

# Material Safety Data Sheet

## PERCHLORIC ACID

Print Date: March 2004

### SECTION 1 – Chemical Product and Company Identification

**MSDS Name:** PERCHLORIC ACID

**MSDS Preparation Date:** 02-2004, Supersedes 02-2001, 02-98

**Synonyms or Generic ID:** Dioxonium Perchlorate, Hydronium Perchlorate.

**Seastar Product Codes:** IQ-02-0500, IQ-02-2500, IQ-02-2500ACS, IQ-02-2500-6, IQ-02-2500-S, IQ-02-25SK, IQ-02-25SK6, IQ-02-25SK-S, BA-02-0250, BA-02-0500, BA-02-1000, BA-02-2000, 70%PERCHLORIC

**Canadian TDG Classification** 5.1 (8) PKG Gr I

**Formula:** HClO<sub>4</sub>

**PIN (UN# / NA#):** UN1873

**Molecular Wt:** 100.46

**Canadian WHMIS Class:** Class E, Class C, Class F

**Supplier:** Seastar Chemicals Inc, PO Box 2219, 2045 Mills Road West, Sidney, BC, Canada V8L 3S8

Tel: (250) 655-5880, Fax: (250) 655-5888

**CANUTEC (CAN):** (613)-996-6666

### SECTION 2 – Composition/Information on Ingredients

CAS #	Chemical Name	Percent	EINECS/ELINCS	TLV	Hazard
7601-90-3	Perchloric Acid	60-72%	None listed	Not established	Oxidizer/Corrosive
7732-18-5	Water	Balance	None	None	None

Hazard Symbols: O C

Risk Phrases: 35 5 8

### SECTION 3 – Hazards Identification

#### EMERGENCY OVERVIEW

Colourless, oily, odourless liquid. Concentrated acid is very hygroscopic (absorb moisture from the air). Will not burn. Concentrated acid can decompose at high temperatures forming corrosive gases such as chlorine, hydrogen chloride and chlorine dioxide. MILD to STRONG OXIDIZING AGENT, depending on concentration of the solution and temperature. Promotes combustion. Contact with combustible or flammable materials can cause fire or explosion. Can react violently or explosively with many organic and inorganic chemicals. Vapours or mists are severely irritating to the respiratory tract. CORROSIVE to the eyes and skin. May cause blindness, severe burns and permanent scarring.

Target Organs: Eyes, thyroid, skin, mucous membranes.

#### Potential Health Effects

**Primary Route(s) of Entry:** Inhalation and ingestion. Skin contact. Eye contact.

**Effects of Acute Exposure:** Corrosive to skin and mucous membranes. Irritant.

#### LD50/LC50:

CAS# 7601-90-3: Oral, rat: LD50 – 1100 mg/kg.

CAS# 7732-18-5: Oral, rat: LD50 = >90 ml/kg

**Eyes:** Causes eye burns. Chronic effects. May cause severe burns and loss of vision. Causes irritation.

**Skin:** Causes skin burns. May be fatal if inhaled, or swallowed, or absorbed through skin. Causes severe burns. Destructive to tissue of mucous membranes.

**Ingestion:** Causes burns in mouth, pharynx and gastrointestinal tract.

**Inhalation:** May cause severe irritation of the respiratory tract with sore throat, coughing, shortness of breath and delayed lung edema. May cause respiratory inflammation. Headache, Vomiting, Causes nausea, Reduced pulse rate and blood pressure.

**Effects of Chronic Exposure:** Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and bronchitis. Prolonged or repeated eye contact may cause conjunctivitis. Prolonged or repeated skin contact may cause sensitization dermatitis and possible destruction and/or ulceration. Chronic ingestion may cause effects similar to those of acute ingestion.

## SECTION 4 – First Aid Measures

**Eyes:** Immediately flush eyes and skin with copious amounts of water for at least 15 minutes, holding lids apart to ensure flushing of the entire surface. Get medical aid immediately.

