

# SAFETY DATA SHEET (SDS)

according to Hazardous Products Regulations (SOR/2015-17)

Perchloric Acid, 60-72% w/w

Revision date: 11/17/2022 (mm/dd/yyyy)

Revision number: 4.2

## SECTION 1 Identification

### 1.1. Product identifier

<b>Product name:</b>	Instrument Quality Perchloric Acid BASELINE Perchloric Acid Technical Grade Perchloric Acid	<b>Product number(s):</b>	S010201 S020201 S040201
<b>EU Index number:</b>	017-006-00-4		
<b>Synonyms:</b>	Dioxonium perchlorate; Hydronium perchlorate		
<b>Chemical names:</b>	DE Perchlorsäure; ES Ácido perclórico; FR Acide perchlorique; IT Acido perclorico; NL Perchlorzuur		

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

**Identified uses:** For laboratory use only. Not for drug, food, or household use.

### 1.3. Details of the supplier of the safety data sheet

**Manufacturer:**

SEASTAR CHEMICALS ULC  
2061 Henry Avenue West, Sidney, BC V8L 5Z6 CANADA  
1-250-655-5880

**Email:** SCI-QA&RegulatoryAffairs@seastarchemicals.com

### 1.4. Emergency telephone number

**CAN (CANUTEC):** 1-613-996-6666 (24-hour)

## SECTION 2 Hazard identification

### 2.1. Classification of the substance or mixture

**Classification in accordance 29 CFR 1910 (OSHA HCS) / WHMIS HPR / Regulation (EC) No 1272/2008**

Oxidizing liquid, category 1

Skin corrosion, category 1A

Corrosive to metals, category 1

### 2.2. Label elements

**Pictograms:**



**Signal word:** Danger

**Hazard statements:** H271: May cause fire or explosion; strong oxidizer.

H314: Causes severe skin burns and eye damage.

H290: May be corrosive to metals.

**Precautionary statements:** P260: Do not breathe fume, gas, mist, vapours, or spray.

P280: Wear protective gloves, protective clothing, eye protection, and face protection.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

P310: Immediately call a POISON CENTER or doctor.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

### 2.3. Other hazards

For the full text of the H-Statement(s) and P-Statement(s) mentioned in this Section, see Section 16.

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## SECTION 3 Composition/Information on ingredients

### 3.2. Mixtures

Chemical name	Chemical formula	Weight percent <sup>1</sup>	CAS №	EINECS №
Perchloric acid	HClO <sub>4</sub>	60-72% w/w	7601-90-3	231-512-4
Water	H <sub>2</sub> O	Balance	7732-18-5	231-791-2

<sup>1</sup>Weight Percent or percentage by mass (%): 100x (mass solute/mass total solution after mixing). Expressed as % w/w

## SECTION 4 First-aid measures

### 4.1. Description of first aid measures

**Inhalation:** Can release corrosive substances like chlorine and chlorine dioxide. Take precautions to ensure your own safety before attempting rescue (e.g., wear appropriate protective equipment, use the buddy system). Remove source of exposure or move person to fresh air and keep comfortable for breathing. Immediately call a Poison Centre or doctor. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by a Poison Centre or doctor. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.

**Skin:** Avoid direct contact. Wear chemical protective clothing, if necessary. Take off immediately all contaminated clothing, shoes, and leather goods (e.g., watchbands, belts). Rinse skin with lukewarm, gently flowing water or shower for 30 minutes. Immediately call a Poison Centre or doctor. Double bag, seal, label and leave contaminated clothing, shoes, and leather goods at the scene for safe disposal.

**Eye:** Avoid direct contact. Wear chemical protective gloves, if necessary. Rinse eyes cautiously with lukewarm, gently flowing water for several minutes, while holding the eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing for a total of 30 minutes. Take care not to rinse contaminated water into the unaffected eye or onto the face. Immediately call a Poison Centre or doctor.

**Ingestion:** Rinse mouth. Do NOT induce vomiting. If vomiting occurs naturally, lie on your side in the recovery position. Immediately call a Poison Centre or doctor.

**First aid comments:** Provide general supportive measures (comfort, warmth, rest). Consult a doctor and/or the nearest Poison Control Centre for all exposures. Some first aid procedures recommended above require advanced first aid training. Protocols for undertaking advanced procedures must be developed in consultation with a doctor and routinely reviewed. All first aid procedures should be periodically reviewed by a doctor familiar with the material and its conditions of use in the workplace.

