

MATERIAL SAFETY DATA SHEET

CHLOROCLEAN (6156)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Brenntag Canada Inc.
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WHMIS Number: 00060149
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Website: <http://www.brenntag.ca>

EMERGENCY TELEPHONE NUMBERS (FOR EMERGENCIES INVOLVING CHEMICAL SPILLS OR RELEASE)

Toronto, ON (416) 226-6117	Montreal, QC (514) 861-1211	Winnipeg, MB (204) 943-8827
Edmonton, AB (780) 424-1754	Calgary, AB (403) 263-8660	Vancouver, BC (604) 685-5036

PRODUCT IDENTIFICATION

Product Name: Chloroclean (6156).
Chemical Name: Not applicable.
Synonyms: Not applicable.
Chemical Family: Inorganic Acid.
Molecular Formula: Not applicable.
Product Use: Water treatment. Chemical intermediate. Plating chemicals. Oxidizing agent.
CAS #: 7647-01-0.
WHMIS Classification / Symbol: D-1A: Very Toxic (acute effects), E: Corrosive.



READ THE ENTIRE MSDS FOR THE COMPLETE HAZARD EVALUATION OF THIS PRODUCT.

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Corrosive! May be fatal if inhaled or swallowed. Causes severe skin and eye burns. Vapours are extremely irritating to eyes and respiratory tract. Prolonged or repeated exposure may cause discoloration and erosion of teeth. See "Other Health Effects" Section. Can decompose at high temperatures forming toxic gases. Reacts with water. Contents may develop pressure on prolonged exposure to heat.

POTENTIAL HEALTH EFFECTS

- Inhalation: Corrosive! Product may cause severe irritation of the nose, throat and respiratory tract. Repeated and/or prolonged exposures may cause productive cough, running nose, bronchopneumonia, pulmonary oedema (fluid build-up in lungs), and reduction of pulmonary function. Prolonged or repeated exposure may cause discoloration and erosion of teeth. See "Other Health Effects" Section.
- Skin Contact: Corrosive! Burns can occur if not promptly removed. Concentrated solutions may cause pain and deep and severe burns to the skin. Prolonged and repeated exposure to dilute solutions often causes irritation, redness, pain and drying and cracking of the skin. Toxic effects may be delayed. Avoid handling when the skin is moist, wet or abraided.

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- . Skin Absorption: Skin absorption is a secondary concern to the continual destruction of tissue while the product is in contact with the skin. Prolonged or wide spread skin contact may result in the absorption of potentially harmful amounts of material.
 - . Eye Contact: Extremely corrosive! This product causes corneal scarring and clouding. Glaucoma, cataracts and permanent blindness may occur.
 - . Ingestion: Corrosive! This product causes severe burning and pain in the mouth, throat and abdomen. Vomiting, diarrhea and perforation of the esophagus and stomach lining may occur. Prolonged or repeated exposure may cause discoloration and erosion of teeth.
- Other Health Effects: Corrosive effects on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential.

May cause ulcers of the upper respiratory tract and pulmonary oedema. Pulmonary oedema is the build-up of fluid in the lungs that might be fatal. Symptoms of pulmonary oedema, such as shortness of breath, may not appear until several hours after exposure and are aggravated by physical exertion. (4)

3. COMPOSITION, INFORMATION ON INGREDIENTS (Not Intended As Specifications)

Hazardous Ingredients	CAS No.	ACGIH TLV	%
Hydrochloric Acid	007647-01-0	2 ppm (Ceiling)	10 - 40

4. FIRST AID MEASURES

FIRST AID PROCEDURES

General Guidelines: Prompt removal of the material and obtaining medical attention are essential for all contact. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of water. Continue the flushing during transportation to the emergency department. Corrosive effects may be delayed (up to 72 hours), and damage may occur without the sensation or onset of pain. Contact local poison control centre for further guidance.

