

1. Product and Company Identification

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Product Name

Total Chlorine Indicator Solution

Part Number

RXSOL-60-6205-051

Company Details:

RX MARINE INTERNATIONAL
105, A wing , BSEL , TECH PARK.
VASHI ,NEW BOMBAY 400703 INDIA

Branch : Kandla, Mumbai , Chennai, Vizag, Kolkata, UAE , OMAN , CANADA and KENYA

Phone

+91 22 20871200 - 1400

Fax

+91 22 27612100 ::AOH :0091 9821214367

Email

mail@rxmarine.com

Website

www.rxmarine.com

2. Composition / Information on ingredients

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Chemical Name

Chlorine

Cas no.

7782-50-5

Product code

001015

Other means of identification

Molecular chlorine; CHLORINE GAS; active chlorine released from chlorine; Dichlorine; Dichlor; Diatomic chlorine; Chlorine molecule; Chlorine mol.; Chlor mol.; Chlorine, liquefied; Liquid chlorine

3. Hazards Identification

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Prevention

Wear protective gloves. Wear protective clothing. Wear eye or face protection. In case of inadequate ventilation wear respiratory protection. Keep away from clothing and other combustible materials. Keep reduction valves, valves and fittings free from oil and grease. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Do not breathe gas.

Response

Collect spillage. In case of fire: Stop leak if safe to do so. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if

present and easy to do. Continue rinsing. Collect spillage. In case of fire: Stop leak if safe to do so. IF INHALED: Remove

person to fresh air and keep comfortable for breathing. Immediately call a POISON

CENTER or doctor. IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. IF ON

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IN EYES: Rinse cautiously with water for several minutes. Remove

	contact lenses, if
	present and easy to do. Continue rinsing.
Storage	Store locked up. Protect from sunlight. Store in a well-ventilated place
Disposal	None known.

4. First Aid Measures

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Potential acute health effects

Eye contact	Causes serious eye damage. Contact with rapidly expanding gas may cause burns or frostbite.
Inhalation	Fatal if inhaled.
Skin contact	Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.
Frostbite	Try to warm up the frozen tissues and seek medical attention.
Ingestion	As this product is a gas, refer to the inhalation section.

Over-exposure signs/symptoms

Eye contact	Adverse symptoms may include the following:, pain, watering, redness
Inhalation	No specific data
Skin contact	Adverse symptoms may include the following:, pain or irritation, redness, blistering may occur.
Ingestion	Adverse symptoms may include the following:, stomach pains

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.
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. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

5. Fire-fighting Measures

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Suitable extinguishing media	Use an extinguishing agent suitable for the surrounding fire
Special hazards arising from the substance or mixture	None known
Specific hazards arising from the chemical	Contains gas under pressure. Oxidizing material. This material increases the risk of fire and may aid combustion. Contact with combustible material may cause fire. In a fire or if heated, a pressure increase will occur and the container may burst or explode.
	This material is very toxic to aquatic life. Fire water contaminated with this material must be contained and prevented from being discharged to

	any waterway, sewer or drain.
Hazardous thermal decomposition products	Decomposition products may include the following materials halogenated compounds
Special protective actions for fire-fighters	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk.
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.

6. Accidental Release Measures

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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. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
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 nonemergency personnel". Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel".
Environmental precautions	Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. 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.
Small spill	Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
Large spill	Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. Handling and Storage

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Precautions for safe handling	
Protective measures	Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and

Advice on general occupational hygiene

Conditions for safe storage, including any incompatibilities

Ingredient name
PERSONAL PROTECTION
chlorine

8. Exposure controls and personal protection

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Exposure limits
ACGIH TLV (United States, 3/2019).
STEL: 2.9 mg/m ³ 15 minutes.
STEL: 0.4 ppm 15 minutes.
TWA: 1.5 mg/m ³ 8 hours.
TWA: 0.1 ppm 8 hours.
NIOSH REL (United States, 10/2016).
CEIL: 1.45 mg/m ³ 15 minutes.
CEIL: 0.5 ppm 15 minutes.
OSHA PEL (United States, 5/2018).
CEIL: 3 mg/m ³
CEIL: 1 ppm
OSHA PEL 1989 (United States, 3/1989).
STEL: 3 mg/m ³ 15 minutes.
STEL: 1 ppm 15 minutes.
TWA: 1.5 mg/m ³ 8 hours.
TWA: 0.5 ppm 8 hours.
California PEL for Chemical Contaminants (
Table AC-1) (United States).

