SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifier

Product name: **Muriatic Acid**
SDS number: CR.MA
Synonym(s): HCl; Hydrochloric acid; Hydrogen chloride aqueous solution

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

General use: For industrial and laboratory use only; use only in well ventilated areas
Uses advised against: No data available

1.3 Details of the supplier and of the safety data sheet

Manufacturer/Distributor
SolvChem Consumer Products
1904 Mykawa Road
Pearland, TX 77581-3210 USA
1-281-485-1458

1.4 Emergency telephone number

CHEMTREC: 1-800-424-9300 (USA)
CANUTEC: 1-613-996-6666 (Canada)

SECTION 2 - HAZARDS IDENTIFICATION

2.1 Classification of substance or mixture

Product definition: Mixture
Classification in accordance with 29 CFR 1910 (OSHA HCS) and Regulation EC No. 1272/2008
Skin Corrosion - Category 1B [H314]
Specific Target Organ Toxicity - Single Exposure - Category 3; STOT SE 3 [H335]

2.2 Label elements

Hazard symbol(s):


GHS05


GHS07

Signal word: Danger

Hazard statement(s):
H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation

Precautionary statements:

[Prevention]
P260 - Do not breathe mist and vapor.
P264 - Wash hands and other exposed skin areas thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P280 - Wear protective gloves, protective clothing and eye protection.

[Response]
P301 + P330 + P331 + P310 - IF SWALLOWED: Rinse mouth. DO NOT induce vomiting. Immediately call a POISON CENTER or doctor.
P303 + P361 + P353 - IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water or shower.
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 doctor.
P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
P321 - Specific treatment: Immediately contact a POISON CENTER or doctor. Refer to Section 4 of this SDS.
P363 - Wash contaminated clothing before reuse.

[Storage]
P405 + P403 + P233 - Store locked up in a well-ventilated place. Keep container tightly closed.

[Disposal]
P501 - Dispose of contents and containers in accordance with national and local regulations.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

May be corrosive to metals.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable

3.2 Mixtures

% by Weight	Ingredient	CAS Number	EC Number	Index Number	GHS Classification
25 - 35	Hydrochloric acid	7647-01-0	231-595-7	017-002-01-X	H314, H335

As per paragraph (i) of 29 CFR 1910.1200, formulation is considered a trade secret and specific chemical identity and exact percentage (concentration) of composition may have been withheld. Specific chemical identity and exact percentage composition will be provided to health professionals, employees, or designated representatives in accordance with the applicable provisions of paragraph (i).

There are no additional ingredients present in this product 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.

SECTION 4 – FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation: If breathing is difficult or irregular, administer oxygen; if respiratory arrest occurs, start artificial respiration by trained personnel. Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. If unconscious, maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

Eyes: Immediately flush eyes with large amounts of water or saline solution for at least 15 minutes, occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do after first 2 minutes and continue rinsing. Seek immediate medical attention, preferably from an ophthalmologist.

Skin: Flush skin with large amounts of water while removing contaminated clothing and continue rinsing for at least 15 minutes. Wash contaminated clothing thoroughly before reuse. Discard contaminated shoes. Seek immediate medical attention for chemical burns.

Ingestion: Rinse mouth with water if the victim is conscious. Remove dentures if present. Give 2 glasses of water or milk to drink if the victim is conscious, alert and able to swallow. DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious or convulsing person. Do not leave the victim unattended. Seek immediate medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Potential health symptoms and effects

Eyes: Causes severe burns and serious eye damage. Symptoms include inflammation, swelling, pain, tearing, burns and vision impairment. Can cause ulceration, conjunctival irritation, corneal damage, permanent eye damage and blindness. Mist or vapor can cause severe eye irritation and eye damage.

Skin: Corrosive to skin! Causes severe skin burns and tissue damage. Symptoms include localized redness, blistering, itching and severe pain. Contact with skin may cause ulceration and possible scarring. Harmful if absorbed through the skin.