- . Inhalation: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Oxygen administration may be beneficial in this situation but should only be administered by personnel trained in its use. Obtain medical attention IMMEDIATELY.
- . Skin Contact: Prompt removal of the material from the skin is essential. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of water for a minimum of 30 minutes or up to 60 minutes for critical body areas. Obtain medical attention IMMEDIATELY.
- . Eye Contact: Immediately flush eyes with running water for a minimum of 30 minutes, preferably up to 60 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.
- . Ingestion: Do not attempt to give anything by mouth to an unconscious person. IMMEDIATELY contact local Poison Control Centre. If victim is alert and not convulsing, rinse mouth out and give 1 to 2 glasses of milk. Water may be used if milk is not available but it is not as effective. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more milk or water. IMMEDIATELY transport victim to an emergency facility.

Note to Physicians: Treatment for corrosive chemical contact with skin:

1. Immerse the exposed part immediately in ice water to relieve pain and to prevent swelling and blistering. Place cold packs, ice or wet cloths on the burned area if immersion is not possible.
2. Remove anything that is constrictive, such as rings, bracelets or footwear, before

swelling begins.

3. Cover the exposed part with a clean, preferably sterile, lint-free dressing.
4. For severe exposure, immediately seek medical attention and monitor breathing and treat for shock.

Due to the severely irritating or corrosive nature of the material, swallowing may lead to ulceration and inflammation of the upper alimentary tract with hemorrhage and fluid loss. Also, perforation of the esophagus or stomach may occur, leading to mediastinitis or peritonitis and the resultant complications. (3) Mucosal injury following ingestion of this corrosive material may contraindicate the induction of vomiting in the treatment of possible intoxication. Similarly, if gastric lavage is performed, intubation should be done with great care. If oral burns are present or a corrosive ingestion is suspected by the patient's history, perform esophagoscopy as soon as possible. Scope should not be passed beyond the first burn because of the risk of perforation.

This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed.

Medical conditions that may be aggravated by exposure to this product include neurological, cardiovascular and skin disorders, diseases of the skin, eyes or respiratory tract.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flammability Class (WHMIS): Not regulated.
Flash Point (TCC, Deg. Celsius): Non-combustible (does not burn).
Autoignition Temperature (Deg. Celsius): Not applicable.
Flammability Limits in Air (%): LEL: Not applicable. UEL: Not applicable.

Hazardous Combustion Products: Chlorine and Hydrogen Chloride.

Unusual Fire or Explosion Hazards: When heated, hydrogen chloride gas is liberated. Avoid direct contact of this product with water as this can cause a violent exothermic reaction. Reacts with most metals to produce hydrogen gas which could make an explosive mixture with air.

Sensitivity to Mechanical Impact: Not expected to be sensitive to mechanical impact.
Rate of Burning: Not available.
Explosive Power: Not available.
Sensitivity to Static Discharge: Not expected to be sensitive to static discharge.

EXTINGUISHING MEDIA

Fire Extinguishing Media: Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog. Do not use water.

FIRE FIGHTING INSTRUCTIONS

Instructions to the Fire Fighters: Use water spray to cool fire-exposed containers or structures. Use water spray to disperse vapours. Isolate materials that are not involved in the fire and protect personnel. The heat from a fire can cause a build-up of pressure inside the containers which may rupture. Cool containers with flooding quantities of water until well after the fire is out. (4) Spilled acid may cause floors and contact surfaces to become slippery.

Fire Fighting Protective Equipment: Use self-contained breathing apparatus and protective clothing. Protective clothing for skin and eye protection should be worn to protect against corrosive materials.

6. ACCIDENTAL RELEASE MEASURES

Information in this section is for responding to spills, leaks or releases in order to prevent

or minimize the adverse effects on persons, property and the environment. There may be specific reporting requirements associated with spills, leaks or releases, which change from region to region.

Containment and Clean-Up Procedures: See Section 13, "Deactivating Chemicals". Wear protective clothing. Do not use combustible materials such as sawdust as an absorbent. Spilled acid may cause floors and contact surfaces to be come slippery. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment.

7. HANDLING AND STORAGE

HANDLING

Handling Practices: Use normal "good" industrial hygiene and housekeeping practices. Containers exposed to heat may be under internal pressure. These should be cooled and carefully vented before opening. A face shield and apron should be worn. When diluting, add this material/product to water in small amounts to avoid spattering. Never add water to this material/product.

