3B

SAFETY DATA SHEET

Version 1

1. Identification of the Substance / Preparation and of the Company / Undertaking

Product Name: Chlorine
UN/ID No UN1017
Formula: Cl_2
Molecular Weight: 70.91

Company Name:
Hawkins, Inc. 3100 E. Hennepin Avenue Minneapolis, MN 55413 (612-331-6910)

Emergency Telephone:
CHEMTREC (US): 1-800-424-9300

2. Hazards Identification

GHS - Classification

Acute toxicity - Inhalation (Gases)	Category 1
Acute toxicity - Inhalation (Dusts/Mists)	Category 1
Skin corrosion/irritation	Category 1 Category 1A
Serious eye damage/eye irritation	Category 1
Specific target organ toxicity (single exposure)	Category 1
Specific target organ toxicity (repeated exposure)	Category 1
Acute aquatic toxicity	Category 1
Chronic aquatic toxicity	Category 1

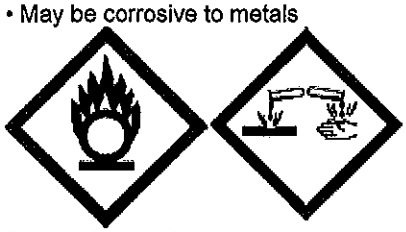
Signal Word: **Danger**
Hazard Statements:
- Fatal if inhaled
- Causes severe skin burns and eye damage
- Causes damage to organs
- Causes damage to organs through prolonged or repeated exposure
- Very toxic to aquatic life with long lasting effects

Physical Hazards

Oxidizing gases	Category 1
Corrosive to metals	Category 1

- May cause or intensify fire; oxidizer

• May be corrosive to metals



Precautionary Statements:
• P301 + P330 + P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting
• P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
• P363 - Wash contaminated clothing before reuse
• P280 - Wear protective gloves/protective clothing/eye protection/face protection
• P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
• P307 + P311 - IF exposed: Call a POISON CENTER or doctor/physician
• P264 - Wash face, hands and any exposed skin thoroughly after handling
• P270 - Do not eat, drink or smoke when using this product
• P314 - Get medical advice/attention if you feel unwell
• P501 - Dispose of contents/container to industrial incineration plant
• P273 - Avoid release to the environment
• P220 - Keep/Store away from clothing/ combustible materials
• P244 - Keep reduction valves free from grease and oil
• P370 + P376 - In case of fire: Stop leak if safe to do so
• P403 - Store in a well-ventilated place
• P334 - Immerse in cool water/wrap in wet bandages
• P390 - Absorb spillage to prevent material damage
• P406 - Store in corrosive resistant aluminum container with a resistant inliner
• P260 - Do not breathe dust/fume/gas/mist/vapors/spray
• P271 - Use only outdoors or in a well-ventilated area
• P284 - Wear respiratory protection
• P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
• P310 - Immediately call a POISON CENTER or doctor/physician
• P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
• P405 - Store locked up
• P501 - Dispose of contents/ container to an approved waste disposal plant

3. Composition / Information on Ingredients

Hazardous

Chemical Name	CAS No	Weight-%	EC No
Chlorine (elemental Cl and hypochlorite salts)	7782-50-5	99.5-100	231-959-5

4. First Aid Measures

General Advice: Immediate medical attention is required. If symptoms persist, call a physician. Immediate medical attention is not required. In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible). No hazards which require special first aid measures.

Eye Contact: Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Keep eye wide open while rinsing. Call a physician immediately. If symptoms persist, call a physician. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact: Immediate medical attention is required. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before reuse. Wash off immediately with plenty of water. If skin irritation persists, call a physician. Immediate medical attention is not required. Wash off immediately with soap and plenty of water.

Inhalation: Immediate medical attention is required. Move to fresh air. If not breathing, give artificial respiration. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Artificial respiration and/or oxygen may be necessary. Obtain medical attention. Immediate medical attention is not required. Move to fresh air in case of accidental inhalation of vapors. If symptoms persist, call a physician. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Immediately give oxygen if victim turns blue (lips, ears, fingernails). Call a physician or poison control center immediately.

Ingestion: Do NOT induce vomiting. Call a physician or poison control center immediately. Never give anything by mouth to an unconscious person. Drink plenty of water. Clean mouth with water and drink afterwards plenty of water. Obtain medical attention. Consult a physician if necessary.

Note to Physicians: Treat symptomatically.

Self-protection of the First Aider: Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

5. Fire-fighting Measures

Flammable Properties:
Not considered to be a fire hazard

Explosive Properties:
Reacts explosively or forms explosive compounds, with many chemicals, such as acetylene, turpentine, ether, ammonia gas, hydrogen and finely divided metals

Suitable Extinguishing Media:
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment

Unsuitable Extinguishing Media:
No information available

Protective Equipment and Precautions for Firefighters:
In the event of a fire, wear full protective clothing and MSHA/NIOSH (approved or equivalent) self-contained breathing apparatus with full facepiece operated in the pressure-demand or other positive pressure mode

6. Accidental Release Measures

Personal Precautions: Use personal protective equipment as required. Keep people away from and upwind of spill/leak. Evacuate personnel to safe areas.