Inhalation: Harmful, possibly fatal, if inhaled. Causes severe irritation and chemical burns to the respiratory tract. Symptoms include runny nose, burning sensation, sore throat, wheezing, cough, chest tightness, shortness of breath, severe chest pain and spasms. May damage to the mucous membranes and respiratory system. May cause choking, coughing up blood, weakness, dizziness, rapid pulse, low blood pressure and shock. Exposure may lead to inflammation and edema of the larynx and bronchi, pneumonitis, pulmonary edema, delayed lung edema and dental erosion. Severe overexposure may cause cyanosis, circulatory collapse and respiratory arrest. Effects may be delayed. Exposure could cause asphyxiation due to swelling in the throat. Severe over-exposure can result in death.

Ingestion: Harmful if swallowed. Causes burns to the lips, mouth, throat and gastrointestinal tract. Causes severe pain, salivation, nausea, vomiting (possibly bloody), diarrhea, shock and possible death. May cause severe and permanent damage to the digestive tract. May cause perforation of the esophagus and stomach. Uptake of large quantities may cause cyanosis, circulatory collapse and respiratory arrest. Effects may be delayed.

Chronic: Chronic occupational exposure to hydrochloric acid has been reported to cause gastritis, chronic bronchitis, dermatitis, and photosensitization in workers. Prolonged exposure to low concentrations may also cause dental discoloration and erosion. Chronic inhalation exposure to mist or vapor may result in decreased pulmonary function, inflammation of the bronchi and nasal ulceration. Repeated exposure to low concentrations of vapor or mist may cause bleeding of nose and gums. Chronic exposure to high concentrations may result in corneal necrosis, cataracts and glaucoma.

4.3 Indication of any immediate medical attention and special treatment needed

Advice to doctor and hospital personnel

Treat symptomatically and supportively.

SECTION 5 – FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable methods of extinction: Use extinguishing media suitable for the surrounding fire.
Unsuitable methods of extinction: None known

5.2 Special hazards arising from the substance or mixture

Hydrochloric acid solutions are non-flammable and non-combustible. However, on contact with most metals flammable hydrogen gas is liberated, which is explosive when confined. Closed containers may rupture due to the buildup of pressure when exposed to extreme heat. During emergency conditions overexposure to decomposition products may cause a health hazard. Symptoms may not be immediately apparent or may be delayed. Obtain medical attention.

Explosion hazards: This product is not considered an explosion hazard.

5.3 Advice to firefighters

Full protective equipment including self-contained breathing apparatus should be used. Water may be used to cool closed containers to prevent pressure buildup and possible autoignition or explosion when exposed to extreme heat. Water contaminated by this material must be contained from being discharged to any waterway, sewer or drain to prevent environmental contamination.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate non-essential personnel. Wear appropriate protective clothing and equipment, including respiratory protection, designated in Section 8.2. Ventilate the area. Remove all sources of ignition. NO SMOKING. Clean up spills immediately. Spill creates a slip hazard.

6.2 Environmental precautions

Avoid dispersal of spilled material or runoff and prevent contact with soil and entry into drains, sewers or waterways. Use water sparingly to minimize environmental contamination and reduce disposal requirements.

6.3 Methods and materials for containment and cleaning up

Approach spill from upwind direction. DO NOT FLUSH SPILL DOWN THE DRAIN. Cover drains and contain spill. Cover spill with a large quantity of inert absorbent. Do not use combustible material such as sawdust. Collect product using non-sparking tools and place into an approved container for proper disposal. DO NOT use a metal container for disposal. Observe possible material restrictions (Sections 7.2 and 10.5). Contaminated absorbent may pose the same hazard as the spilled product. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other sections

For indications about waste treatment, see Section 13.

SECTION 7 – STORAGE AND HANDLING

7.1 Precautions for safe handling

Wear all appropriate personal protective equipment, including respiratory protection, specified in Section 8.2. Do not get in eyes or on skin or clothing. Do not inhale mist or vapor. NO SMOKING. Use caution when opening containers. Normal use of material can present a respiratory hazard; use only adequate ventilation or wear an appropriate respirator. Wash contaminated clothing before reuse. Discard contaminated shoes.

