustible substances, ammonia and finely divided metals.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
halogenated compounds
- Special protective actions for fire-fighters** : Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. Evacuate area, In case of fire or explosion do not breathe fumes. Cylinders can burst violently when heated, due to excess pressure build up.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to: boots, gloves, hard hat, splash-proof goggles, full face shield and impervious clothing (i.e. chemically impermeable suit).

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. Ventilate enclosed areas to prevent formation of toxic, flammable or oxygen deficient atmospheres. Many gases are heavier than air and will spread along ground and collect in low or confined areas (basements, sewers, tanks).

**For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". For response to chlorine gas it is recommended to use as a minimum level "B" protection that is compatible to chlorine. For liquid spills it is recommended to utilize as a minimum enhanced level "B" (Enhanced Level "B" is the addition of a splash hood)/ Do not touch damaged containers or spilled materials unless wearing appropriate protective clothing. Responders can reference Chlorine Institute pamphlet #65 on PPE.

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage. Neutralize spilled material and collect spillage.

### Methods and materials for containment and cleaning up

**Spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

**Protective measures** : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from clothing, incompatible materials and combustible materials. Keep reduction valves free from grease and oil. Empty containers retain product residue and can be hazardous. Do not reuse container. Use only chlorine-compatible lubricants. Use in a sealed system and/or a well-ventilated area. Observe good hygiene practices.

**Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures. Remove contaminated clothing and protective equipment before entering eating areas.

## Section 7. Handling and storage

**Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Protect from sunlight. Store locked up. Separate from reducing agents and combustible materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Contents under pressure. Store at temperatures not exceeding 51°C/123.8°F

## Section 8. Exposure controls/personal protection

### Control parameters

#### United States

#### Occupational exposure limits

Ingredient name	Exposure limits
Chlorine	<b>ACGIH TLV (United States, 3/2016).</b> TWA: 0.5 ppm 8 hours. TWA: 1.5 mg/m <sup>3</sup> 8 hours. STEL: 1 ppm 15 minutes. STEL: 2.9 mg/m <sup>3</sup> 15 minutes. <b>NIOSH REL (United States, 10/2013).</b> CEIL: 0.5 ppm 15 minutes. CEIL: 1.45 mg/m <sup>3</sup> 15 minutes. <b>OSHA PEL (United States, 6/2016).</b> CEIL: 1 ppm CEIL: 3 mg/m <sup>3</sup>

#### Canada

#### Occupational exposure limits

Ingredient name	Exposure limits
Chlorine	<b>CA Alberta Provincial (Canada, 4/2009).</b> 15 min OEL: 2.9 mg/m <sup>3</sup> 15 minutes. 8 hrs OEL: 1.5 mg/m <sup>3</sup> 8 hours. 8 hrs OEL: 0.5 ppm 8 hours. 15 min OEL: 1 ppm 15 minutes. <b>CA British Columbia Provincial (Canada, 5/2015).</b> TWA: 0.5 ppm 8 hours. STEL: 1 ppm 15 minutes. <b>CA Ontario Provincial (Canada, 7/2015).</b> TWA: 0.5 ppm 8 hours. STEL: 1 ppm 15 minutes. <b>CA Quebec Provincial (Canada, 1/2014).</b> TWAEV: 0.5 ppm 8 hours. TWAEV: 1.5 mg/m <sup>3</sup> 8 hours. STEV: 1 ppm 15 minutes. STEV: 2.9 mg/m <sup>3</sup> 15 minutes. <b>CA Saskatchewan Provincial (Canada, 7/2013).</b> STEL: 1 ppm 15 minutes. TWA: 0.5 ppm 8 hours.

**Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Eyewash facilities and emergency shower must be available when handling this product.

**Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

#### Individual protection measures

## Section 8. Exposure controls/personal protection

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: Chemical goggles/face shield are recommended.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Wear appropriate chemical resistant clothing.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Wear appropriate thermal protective clothing when necessary.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

## Section 9. Physical and chemical properties

### Appearance

- Physical state** : Liquid. [Compressed gas.]
- Color** : Amber liquid or greenish-yellow gas.
- Odor** : Pungent.
- Odor threshold** : <1 ppm
- pH** : Reacts with water to product acidic solutions.
- Melting point** : -101°C (-149.8°F)
- Boiling point** : -34°C(-29.2°F)
- Flash point** : Not applicable.
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Not applicable.
- Lower and upper explosive (flammable) limits** : Not applicable.
- Vapor pressure** : 638.4 kPa (4788.4 mm Hg) [room temperature]
- Vapor density** : 2.5 [Air = 1]
- Relative density** : 2.5
- Solubility** : Not available.
- Solubility in water** : 7.41 g/l