Ventilation Requirements: See Section 8, "Engineering Controls".

Other Precautions: Use only with adequate ventilation and avoid breathing aerosols (vapours or mists). Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Do not use cutting or welding torches on empty drums that contained this material/product.

STORAGE

Storage Temperature (Deg Celsius): 10 to 27 Degrees Celsius.
Ventilation Requirements: Ventilation should be corrosion proof.

Storage Requirements: Store in a clean, cool well ventilated area, away from organic chemicals, strong bases, strong acids, metal powders, carbides, sulfides, and any readily oxidizable material. Protect from direct sunlight. Protect against physical damage. Storage tanks should be in a contained area to control any spills or leaks. Storage area should be equipped with acid-resistant floors, sumps and should have controlled drainage to a recovery tank. Do not store or transport with food or feed.

Special Materials to be Used for Packaging or Containers: Materials of construction for storing the product include: karbate, Teflon, Epoxy, ceramic, Pyrex, PVC, glass lined steel, rubber lined steel.

All metal equipment used to handle this acid must be lined with an appropriate protective material, such as rubber or certain plastics. (3) Attacks some types of rubber, plastics and coatings. Confirm suitability of any material before using.

Equipment for storage, handling or transportation should NOT be made of: nylon, zinc and its alloys, brass, galvanized iron, bronze, steel, mild steel, stainless steel, aluminum and copper and its alloys.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Recommendations listed in this section indicate the type of equipment, which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

ENGINEERING CONTROLS

Engineering Controls: Corrosion resistant explosion proof local exhaust is acceptable for laboratory use. Forced ventilation neutralizing scrubber is required when large amounts are used in manufacturing. Use only in closed systems which are corrosion resistant and

are verified as being free of air and moisture at all times (even when not in use). Pressure test and purge system prior to each use with inert gas. Air monitoring device is highly recommended. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense vapours may collect.

For personnel entry into confined spaces (i.e. bulk storage tanks) a proper procedure must be followed. It must include consideration of, among other things, ventilation, testing of tank atmosphere, provision and maintenance of SCBA, and emergency rescue. Use the "buddy" system. The second person should be in view and trained and equipped to execute a rescue. (4)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye Protection: Safety glasses with side shields are recommended to prevent eye contact. Use full face-shield and chemical safety goggles when there is potential for contact. Contact lenses should not be worn when working with this material.

Skin Protection: Gloves and protective clothing made from viton, teflon, PVC, neoprene, natural rubber, butyl rubber or nitrile rubber should be impervious under conditions of use. Attacks some types of rubber, plastics and coatings. Do not use gloves or protective clothing made from polyvinyl alcohol (PVA) Prior to use, user should confirm impermeability. Discard contaminated gloves.

Respiratory Protection: No specific guidelines available. A NIOSH/MSHA-approved full facepiece air-purifying respirator equipped with acid gas, dust, mist, fume cartridges for concentrations up to 20 ppm Hydrochloric Acid. An air-supplied respirator if concentrations are higher or unknown.

Immediately Dangerous to Life and Health (IDLH) value: 50 ppm The purpose of establishing an IDLH value is to ensure that the worker can escape from a given contaminated environment in the event of failure of the most protective respiratory equipment. In the event of failure of respiratory protective equipment, every effort should be made to exit immediately. (4)

If while wearing a respiratory protection, you can smell, taste or otherwise detect anything unusual, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator to face seal is still good. If it is, replace the filter, cartridge or canister. If the seal is no longer good, you may need a new respirator. (4)

Other Personal Protective Equipment: Wear an impermeable apron and boots. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact.