Environmental Precautions: Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.

Methods for Containment: Prevent further leakage or spillage if safe to do so. Cover powder spill with plastic sheet or tarp to minimize spreading. Dike far ahead of liquid spill for later disposal.

Methods for Cleaning Up: Cover liquid spill with sand, earth or other non-combustible absorbent material. Cover powder spill with plastic sheet or tarp to minimize spreading. Sweep up and shovel into suitable containers for disposal. Soak up with inert absorbent material. Dam up. Pick up and transfer to properly labeled containers.

Other Information: Not applicable.

7. Handling and Storage

Advice on Safe Handling: Use personal protective equipment as required. Avoid contact with skin, eyes or clothing. Wash contaminated clothing before reuse. Do not breathe dust/fume/gas/mist/vapors/spray. Do not eat, drink or smoke when using this product. Use with local exhaust ventilation. Do not breathe dust/fume/gas/mist/vapors/spray. Do not smoke.

Storage Conditions: Keep out of the reach of children. Keep container tightly closed in a dry and well-ventilated place. Keep containers tightly closed in a cool, well-ventilated place. Keep in properly labeled containers. Keep containers tightly closed in a dry, cool and well-ventilated place.

Incompatible Materials: Tin; Metals; Sulfides; Titanium. Reacts with most metals at high tempuratures. Reacts with water to produce hydrochloric acids, which are corrosive to most metals. Ammonia, elemental metals, certain metal hydroxides, carbides, nitrides, oxides, phosphides and sulfides, easily oxidized materials, organic materials (e.g. oil grease) and unstable and reactive compounds

8. Exposure Controls / Personal Protection

Chemical Name	ACGIH TLV	OSHA PEL	Ontario TWA
Chlorine (elemental Cl and hypochlorite salts)	STEL: 1 ppm TWA: 0.5 ppm	1 ppm Ceiling 1 ppm STEL 3 mg/m³ Ceiling 3 mg/m³ STEL	TWA: 0.5 ppm STEL: 1 ppm

Chemical Name	European Union	China	Japan	Korea	Australia	Taiwan
Chlorine (elemental Cl and hypochlorite salts)		Ceiling: 1 mg/m³ Ceiling	Ceiling: 0.5 ppm Ceiling: 1.5 mg/m³ ISHL/ACL: 0.5 ppm	STEL: 1 ppm STEL: 3 mg/m³ TWA: 0.5 ppm TWA: 1.5 mg/m³	1 ppm Peak 3 mg/m³ Peak	

Exposure Guidelines Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992)

Engineering Controls: Ensure adequate ventilation, especially in confined areas

Personal protective equipment (PPE)

Eye/Face Protection: Tight sealing safety goggles. Face protection shield. Avoid contact with eyes.

Body Protection: Suitable protective clothing. Gloves made of plastic or rubber. Suitable protective clothing. Apron.

General Hygiene Considerations:
When using do not eat, drink or smoke. Regular cleaning of equipment, work area and clothing is recommended. Avoid contact with skin, eyes or clothing. Wash hands thoroughly after handling. Keep away from food, drink and animal feeding stuffs. Handle in accordance with good industrial hygiene and safety practice. Keep working clothes separately.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Physical State: Liquid Gas
Appearance: No information available
Color: Amber Green Yellow
Odor: Pungent
Odor Threshold: No information available

Property	Values	Remarks • Method
pH:		No information available
"Salt Out" Point (°F):		No information available
Melting Point/Freezing Point:	-101 °C / -150 °F	
Boiling Point/Boiling Range:	-34 °C / -29 °F	
Flash Point:		No information available
Evaporation Rate (BuAc=1):		No information available
Flammability (solid, gas):		No information available
Flammability Limits in Air:		No information available
Upper Flammability Limit:		

Lower Flammability Limit:		
Vapor Pressure (mm Hg) :	3671	
Vapor density (Air =1)	2.5	
Specific Gravity (H_2O=1):		No information available
Specific Gravity (2nd value):		No information available
Water Solubility:	Slightly soluble	
Solubility(ies):		No information available
Partition Coefficient (n-octanol/water)		No information available
Autoignition Temperature:		No information available
Decomposition Temperature:		No information available
Kinematic Viscosity:		No information available
Dynamic Viscosity:		No information available
Oxidizing Properties:	No information available	
Explosive Properties:	Reacts explosively or forms explosive compounds, with many chemicals, such as acetylene, turpentine, ether, ammonia gas, hydrogen and finely divided metals	

9.2. Other information

Softening Point:	No information available
Molecular Weight:	70.91
VOC Content(%):	No information available
Density:	1401.97g/Liter @ 15.6°C
Bulk Density:	No information available
% Volatiles by Volume @ 21°C (70°F):	100

10. Stability and Reactivity

Stability: Stable under normal conditions of use and storage

Conditions to Avoid: Heat, flames and sparks; Incompatibles; Moisture

Incompatible Materials: Tin; Metals; Sulfides; Titanium. Reacts with most metals at high tempuratures. Reacts with water to produce hydrochloric acids, which are corrosive to most metals. Ammonia, elemental metals, certain metal hydroxides, carbides, nitrides, oxides, phosphides and sulfides, easily oxidized materials, organic materials (e.g. oil grease) and unstable and reactive compounds

Hazardous Decomposition Products: None under normal use conditions

Possibility of Hazardous Reactions: None under normal processing

11. Toxicological Information

Product Information

Acute Toxicity: 0% of the mixture consists of ingredient(s) of unknown toxicity.