## Section 9. Physical and chemical properties

- Partition coefficient: n-octanol/water** : Not available.
- Auto-ignition temperature** : Not applicable.
- Decomposition temperature** : Not available.
- Viscosity** : Dynamic (room temperature): 0.01 mPa·s (0.01 cP)

## Section 10. Stability and reactivity

- Reactivity** : No specific test data related to reactivity available for this product or its ingredients. Contact with combustible material may cause fire.
- Chemical stability** : This product is stable under normal conditions.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Conditions to avoid** : Keep away from heat, sparks and open flame. Heat may cause the cylinders to explode.
- Incompatible materials** : Reacts violently with many organic compounds, ammonia, hydrogen and finely divided metals causing fire and explosion hazard. Attacks many metals in presence of water. Attacks plastic, rubber and coatings. Chlorine is corrosive to most metals in the presence of moisture (>150 ppm water) or at high temperature. Combines with water to produce hydrochloric and hypochlorous acid. Chlorine reacts with carbon monoxide to produce toxic phosgene, and sulphur dioxide to produce sulfur chloride.
- Hazardous decomposition products** : Hydrogen Chloride, Hydrochloric Acids, Hypochlorous Acid.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Chlorine	LC50 Inhalation Gas.	Rat	293 ppm	1 hours

#### Irritation/Corrosion

There is no data available.

#### Sensitization

There is no data available.

#### Mutagenicity

There is no data available.

#### Carcinogenicity

#### Classification

Product/ingredient name	OSHA	IARC	NTP	ACGIH	EPA	NIOSH
Chlorine	-	-	-	A4	-	-

#### Reproductive toxicity

There is no data available.

#### Teratogenicity

There is no data available.

## Section 11. Toxicological information

### Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Chlorine	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

There is no data available.

### Aspiration hazard

There is no data available.

**Information on the likely routes of exposure** : Dermal contact. Eye contact. Inhalation. Ingestion.

### Potential acute health effects

- Eye contact** : Causes serious eye irritation.
- Inhalation** : Fatal if inhaled. May cause respiratory irritation. May cause lung edema. Symptoms can be delayed.  
Immediately dangerous to life or health: 10ppm.
- Skin contact** : Causes skin irritation.
- Ingestion** : Irritating to mouth, throat and stomach.

### Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:  
pain or irritation  
watering  
redness
- Inhalation** : Adverse symptoms may include the following:  
respiratory tract irritation  
coughing  
unconsciousness  
shortness of breath  
headache  
nausea or vomiting  
may cause lung damage  
Fatal if inhaled.  
Irritation threshold: approximately 0.5 ppm  
Immediately dangerous to life or health: 10 ppm
- Skin contact** : Adverse symptoms may include the following:  
irritation  
redness
- Ingestion** : Not the normal route of exposure, causes digestive tract burns.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

- Potential immediate effects** : Coughing, shortness of breath, headache, nausea or vomiting.
- Potential delayed effects** : Symptoms of Pulmonary edema may be delayed.

#### Long term exposure

- Potential immediate effects** : Shortness of breath, coughing

## Section 11. Toxicological information

**Potential delayed effects** : May cause damage to organs (lungs) through prolonged or repeated exposure. Repeated exposures at low levels may cause pulmonary impairment. May also increase the likelihood of respiratory disorders.

### Potential chronic health effects

**General** : No known significant effects or critical hazards.  
**Carcinogenicity** : No known significant effects or critical hazards.  
**Mutagenicity** : No known significant effects or critical hazards.  
**Teratogenicity** : No known significant effects or critical hazards.  
**Developmental effects** : No known significant effects or critical hazards.  
**Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

There is no data available.

## Section 12. Ecological information

### Toxicity

Product/ingredient name	Result	Species	Exposure
Chlorine	Acute EC50 5.1 ppm Marine water Acute EC50 930000 µg/L Fresh water Acute LC50 2.03 µg/L Fresh water Acute LC50 30 µg/L Fresh water Acute LC50 14 µg/L Fresh water	Algae - <i>Macrocystis pyrifera</i> - Young Aquatic plants - <i>Lemna minor</i> Crustaceans - <i>Asellus racovitzai</i> Daphnia - <i>Daphnia pulex</i> Fish - <i>Oncorhynchus mykiss</i>	4 days 4 days 2 days 48 hours 96 hours

### Persistence and degradability

There is no data available.

### Bioaccumulative potential

There is no data available.

### Mobility in soil

**Soil/water partition coefficient ( $K_{oc}$ )** : Not applicable.

**Other adverse effects** : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling empty containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Follow label warnings even after cylinder is emptied.