EXPOSURE GUIDELINES

	ACGIH TLV (STEL)	OSHA PEL (TWA)	(STEL)	NIOSH REL (TWA)	(STEL)
Hydrochloric Acid	2 ppm (Ceiling)	----	5 ppm (Ceiling)	----	5 ppm (Ceiling)

9. PHYSICAL AND CHEMICAL PROPERTIES (Not intended as Specifications)

Physical State: Liquid.
Appearance and Odour: Colourless to pale yellow liquid. Strong, pungent odour.
Odour Threshold (ppm): 0.3 to 5.0. (3)
Boiling Range (Deg Celsius): 85.
Melting/Freezing Point (Deg Celsius): -40.
Vapour Pressure (mm Hg at 20 Deg. Celsius): 20.
Vapour Density (Air = 1.0): 1.27 (Hydrogen Chloride).
Relative Density (g/cc): 1.16.
Bulk Density: 1,160 Kg/M3.
Viscosity: Not available.
Evaporation Rate (Butyl Acetate = 1.0): Below 1.
Solubility: Soluble in water. Hygroscopic (readily absorbs water).

% Volatile by Volume: 100.
pH: Below 1.
Coefficient of Water/Oil Distribution: Not available.
Volatile Organic Compounds (VOC): Not available.

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions: Stable.
Under Fire Conditions: Not flammable.
Hazardous Polymerization: Will not occur.

Conditions to Avoid: High temperatures, sparks, open flames and all other sources of ignition. Avoid contact with water.

Materials to Avoid: Strong oxidizers. Lewis or mineral acids. Sulphuric Acid. Ammonia. Strong bases. Combustibles. Amines. Organic materials. Reducing agents. Nylon. Metal Oxides. Carbonates. Cyanides. Sulfides. Metal Acetylides. Carbides. Phosphides Borides. silicides. Finely divided metals. Zinc and its alloys. Brass. Bronze. Galvanized iron. Metals. Alkali metals and their hydroxides. Alkanol amines. Corrosive to iron, steel, copper and their alloys. Hydrogen gas may be produced on prolonged contact with metals such as aluminum, tin, lead and zinc. (3) Epoxides. Aldehydes. Attacks some types of rubber, plastics and coatings.

Formaldehyde: Reaction with hydrochloric acid may form bis-chloromethyl ether. Bis-Chloromethyl ether is a suspected human carcinogen according to ACGIH (American Conference of Government Industrial Hygienists) and carcinogenic to humans according to IARC (International Agency for Research on Cancer).

Decomposition or Combustion Products: Chlorine and Hydrogen Chloride.

11. TOXICOLOGICAL INFORMATION

Toxicological Data:

Hydrochloric Acid	LC50 (Inhal'n, Rat, 4h)	=	1,562 ppm (1)
	LC50 (Inhal'n, Mouse, 4h)	=	554 - 757 ppm (1,3)
	LD50 (Oral, Rat)	=	900 - 1,300 mg/Kg (3)

Carcinogenicity Data: The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP.

Reproductive Data: No adverse reproductive effects are anticipated.

Mutagenicity Data: Hydrochloric Acid has demonstrated mutagenic activity in bacterial assay system. See "Other Studies Relevant to Material".

Teratogenicity Data: No adverse teratogenic effects are anticipated.

Respiratory / Skin Sensitization Data: None known.

Synergistic Materials: Reaction with hydrochloric acid and formaldehyde may form bis-chloromethyl ether. Bis-Chloromethyl ether is a suspected human carcinogen according to ACGIH and carcinogenic to humans according to IARC.

Other Studies Relevant to Material:

Application of a 1 % Hydrochloric Acid solution to the eyes of rabbits for 20 seconds caused corneal scarring. Other studies have reported that application of 5 mg for 30 seconds caused mild irritation and that application of a 5 % solution caused minimal irritation. Corrosive burns resulted when 0.5 ml of a 17 % concentrated solution was applied to rabbit skin for 4 hours. (4)

Mutagenic effects have been reported in one bacterial test, in three insect tests and in one in vitro mammalian cell test (Hamster lung cells). Hydrochloric Acid tested negative in another in vitro mammalian cell test (Syrian Hamster embryo cells). (4)

Epidemiological studies, which studied Hydrochloric Acid and risk of developing cancer, have observed excess lung cancers in workers exposed to Hydrochloric Acid. Increased risk of oat-cell carcinoma was also observed in workers exposed to Hydrochloric Acid. Male rats exposed to 10 ppm Hydrochloric Acid vapour / mists for 6 hours/day, 5 days/week, for their lifetimes showed no carcinogenic or chronic toxic effects. (4)

Female rats were exposed to 450 mg/M3 for 1 hour either prior to mating or on day 9 of pregnancy. Developmental effects were observed in the offspring. However, this exposure caused toxic effects, including mortality, to mothers. (4)

12. ECOLOGICAL INFORMATION

Ecotoxicity: Harmful to aquatic life at low concentrations. Toxicity is primarily associated with pH.