**Skin:** Get medical aid immediately. Immediately flush skin with copious quantities of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician.

**Ingestion:** Do NOT induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Consult a physician immediately. Never give anything by mouth to an unconscious person.

**Inhalation:** Remove patient from exposure to fresh air. Administer approved oxygen supply if breathing is difficult. Administer artificial respiration or CPR if breathing has ceased. Call a physician.

**Notes to Physician:** Treat symptomatically and supportively.

## SECTION 5 – Fire Fighting Measures

**General Information:** Strong oxidizer. Contact with combustible materials may cause a fire. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products.

**Extinguishing Media:** Use water spray to cool fire-exposed containers. Use extinguishing media most appropriate for the surrounding fire. Dry chemical. Self-contained breathing apparatus with a full facepiece operated in a pressure demand or other positive pressure mode.

**Auto-ignition Temperature:** Not applicable.

**Flash Point:** Not applicable.

**NFPA Rating:** Health - 3; Fire - 0; Instability - 3; Other – Oxidizing Material.

**Explosion Limits:** Lower: None available. Upper: None available.

**Special Fire and Explosion Hazards:** Oxidizing material – contributes to combustion of other materials. Avoid contact with organic substances.

## SECTION 6 – Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spills/Leaks:** Cover with sand, dry lime or soda ash, and place in a closed container for disposal.

**Steps to be taken in case material is released or spilled:** Small Spill: Perchloric acid is best disposed of by stirring it gradually into enough cold water to make its concentration less than 0.1%, neutralizing it with aqueous sodium hydroxide and washing the solution down the drain with at least 50 times its volume of water. See below.

Large Spill: Add weak reducing agent (e.g., Ferrous salts) to spill. Shovel sludge into large container of water and add soda lime to neutralize.

**Waste disposal method:** Small Spill: According to all applicable regulations. Large Spill: According to all applicable regulations.

## SECTION 7 – Handling and Storage

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before re-use. Use with adequate ventilation. Avoid contact with clothing and other combustible materials. Do not get on skin or in eyes. Do not ingest or inhale. Use with adequate ventilation.

**Storage:** Do not store near combustible materials. Store in a cool, dry place away from sparks and flame. Store in a tightly closed container. Do not add any other material to the container. Do not store near flammable substances. In accordance with good storage and handling practices. Do not allow smoking or food consumption while handling. Do not store near organic substances. Do not get in eyes, on skin, or on clothing. Wash well after use. Product is highly hygroscopic. Wash thoroughly with water before marking “empty”.

**Storage Code:** Yellow.

## SECTION 8 – Exposure Control/Personal Protection

**Engineering Controls:** Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

**Exposure Limits:**

<b>Chemical Name</b>	<b>ACGH</b>	<b>NIOSH</b>	<b>OSHA</b>
Perchloric acid	None listed.	None listed.	None listed.
Water	None listed.	None listed.	None listed.

OSHA Vacated PELs

**Personal Protective Equipment**

**Eyes:** Wear appropriate protective face shield and eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133.

**Skin:** Wear appropriate protective neoprene or polyethylene gloves to prevent skin exposure. Apron or clothing to protect skin. Rubber boots.

**Clothing:** Wear appropriate protective clothing to minimize contact with skin.

**Respiratory Protection:** Follow the OSHA respirator regulations found in 29CFR 1910.134. Always use a NIOSH-approved respirator when necessary. Less than ppm – chemical cartridge respirator. Guard against aspiration into lungs.