PEL: 0.5 ppm 8 hours.

STEL: 1 ppm 15 minutes.

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.

Environmental exposure controls

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

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 splash goggles and/ or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

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

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.

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. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

9. Physical and chemical properties

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Appearance

Gas. [GREENISH-YELLOW GAS WITH SUFFOCATING ODOR]

Physical state

Colorless. Green. Yellow.

Colour

Pungent.

Odour

No data available

Odour Threshold

No data available

pH

-101°C (-149.8°F)

Melting point

-34°C (-29.2°F)

Boiling point

143.85°C (290.9°F)

Critical temperature

Flash point	[Product does not sustain combustion.]
Evaporation rate	No data available
Flammability (solid, gas)	Extremely flammable in the presence of the following materials or conditions: reducing materials, combustible materials, organic materials and alkalis.
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	85.3 (psig)
Vapour density	2.5 (Air = 1)
Specific Volume (ft ³ /lb)	5.4054
Gas Density (lb/ft ³)	0.185
Relative density	Not applicable.
Solubility	Very slightly soluble in the following materials: cold water.
Solubility in water	7.41 g/l
Partition coefficient: noctanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Flow time (ISO 2431)	Not available.
Molecular weight	70.9 g/mole

10. Stability and reactivity

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Reactivity	No specific test data related to reactivity available for this product or its ingredients
Chemical stability	The product is stable.
Possibility of hazardous reactions	<p>Hazardous reactions or instability may occur under certain conditions of storage or use. Conditions may include the following contact with combustible materials Reactions may include the following:</p> <p>risk of causing fireHazardous reactions or instability may occur under certain conditions of storage or use.</p> <p>Conditions may include the following:</p> <p>contact with combustible materials</p> <p>Reactions may include the following:</p> <p>risk of causing fire</p> <p>Heat, flames and sparks.</p> <p>Oxidizing agents, Copper</p> <p>No specific data.</p> <p>Highly reactive or incompatible with the following materials: combustible materials reducing materials grease oil</p> <p>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</p> <p>see section 5</p> <p>Under normal conditions of storage and use, hazardous polymerization will not occur.</p>
Conditions to avoid	
Incompatible materials	
Hazardous decomposition products	
Incompatible materials	
Hazardous decomposition products	
In the event of fire	
Hazardous polymerization	

11. Toxicological information

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Information on toxicological effects

Product/ingredient name	Result	Species	Dose	Exposure
chlorine	LC50 Inhalation Gas	Rat	293 ppm	1 hours
Product/ingredient name	Not available.			
Sensitization	Not available.			
Mutagenicity	Not available.			
Carcinogenicity	Not available.			
Reproductive toxicity	Not available.			
Teratogenicity	Not available.			
Specific target organ toxicity (single exposure)	Not available.			
Specific target organ toxicity (repeated exposure)	Not available.			
Aspiration hazard	Not available.			
Information on the likely routes of exposure	Not available.			
Eye contact	Causes serious eye damage. Contact with rapidly expanding gas may cause burns or frostbite.			
Inhalation	Fatal if inhaled.			
Skin contact	Causes severe burns. Contact with rapidly expanding gas may cause burns or frostbite.			
Ingestion	As this product is a gas, refer to the inhalation section.			
Symptoms related to the physical, chemical and toxicological characteristics				
Eye contact	Adverse symptoms may include the following:., pain, watering, redness			
Inhalation	No specific data.			
Skin contact	Adverse symptoms may include the following:., pain or irritation, redness, blistering may occur			
Ingestion	Adverse symptoms may include the following:., stomach pains			
Delayed and immediate effects and also chronic effects from short and long term exposure				
Short term exposure	Potential immediate effects	Not available.		
Long term exposure	Potential delayed effects	Not available.		
Potential immediate effects		Not available.		
Potential delayed effects		Not available.		
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.		