Hydrochloric Acid:

96-hour TLm = 282 ppm (Mosquito Fish, Fresh water). (3)
LC50 48-hour = 100 to 330 ppm (Shrimp, Salt water). (3)

Environmental Fate: Not available. Can be dangerous if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals: Neutralize carefully with soda ash or sodium bicarbonate to a pH of 6 to 9. Neutralization is expected to be exothermic. Effervescence may result.

Waste Disposal Methods: This information applies to the material as manufactured. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.

Safe Handling of Residues: See "Disposal of Packaging".

Disposal of Packaging: See above, "Deactivating Chemicals". Empty containers retain product residue and can be dangerous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Do not expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death. Do not dispose of package until thoroughly washed out.

14. TRANSPORTATION INFORMATION

Please consult the North American Emergency Guidebook, via the UN#, for guidance on addressing spills.

CANADIAN TDG ACT SHIPPING DESCRIPTION:

Hydrochloric Acid Solution, Class 8, UN1789, Pk Gp II.
Label(s)/Placard(s): Corrosive.
ERAP Index: Hydrochloric Acid: Greater than 3,000 Kg.
Exemptions: Not available.

US DOT CLASSIFICATION (49CFR 172.101, 172.102):

Hydrochloric Acid Solution, Class 8, UN1789, Pk Gp II.
Label(s)/Placard(s): Corrosive.
Reportable Quantity (CERCLA-RQ): 5000 lbs / 2270 kg. Exemptions: Not available.

15. REGULATORY INFORMATION

CANADA

CEPA - NSNR: This material is included on the DSL under the CEPA.

CEPA - NPRI: Hydrochloric Acid.
Controlled Products Regulations Classification (WHMIS): D-1A: Very Toxic (acute effects),
E: Corrosive.

USA

Environmental Protection Act: This material is included on the TSCA Inventory.
OSHA Hazard Communication (29CFR 1910.1200) Classification: Highly Toxic, Corrosive.

HMIS: 3 Health, 0 Fire, 1 Reactivity. (3)

INTERNATIONAL: Hydrochloric Acid is found on the following inventories: EINECS (European Inventory of Existing Commercial Chemical Substances), ACOIN (Australia), MITI (Japan) and Korea.

16. OTHER INFORMATION

ADDITIONAL INFORMATION AND SOURCES USED

The Baume Scale:

% HCl	Specific Gravity at 15 Degrees Celsius	Degrees Baume (3)
10.17	1.0507	7.0
12.09	1.0584	8.0
13.65	1.0662	9.0
14.83	1.0741	10.0
16.41	1.0821	11.0
18.01	1.0902	12.0
19.63	1.0985	13.0
21.27	1.1069	14.0
22.92	1.1154	15.0
24.57	1.1240	16.0
26.22	1.1328	17.0
27.92	1.1417	18.0
29.65	1.1508	19.0

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1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database.
 2. Clayton, G.D. and Clayton, F.E., Eds., Patty's Industrial Hygiene and Toxicology, 3rd ed., Vol. IIA,B,C, John Wiley and Sons, New York, 1981.
 3. Supplier's Material Safety Data Sheet(s).
 4. "CHEMINFO", through "CCINFODisc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada.
 5. Guide to Occupational Exposure Values, 2002, American Conference of Governmental Industrial Hygienists, Cincinnati, 2002.

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Brenntag Canada Inc. will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years.

To obtain revised copies of this or other Material Safety Data Sheets, contact your nearest Brenntag Canada Regional office.

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Page 9

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