**Ventilation:** Adequate ventilation to maintain air below ppm. Use chemical fume hood.

**Other Protective Equipment:** Make eye bath and emergency shower available.

## SECTION 9 – Physical and Chemical Properties

**Physical State:** Liquid

**Appearance:** clear, colorless

**Odor:** odorless, to slight chlorine smell

**pH:** Acidic

**Vapor Pressure:** 6.8 mm at 25°C

**Vapor Density:** 3.46

**Evaporation Rate:** No information available.

**Viscosity:** No information available.

**Boiling Point:** 203°C

**Freezing/Melting Point:** -20°C

**Decomposition Temperature:** No information available.

**Solubility:** Soluble in water.

**Specific Gravity/Density:** 1.7

**Molecular Formula:** HClO<sub>4</sub>

**Molecular Weight:** 100.4576

## SECTION 10 – Stability and Reactivity

**Chemical Stability:** Combines vigorously with water with the evolution of heat. May undergo spontaneous and explosive decomposition. This material is a strongly acidic, powerful oxidizing substance. The anhydrous form of this material is an explosion hazard.

**Conditions to Avoid:** Incompatible materials, excess heat, combustible materials, organic materials, reducing agents, temperatures above 200°C, alkaline materials, heating to decomposition, dehydrating agents.

**Incompatibilities with Other Materials:** Acetic acid, acetic anhydride, acetonitrile, acids, acetate, alcohols, alkyl ethers, alkyl sulfoxides, aniline and formaldehyde, aniline, antimony compounds (trivalent), azo-pigment and orthoperiodic acid, BIS (2-hydroxyethyl) terephthalate, bismuth, carbon, cellulose and derivatives, charcoal, combustible materials, copper dichromium tetraoxide, dehydrating agents, dichloromethane, diethyl ether, dibutyl sulfoxide, dimethyl sulfoxide, dioxane, ethylbenzene, fluorine, glycerine/glycerol and lead oxide, glycols, glycols and their ethers, graphitic carbon, hydriotic acid, hydrochloric acid, hydrofluoric acid, hydrogen, hydrogen halides, hypophosphites, iodides, iron (II) sulfate, ketones, metal oxides, methyl alcohol, 2-methylpropene, nitric acid, nitric acid and sulfuric acid with pyridine, nitrogen iodide, nitrosophenol, oleic acid, organic materials, paper, phenylacetylene, phosphine, phosphorus pentoxide, phosphorus pentoxide and chloroform, pyridine, sodium iodide, sodium phosphinate, steel, sulfinyl chloride, sulfoxides, sulfuric acid, sulfur trioxide, trichloroethylene, trimethylplatinum hydroxide, wood, zinc phosphide. May react violently or explosively with many of these compounds. Flammable, combustible, organic, dehydrating, oxidizing and reducing materials. Bases.

**Hazardous Decomposition Products:** Chlorine dioxide, which may be spontaneously explosive. Hydrogen chloride gas and chlorine dioxide gas.

**Hazardous Polymerization:** Has not been reported.

Avoid CONTACT WITH organic materials, strong dehydrating materials. Avoid contact with material. Reacts with wood products and metal powders. HYGROSCOPIC LIQUID. HIGHLY CORROSIVE. OXIDIZER. KEEP FROM FREEZING AND DEHYDRATING.

NFPA Hazard Rating; Health – 3; Flammability – 0; Reactivity – 3, Other - OXY.

## SECTION 11 – Toxicological Information

**RTECS:** CAS# 7601-90-3: SC7500000. CAS# 7732-18-5: ZC0110000.

**LD50/LC50:** CAS# 7601-90-3 Oral, rat: LD50 = 1100 mg/kg. CAS# 7732-18-5: ZC0110000. Oral, rat: LD50 = >90 mL/kg

**Carcinogenicity:** CAS# 7601-90-3: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.

CAS# 7732-18-5: Not listed as a carcinogen by ACGIH, IARC, NIOSH, NTP, OSHA, or CA Prop 65.