The following values are calculated based on chapter 3.1 of the GHS document

Chemical Name	Oral LD_{50} :	Dermal LD_{50} :	LC_{50} (Lethal Concentration):
Chlorine (elemental Cl and hypochlorite salts)			0.86 mg/L (Rat) 1 h 293 ppm (Rat) 1 h

Chronic Toxicity:

Carcinogenicity: This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP

Target Organ Effects: Eyes, Respiratory system, Skin

12. Ecological Information

Ecotoxicity

0.25% of the mixture consists of components(s) of unknown hazards to the aquatic environment

Toxic to aquatic life with long lasting effects Very toxic to aquatic life with long lasting effects

Chemical Name	Toxicity to algae	Toxicity to fish	Toxicity to daphnia and other aquatic invertebrates
Chlorine (elemental Cl and hypochlorite salts)		*0.44: 96 h Lepomis macrochirus mg/L LC50 flow-through 0.014: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 0.014: 96 h Oncorhynchus mykiss mg/L LC50 0.104 - 0.168: 96 h Oncorhynchus mykiss mg/L LC50 static 0.08: 96 h Pimephales promelas mg/L LC50 flow-through 0.1: 96 h Pimephales promelas mg/L LC50*	*0.017: 48 h Daphnia magna mg/L LC50*

Persistence and Degradability: No information available.

Bioaccumulation: No information available.

Mobility: No information available.

13. Disposal Considerations

Waste from Residues/Unused Products: Disposal should be in accordance with applicable regional, national and local laws and regulations

14. Transport Information

DOT

Proper shipping name	CHLORINE
Hazard Class	2.3
Subsidiary Class	8
Subsidiary Class 2	5.1
UN/ID No	UN1017
Reportable Quantity (RQ)	10
Marine pollutant	This product contains a chemical which is listed as a marine pollutant according to DOT.
Description	UN1017, CHLORINE, 2.3 (8, 5.1), POISON INHALATION HAZARD ZONE B, MARINE POLLUTANT

15. Regulatory Information

International Inventories

All of the components in the product are on the following Inventory lists: TSCA (United States):, Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Australia (AICS), South Korea (KECL):, China (IECSC), Philippines (PICCS),
This product contains a substance not listed on international inventories - it is for research and development use only.

AICS	Complies
TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	-
IECSC	Complies
KECL	Complies
PICCS	Complies

Chemical Name	AICS	TSCA	DSL	NDSL	EINECS	ELINCS	ENCS	IECSC	KECL	PICCS
Chlorine (elemental Cl and hypochlorite salts)	Listed	Listed	Listed	-	Listed	-	-	Listed	KE-05486	Present

Inventory Legend

AICS - Australian Inventory of Chemical Substances
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances

RESTRICTIONS - REACH TITLE VII No information available

US Federal Regulations

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

Chemical Name	CERCLA Hazardous Substances and the Reportable Quantities	SARA Extremely Hazardous Substances EPCRA RQ	SARA Extremely Hazardous Substances TPQ
Chlorine (elemental Cl and hypochlorite salts)	10 lb 4.54 kg	10 lb EPCRA RQ	100 lb TPQ

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	SARA 313 - Threshold Values %
Chlorine (elemental Cl and hypochlorite salts)	1.0

SARA 311/312 Hazard Categories

Acute health hazard	Yes
Chronic health hazard	No
Fire hazard	Yes
Sudden release of pressure hazard	Yes
Reactive hazard	No

U.S. State Right-to-Know Regulations

California Proposition 65:
This product does not contain any Proposition 65 chemicals

16. Other Information

National Fire Protection Association (NFPA) Ratings

NSF Certification

Certified to NSF/ANSI 60

Maximum Use (mg/L unless otherwise indicated):	30
Prepared By:	HSE Department
Issue Date:	03-May-2012
Revision Date:	23-Jul-2012
Revision Note:	MSDS converted to GHS SDS Format.

Disclaimer:
Please be advised that it is your responsibility to inform your employees of the hazards of this substance, to advise them of what these properties mean and be sure they understand exposure information. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication.

The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. No warranty or guaranty, express or implied, is made regarding performance, stability, or otherwise. This information is not intented to be all-inclusive as to the manner and conditions of use, handling, and storage. Other factors may require additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, the handling and use remains the responsibility of the consumer. No suggestions are intended as, and should not be constructed as, a recommendation to infringe on any existing patents or to violate any Federal, State, or local laws.

End of Safety Data Sheet