## Section 13. Disposal considerations

## Section 14. Transport information

	DOT	TDG	IMDG	IATA
<b>UN number</b>	UN1017	UN1017	UN1017	UN1017
<b>UN proper shipping name</b>	CHLORINE. Marine pollutant (Chlorine) RQ	CHLORINE. Marine pollutant (Chlorine)	CHLORINE. Marine pollutant (Chlorine)	CHLORINE
<b>Transport hazard class(es)</b>	2.3 (5.1, 8) 	2.3 (5.1, 8) 	2.3 (5.1, 8) 	2.3 (5.1, 8) 
<b>Packing group</b>	-	-	-	-
<b>Environmental hazards</b>	Yes.	Yes.	Yes.	Yes. The environmentally hazardous substance mark is not required.
<b>Additional information</b>	<p>Toxic - Inhalation hazard Zone B</p> <p>This product is not regulated as a marine pollutant when transported on inland waterways in sizes of ≤5 L or ≤5 kg or by road, rail, or inland air in non-bulk sizes, provided the packagings meet the general provisions of §§ 173.24 and 173.24a.</p> <p><b>Reportable quantity</b> 10 lbs / 4.54 kg [0.47974 gal / 1.816 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.</p> <p><b>Limited quantity</b> Yes.</p> <p><b>Packaging instruction</b> <b>Passenger aircraft</b> Quantity limitation: Forbidden. <b>Cargo aircraft</b> Quantity limitation: Forbidden.</p> <p><b>Special provisions</b> 2, B9, B14, T50, TP19</p>	<p>Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2.13-2.17 (Class 2), 2.23-2.25 (Class 5), 2.40-2.42 (Class 8), 2.7 (Marine pollutant mark).</p> <p>The marine pollutant mark is not required when transported by road or rail.</p> <p><b>Special provisions</b> 102</p>	<p>The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.</p>	<p>The environmentally hazardous substance mark may appear if required by other transportation regulations.</p> <p><b>Passenger and Cargo Aircraft</b> Quantity limitation: Forbidden <b>Cargo Aircraft Only</b> Quantity limitation: Forbidden</p>

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## Section 14. Transport information

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

## Section 15. Regulatory information

**U.S. Federal regulations** : **United States inventory (TSCA 8b):** This material is listed or exempted.  
**Clean Water Act (CWA) 311:** Chlorine  
**Clean Air Act (CAA) 112 regulated toxic substances:** Chlorine

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

Name	EHS	SARA 302 TPQ		SARA 304 RQ	
		(lbs)	(gallons)	(lbs)	(gallons)
Chlorine	Yes.	100	-	10	-

**SARA 304 RQ** : 10 lbs / 4.5 kg [0.48 gal / 1.8 L]

### SARA 311/312

**Classification** : Sudden release of pressure  
 Immediate (acute) health hazard

#### Composition/information on ingredients

Name	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Chlorine	No.	Yes.	No.	Yes.	No.

### SARA 313

	Product name	CAS number
<b>Form R - Reporting requirements</b>	Chlorine	7782-50-5
<b>Supplier notification</b>	Chlorine	7782-50-5

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

## Section 15. Regulatory information

### State regulations

- Massachusetts** : This material is listed.  
**New York** : This material is listed.  
**New Jersey** : This material is listed.  
**Pennsylvania** : This material is listed.

### California Prop. 65

No products were found.



This product has been certified to NSF/ANSI 60 (certificate number 07871-01) for a Maximum Use Level (MUL) of 30 mg/L.

### Canada

#### Canadian lists

- Canadian NPRI** : This material is listed.  
**CEPA Toxic substances** : This material is not listed.  
**Canada inventory** : This material is listed or exempted.

## Section 16. Other information

### Hazardous Material Information System (U.S.A.)

**Health :** 4 \* **Flammability :** 0 **Physical hazards :** 1

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

### National Fire Protection Association (U.S.A.)

**Health :** 4 **Flammability :** 0 **Instability :** 1 **Special :** OX

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

### Procedure used to derive the classification

Classification	Justification
OXIDIZING GASES - Category 1	Expert judgment
GASES UNDER PRESSURE - Compressed gas	According to package
ACUTE TOXICITY (inhalation) - Category 3	On basis of test data
SKIN IRRITATION - Category 2	Expert judgment
EYE IRRITATION - Category 2A	Expert judgment
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3	Expert judgment
AQUATIC HAZARD (ACUTE) - Category 1	Expert judgment
AQUATIC HAZARD (LONG-TERM) - Category 1	Expert judgment

### History

**Section 16. Other information**

Date of issue mm/dd/yyyy : 03/30/2017

Date of previous issue : 09/01/2015

Version : 2

Prepared by :

**Notice to reader**

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.