**Epidemiology:** Not available.

**Teratogenicity:** Not available.

**Reproductive:** Not available.

**Mutagenicity:** Not available.

**Neurotoxicity:** No information available.

## SECTION 12 – Ecological Information

**Ecotoxicity:** No information available.  
**Environmental:** No information reported.

**Physical:** No information available  
**Other:** No information available.

## SECTION 13 – Disposal Considerations

**Dispose of in a manner consistent with federal, provincial/territorial/state, and local regulations.**

**RCRA D-Maximum Concentration of Contaminants:** None of the components are on this list.

**RCRA D Series – Chronic Toxicity Reference Levels:** None of the components are on this list.

**RCRA F Series Wastes:** None of the components are on this list.

**RCRA P Series Wastes:** None of the components are on this list.

**RCRA U Series Wastes:** None of the components are on this list.

**RCRA Substances Banned from Land Disposal:** None of the components are on this list.

## SECTION 14 – Transport Information

**Proper Shipping Name:** PERCHLORIC ACID 70%

**Hazard Class:** 5.1 (8)

**UN Number:** UN1873

**Packing Group:** I

## SECTION 15 – Regulatory Information

### US Federal

**TSCA:** CAS# 7601-90-3 is listed on the TSCA Inventory. CAS# 7732-18-5 is listed on the TSCA Inventory.

**Health and Safety Reporting List:** None of the components are on this list.

**Chemical Test Rules:** None of the components are on this list.

**TSCA Section 12b:** None of the components are on this list.

**TSCA Significant New Use Rule (SNUR):** None of the components are on this list.

**CERCLA Reportable Quantities (RQ):** None of the components are on this list.

**SARA Threshold Planning Quantities (TPQ):** None of the components are on this list.

**SARA Hazard Categories:** CAS# 7601-90-3; acute, flammable.

**SARA Section 313:** None of the components are on this list.

**Clean Air Act – Hazardous Air Pollutants (HAPs):** None of the components are on this list.

**Clean Air Act – Class 1 Ozone Depletors:** None of the components are on this list.

**Clean Air Act – Class 2 Ozone Depletors:** None of the components are on this list.

**Clean Water Act – Hazardous Substances:** None of the components are on this list.

**Clean Water Act – Priority Pollutants:** None of the components are on this list.

**Clean Water Act – Toxic Pollutants:** None of the components are on this list.

**OSHA – Highly Hazardous:** CAS# 7601-90-3 is considered highly hazardous by OSHA.

### US State

**State Right to Know:** Perchloric acid can be found on the following state Right-to-Know lists: New Jersey, Florida, Pennsylvania, Massachusetts.

**California Prop 65:** No information available.

**California No Significant Risk Level:** No information available.

### European/International Regulations

**European Labelling in Accordance with EC Directives:**

**Hazard Symbols:** Risk Phrases: Safety Phrases: S 24/25 Avoid contact with skin and eyes.

**WGK (Water Danger/Protection):** No information available.

**Canadian DSL/NDSL:** CAS# 7601-90-3 is listed on Canada's DSL/NDSL List. CAS# 7732-18-5 is listed on Canada's DSL/NDSL List.

**Canadian WHMIS Classification:** This product has a WHMIS classification of C, E, F.

**Canada Ingredient Disclosure List:** CAS# 7601-90-3 is listed on Canada's Ingredient Disclosure List. CAS# 7732-18-5 is not listed on Canada's Ingredient Disclosure List.

**Exposure Limits:** CAS# 7601-90-3: OEL-CZECHOSLOVAKIA: TWA 1 mg/m<sup>3</sup>; STEL 2 mg/m<sup>3</sup>.

## SECTION 16 – Other Information

The statements contained herein are offered for informational purposes only and are based upon technical data. Seastar Chemicals Inc believes them to be accurate but does not purport to be all-inclusive. The above-stated product is intended for use only by persons having the necessary technical skills and facilities for handling the product at their discretion and risk. Since conditions and manner of use are outside our control, we (Seastar Chemicals Inc) make no warranty of merchantability or any such warranty, express or implied with respect to information and we assume no liability resulting from the above product or its use. Users should make their own investigations to determine suitability of information and product for their particular purposes.