Advice on protection against fire and explosion

Keep away from heat and incompatible materials. Hydrochloric acid solutions are non-flammable and non-combustible. However, on contact with most metals flammable hydrogen gas is liberated, which is explosive when confined.

7.2 Conditions for safe storage, including any incompatibilities

Store in the original container in dry, cool, well-ventilated areas away from incompatible materials (see Section 10.5), food and drink. Keep away from strong bases and metals. Transfer only to approved containers having correct labeling. DO NOT store in metal containers. Keep containers tightly closed when not in use. Protect containers against physical damage. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Containers are hazardous when empty as they contain product residue. Use appropriate containment to avoid environmental contamination. Ventilate closed areas. Keep locked up and out of reach of children.

7.3 Specific end uses

Apart from the uses mentioned in Section 1.2, no other specific uses are stipulated.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Occupational exposure limit values

CAS Number	Ingredient	OSHA PEL	ACGIH TLV	NIOSH
7647-01-0	Hydrochloric Acid	5 ppm; 7 mg/m^3, ceiling	2 ppm, ceiling	5 ppm; 7 mg/m^3, ceiling 50 ppm IDLH

8.2 Exposure controls

Engineering measures: Technical measures and appropriate working operations should be given priority over the use of personal protective equipment. Use adequate ventilation. Local exhaust is preferable. Material should be used under a hood in the laboratory. Refer to Section 7.1.

Individual protection measures: Wear protective clothing to prevent repeated or prolonged contact with product. Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the representative supplier.

Hygiene measures: Facilities storing or using this material should be equipped with an eyewash station and safety shower. Change contaminated clothing. Preventive skin protection is recommended. Wash hands thoroughly after use, before eating, drinking, smoking or using the lavatory.

Eye/face protection: Wear protective splash goggles or safety glasses with unperforated side shields and a face shield during use.

Hand protection: Wear gloves made of Nitrile rubber, Neoprene or those recommenced by glove supplier for protection against materials in Section 3. Gloves should be impermeable to chemicals and oil. Breakthrough time of selected gloves must be greater than the intended use period.

Skin protection: Wear protective clothing. Wear protective boots if the situation requires.

Respiratory protection: It is recommended that this material be used under a hood in the lab or for workers to wear an approved respirator when handling this material. Always use an approved respirator when vapor/aerosols exceed permissible exposure limits. Where risk assessment shows air-purifying respirators are appropriate use a half-mask respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Follow OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149.

Environmental exposure controls: Do not empty into drains.

PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean fit and use. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers to ensure adequate protection

** It is recommended that a face shield be worn with splash goggles when handling this product.*

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	Clear, colorless to light amber liquid
Odor	Pungent, characteristic
Odor Threshold	0.3 - 14.9 mg/m^3
Molecular Weight	36.46 g/mol (HCl)
Chemical Formula	HCl
pH	< 1 @ 20 °C
Freezing/Melting Point	No data available
Initial Boiling Point	100 °C (212 °F) [literature]
Evaporation Rate	No data available
Flammability (solid, gas)	Not applicable
Flash Point	No data available
Autoignition Temperature	No data available
Decomposition Temperature	No data available
Lower Explosive Limit (LEL)	No data available
Upper Explosive Limit (UEL)	No data available
Vapor Pressure	No data available
Vapor Density	No data available
Specific Gravity	1.05 - 1.07 [calculated]
Density	1.05 - 1.07 g/ml (8.76 - 8.93 lb/gal) [calculated]
Viscosity	No data available
Solubility in Water	Soluble
Partition Coefficient (n-octanol/water)	Not applicable
Oxidizing Properties	Not applicable
Explosive Properties	Not applicable
Volatiles by Weight @ 21 °C	No data available

9.2 Other Data

May be corrosive to metals

SECTION 10 – STABILITY AND REACTIVITY

10.1 Reactivity

This material is stable under normal handling conditions and use.

10.2 Chemical Stability

This material is stable under recommended storage and handling conditions.

10.3 Possibility of hazardous reactions

Generates hydrogen gas on contact with metals. Hazardous polymerization will not occur.