Acute toxicity estimates

Route	ATE value
Inhalation (gases)	146.5 ppm

12. Ecological information

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Chlorine	Acute EC50 5.1 ppm Marine water	Algae - <i>Macrocystis pyrifera</i>	4 days
	Acute EC50 930000 µg/l Fresh water	Aquatic plants - <i>Lemna minor</i>	4 days
		Crustaceans - <i>Asellus racovitzai</i>	2 days
	Acute LC50 2.03 µg/l Fresh water	Daphnia - <i>Daphnia pulex</i>	48 hours

Acute LC50 30 µg/l Fresh water

Fish - Oncorhynchus mykiss

96 hours

Acute LC50 14 µg/l Fresh water

Persistence and degradability

Not available.

Bioaccumulative potential

Not available.

Soil/water partition coefficient (Koc)

Not available.

Other adverse effects

No known significant effects or critical hazards.

13. Disposal considerations

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Disposal methods

The generation of waste should be avoided or minimized wherever possible. Disposal

of this product, solutions and any by-products should at all times 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. Empty Airgas-owned pressure vessels should be returned to Airgas. 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. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

14. Transport information

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	DOT	TDG	Mexico	IMDG	IATA
UN number	UN1017	UN1017	UN1017	UN1017	UN1017
UN proper shipping name	CHLORINE	CHLORI	CHLORINE	CHLORINE	CHLORINE
Environmental hazards	Yes.	Yes.	Yes. The	Yes.	Yes. The
			environmentally		environmentally
			hazardous		hazardous
			substance mark is not required.		substance mark is not required.

Additional information

DOT Classification

Toxic - Inhalation hazard Zone B

This product is not regulated as a marine pollutant when transported on inland waterways in sizes of 75 L or 75 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.

Reportable quantity 10 lbs / 4.54 kg. Package sizes shipped in quantities less than

the product reportable quantity are not subject to the RQ (reportable quantity)

	transportation requirements.
	Limited quantity Yes.
	Quantity limitation Passenger aircraft/rail: Forbidden. Cargo aircraft: Forbidden.
	Special provisions 2, B9, B14, T50, TP19
TDG Classification	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).
	The marine pollutant mark is not required when transported by road or rail.
	Explosive Limit and Limited Quantity Index 0
	ERAP Index 500
	Passenger Carrying Vessel Index Forbidden
	Passenger Carrying Road or Rail Index Forbidden
IMDG	The marine pollutant mark is not required when transported in sizes of 75 L or 75 kg.
IATA	The environmentally hazardous substance mark may appear if required by other
	transportation regulations. Quantity limitation Passenger and Cargo Aircraft: Forbidden. Cargo Aircraft Only: Forbidden.
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
Transport in bulk according to IMO instruments	Not available.

15. Regulatory information

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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

State regulations	
Massachusetts	This material is listed.
New York	This material is listed.
New Jersey	This material is listed..
Pennsylvania	This material is listed.
International regulations	
Chemical Weapon Convention List Schedules I, II & III Chemicals	Not listed.
Chemical Weapon Convention List Schedules I, II & III Chemicals	Not listed.
Stockholm Convention on Persistent Organic Pollutants	Not listed.
Stockholm Convention on Persistent Organic Pollutants	Not listed.

Stockholm Convention on Persistent Organic Pollutants	Not listed.
Inventory list	This material is listed or exempted.
Australia	This material is listed or exempted.
Canada	This material is listed or exempted.
Europe	This material is listed or exempted.
Japan	Japan inventory (ENCS): Not determined.
	Japan inventory (ISHL): Not determined.
New Zealand	This material is listed or exempted.
Philippines	This material is listed or exempted.
Republic of Korea	This material is listed or exempted.
Taiwan	This material is listed or exempted.
Thailand	Not determined.
Turkey	This material is listed or exempted.
United States	This material is active or exempted.
Viet Nam	This material is listed or exempted.

16. Other information

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No data available

Other Information

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall we be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Rx Marine International has been advised of the possibility of such damages.

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Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

760 mm Hg @ 105°C

760 mm Hg @ 105°C