10.4 Conditions to avoid

Heat, sources of ignition, contact with incompatible materials, contact with metals

10.5 Incompatible materials

Strong oxidizing agents, metals, bases, amines, alkali metals, permanganates, fluorine, metal acetylides

10.6 Hazardous decomposition products

Thermal decomposition products include oxides of carbon, hydrogen gas and irritating and toxic fumes.

SECTION 11 – TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute oral toxicity

LD_{50}, rat: 238 - 277 mg/kg [hydrogen chloride]

Acute inhalation toxicity

LC_{50}, rat: 1.68 mg/l, 1 h [hydrogen chloride]

Acute dermal toxicity
LC_{50}, rabbit: > 5,010 mg/kg [hydrogen chloride]

Skin irritation
Causes severe skin burns and serious skin irritation.

Eye irritation
Causes burns and serious eye damage. Risk of blindness!

Sensitization
No data available

Genotoxicity in vitro
No data available

Mutagenicity
No data available

Specific organ toxicity - single exposure
May cause respiratory irritation.

Specific organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Further information

Hydrochloric Acid (CAS #7647-01-1): IARC Group 3 carcinogen - *Not classifiable as to its carcinogenicity to humans*. Not listed as a carcinogen by ACGIH, IARC, NTP or OSHA.

Chronic inhalation exposure caused hyperplasia of the nasal mucosa, larynx and trachea and lesions in the nasal cavity in rats. In rats exposed to hydrochloric acid by inhalation, severe dyspnea, cyanosis and altered estrus cycles have been reported in females and increased fetal mortality and decreased fetal weight have been reported in the offspring.

No definitive data is available regarding the mutagenicity or teratogenicity of this product, nor is there any available data that indicates it causes adverse developmental or fertility effects.

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12 - ECOLOGICAL INFORMATION

12.1 Toxicity

Large discharges or spills of Hydrochloric Acid may decrease the pH of aquatic systems to a value <2, which can be fatal to aquatic life and soil micro-organisms.

Acute toxicity to fish: LC_{50} - Gambusia affinis (Mosquito fish), 96 h: 282 mg/l

12.2 Persistence and degradability

Inorganic substances are not biodegradable. Methods for the determination of biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulation potential

This material will not bioaccumulate.

12.4 Mobility in soil

This material has high mobility in soil. Hydrochloric acid exhibits extensive evaporation from soil surfaces. Upon transport through the soil, hydrochloric acid will dissolve some of the soil materials, especially those that are carbonate-based, and the acid will neutralize to some degree.

12.5 Results of PBT and vPvB assessment

This material does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

12.6 Other effects

Additional ecological information
Do not allow material to run into surface waters, wastewater or soil.
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

SECTION 13 – DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Methods of disposal: The generation of waste should be avoided or minimized whenever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. 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. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

RCRA F-Series: No listings above the reportable threshold (de minimis)
RCRA U-Series: No listings above the reportable threshold (de minimis)

SECTION 14 – TRANSPORTATION INFORMATION

Note: Transportation information provided is for reference only. Customer is urged to consult 49 CFR 100 - 177, IMDG, IATA, EC, United Nations TDG and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

Limited quantity for corrosive liquids in Packing Group II when inner packagings are not over 1.0 liters (0.3 gallons) net capacity each, packed in a strong outer packaging.

USA DOT (Ground Transportation) - Bulk and Non-bulk

Proper Shipping Name	Hydrochloric Acid
Hazard Class	8
UN/NA	UN1789
Packing Group	II
NEAREG	Guide #157
Packaging Authorization	Non-Bulk: 49 CFR 173.202; Bulk: 173.242
Packaging Exceptions	49 CFR 173.154

Drum Label(s)

IMO/IMDG (Water Transportation)

Proper Shipping Name	Hydrochloric Acid
Hazard Class	8
UN/NA	UN1789
Packing Group	II
Marine Pollutant	No
EMS Number	F-E, S-B

ICAO/IATA (Air Transportation)

Proper Shipping Name	Hydrochloric Acid
Hazard Class	8
UN/NA	UN1789
Packing Group	II
Quantity Limitations	49 CFR 175.27 and 175.75 - Cargo Aircraft Only: 30 l; Passenger Aircraft: 1 l

RID/ADR (Rail Transportation)

Proper Shipping Name	Hydrochloric Acid
Hazard Class	8
UN/NA	UN1789
Packing Group	II

SECTION 15 - REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for substance or mixture

U. S. Federal Regulations

OSHA Hazard Communication Standard: This material is classified as hazardous in accordance with OSHA 29 CFR 1910-1200.

OSHA Process Safety Management Standard: Hydrochloric Acid (CAS #7647-01-0) is regulated under OSHA PSM Standard 29 CFR 1910.119.

EPA Risk Management Planning Standard: Hydrochloric Acid (CAS #7647-01-0) is regulated under EPA RMP Standard (RMP) 40 CFR Part 68.

EPA Federal Insecticide, Fungicide and Rodenticide Act: This product is not a registered Pesticide under the FIFRA, 40 CFR Part 150.

Toxic Substance Control Act (TSCA) Inventory: All substances in this product are listed on the TSCA Inventory. This product is not subject to TSCA 12(b) Export Notification.

Drug Enforcement Administration (DEA) List 2, Essential Chemicals (21 CFR 1310.02(b)) and 1310.4(f)(2)) and Chemical Code Number: No listings

Drug Enforcement Administration (DEA) Lists 1 & 2, Exempt Chemical Mixtures (21 CFR 1310.12(c)) and Code Number: No listings

Department of Homeland Security (DHS) Chemical Facility Anti-Terrorism Standards (CFATS) Chemicals: No listings

Superfund Amendments and Reauthorization Act (SARA)
SARA Section 311/312 Hazard Categories: Causes severe skin burns and eye damage May cause respiratory irritation

SARA 313 Information: None of the components of the product exceed the threshold (de minimis) reporting requirements of Section 313 of the Emergency Planning and Community Right-to Know Act of 1986.

SARA 302/304 Extremely Hazardous Substance: None of the components of the product exceed the threshold (de minimis) reporting levels of established by these sections of Title III of SARA.

SARA 302/304 Emergency Planning & Notification: None of the components of the product exceed the threshold (de minimis) reporting levels established by of these sections of Title III of SARA.

Comprehensive Response Compensation and Liability Act (CERCLA): This product contains the following CERCLA reportable substance: Hydrochloric Acid (CAS #7647-01-0): RQ = 2,267.96 kg (5,000 lb)

This product has a Reportable Quantity (RQ) of 18,868.30 lb. (1,884.1 gal) based on the RQ for Hydrochloric Acid of 5,000 lb. Releases above

the RQ must be reported to the National Response Center. Many states have more stringent release reporting requirements. Report spills required under federal, state and local regulations.

Clean Air Act (CAA)
Hydrochloric Acid (CAS #7647-01-0) is Hazardous Air Pollutant (HAP) designated in CAA Section 112 (b).
This product does not contain Class 1 Ozone depletors.
This product does not contain Class 2 Ozone depletors.

Clean Water Act (CWA)
Hydrochloric Acid (CAS #7647-01-0) is a Hazardous Substance under the CWA.
This product does not contain Priority Pollutants.
This product does not contain Toxic Pollutants.

U.S. State Regulations

California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986
This product contains no chemical(s) known to the state of California to cause cancer birth defects or reproductive harm in concentrations that exceed the threshold (de minimis) reporting levels established under Proposition 65.

Other U.S. State Inventories
Hydrochloric Acid (CAS #7647-01-0) is listed on the following State Hazardous Substance Inventories, Right-to-Know lists and/or Air Quality/Air Pollutants lists: CA, DE, ID, IL, ME, MA, MN, NC, NJ, NY, PA, RI, WA, WI.

Canada

WHMIS Hazard Classification
Causes severe skin burns and eye damage Toxic if inhaled Causes severe damage to the respiratory tract

Canadian National Pollutant Release Inventory (NPRI): Hydrochloric Acid (CAS #7647-01-0) is listed on the NPRI.

European Economic Community
WGK, Germany (Water danger/protection): 1 (slightly hazard to waters)

Global Chemical Inventory Lists

Country	Inventory Name	Listed
Canada	Domestic Substance List (DSL)	Yes
Canada	Non-Domestic Substance List (NDSL)	No
Europe	Inventory of New and Existing Chemicals (EINECS)	Yes
United States	Toxic Substance Control Act (TSCA)	Yes
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
New Zealand	New Zealand Inventory of Chemicals (NZIoC)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (KECI)	Yes
Philippines	Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Yes

*Yes - All components of this product comply with the inventory requirements administered by the governing country.
No - One or more components of this product are not on the inventory or are exempt from listing.

15.2 Chemical safety assessment
For this product a chemical safety assessment was not carried out.

SECTION 16 - OTHER INFORMATION

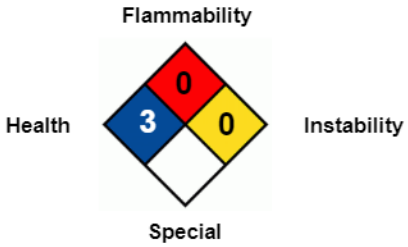
Hazardous Material Information System (HMIS)

H = splash goggles, gloves, apron & vapor respirator

HMIS Hazard Rating Legend
0 = Minimal 1 = Slight 2 = Moderate
3 = Serious 4 = Severe
* = Chronic Health Hazard

NFPA Hazard Rating Legend
0 = Insignificant 1 = Slight 2 = Moderate
3 = High 4 = Extreme

National Fire Protection Association (NFPA)



Abbreviation Key

ACGIH	American Conference of Governmental Industrial Hygienists	**LD_{Lo}**	Lowest Lethal Dose
ADR	Accord Dangereux Routier (European regulations concerning the international transport of dangerous goods by road)	**mppcf**	Millions of Particles Per Cubic Foot
CAS	Chemical Abstract Services	**NA**	North America
CFR	Code of Federal Regulations	**NAERG**	North American Emergency Response Guide Book
COC	Cleveland Open Cup	**NIOSH**	National Institute for Occupational Safety & Health
DOT	Department of Transportation	**NTP**	National Toxicology Program
EC50	Half maximal effective concentration	**OSHA**	Occupational Safety and Health Administration

EMS	Emergency Response Procedures for Ships Carrying	**PBT**	Persistent, Bioaccumulating and Toxic
EPA	Environmental Protection Agency	**PEL**	Permissible exposure limit
ErC_{50}	Reduction of Growth Rate	**PMCC**	Pensky-Martens Closed Cup
ERG	Emergency Response Guide Book	**ppm**	Parts Per Million
FDA	Food and Drug Administration	**RCRA**	Resource Conservation and Recovery Act
GHS	Globally Harmonized System of Classification and Labelling of Chemicals (GHS)	**RID**	Dangerous Goods by Rail
HCS	Hazard Communication Standard	**RQ**	Reportable Quantity
IARC	International Agency for Research on Cancer	**TCC/Tag**	Tagliabue Closed Cup
IATA	International Air Transport Association	**TLV**	Threshold Limit Value
IC_{50}	Half Maximal Inhibitory Concentration	**TSCA**	Toxic Substance Control Act
ICAO	International Civil Aviation Organization	**TWA**	Time-weighted Average
IDLH	Immediately Dangerous to Life and Health	**UN**	United Nations
IMDG	International Maritime Dangerous Goods	**VOC**	Volatile Organic Compounds
IMO	International Maritime Organization	**vPvB**	Very Persistent and Very Bioaccumulating
LC_{50}	50% Lethal Concentration	**WHMIS**	Workplace Hazardous Materials Information System
LD_{50}	50% Lethal Dose		

DISCLAIMER OF RESPONSIBILITY

The information on this SDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented, and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume damage or expense arising out of or in any way responsibility and expressly disclaim liability for loss, connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this SDS information may not be applicable.

Revision Date: 05 March 2021, Version 3
Supersedes SDS: 04 February 2015, Version 2

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