### 4.2. Most important symptoms and effects, both acute and delayed

Perchloric acid solutions are corrosive. Symptoms may include difficulty swallowing, intense thirst, nausea, vomiting, diarrhea, and in severe cases, collapse, and death. A severe exposure may result in a potentially life-threatening accumulation of fluid in the lungs (pulmonary edema). Symptoms of pulmonary edema (tightness in the chest and shortness of breath) can develop up to 48 hours after exposure and are aggravated by physical exertion.

### 4.3. Indication of any immediate medical attention and special treatment needed

Consult a doctor and/or the nearest Poison Control Centre for all exposures.

## SECTION 5 Fire-fighting measures

### 5.1. Extinguishing media

Perchloric acid does not burn. Extinguish fire using extinguishing agent suitable for the surrounding fire and not contraindicated for use with perchloric acid. Perchloric acid is an oxidizer. Therefore, flooding quantities of water spray or fog should be used to fight fires involving perchloric acid. DO NOT use dry chemical fire extinguishing agents containing ammonium compounds (such as some A:B:C agents), since an explosive compound can be formed. DO NOT use carbon dioxide, dry chemical powder, or other extinguishing agents that smother flames, since they are not effective in extinguishing fires involving oxidizers.

### 5.2. Special hazards arising from the substance or mixture

Perchloric acid solutions do not burn. However, perchloric acid is an oxidizing agent and is a serious fire and explosion hazard. Dilute (below 50%) or cold (below 49°C) perchloric acid solutions have little or no oxidizing power. Concentrated solutions (50-72%) are moderate to powerful oxidizing agents; decomposition produces large amounts of oxygen, which form an oxygen-rich atmosphere

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that promotes combustion. Perchloric acid solutions can cause combustible materials to ignite spontaneously and will support, accelerate, and intensify the burning of combustible materials in a fire. Some substances that do not normally burn in air will ignite or explode upon contact with perchloric acid. Explosive decomposition may occur under fire conditions and closed containers may rupture violently due to rapid decomposition, if exposed to fire or excessive heat for a sufficient period of time. No part of a container should be subjected to a temperature higher than 49°C (120°F).

**Hazardous combustion products:** During a fire, corrosive chlorine and hydrogen chloride gases and dangerously reactive and corrosive chlorine dioxide will be formed.

## 5.3. Advice for firefighters

Firefighter's normal protective equipment (Bunker Gear) will not provide adequate protection. Chemical protective clothing (e.g., chemical splash suit) and positive pressure self-contained breathing apparatus (NIOSH approved or equivalent) may be necessary.

## SECTION 6 Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. Wear adequate personal protective equipment. Remove all combustible and organic materials.

### 6.2. Environmental precautions

Notify government occupational health and safety and environmental authorities.

### 6.3. Methods and material for containment and cleaning up

Do not touch spilled material. Stop or reduce leak if safe to do so. Prevent material from entering sewers, waterways, or confined spaces. Keep materials that can burn away from spilled material. Contain spill using non-combustible, non-reactive absorbent material free from contamination from organic material.

**SMALL SPILLS:** Neutralize acid by carefully adding soda ash ( $\text{Na}_2\text{CO}_3$ ). Transfer liquid to a container of water for disposal. Keep residue wet to prevent combustion upon drying. Flush area with water.

**LARGE SPILLS:** Contact fire and emergency services and supplier for advice.

**NOTE:** If possible, neutralize the spill with a reducing agent such as sodium bisulfate or ferrous sulfate. The sludge is then transferred to a container of water and neutralized with soda ash. Flush area with water.

### 6.4. Reference to other sections

See Section 7 for information on handling. See Section 8 for information on personal protection. See Section 13 for information on disposal.

## SECTION 7 Handling and storage

### 7.1. Precautions for safe handling

**Do not use this product once the expiration date is reached. The expiration date defines both the end of the product shelf life and its certification. The expiration date is conditional; products must be stored and transported according to SEASTAR™'s Product Integrity Guidelines.**

Plastic bottles should be inspected regularly, specifically HDPE bottles, for any evidence of change to the plastic bottle's ability to deform. The ability to deform is defined by its ductility/plasticity/malleability/embrittlement, or hardening/compressibility. If any change is noticed, carefully and safely transfer or dispose of the product according to your safe handling practices and procedures. Any product disposal must be done according to applicable regulations governing the disposal of the hazardous product.

This material is a MILD to STRONG OXIDIZING AGENT and is also CORROSIVE (to eyes and skin). Before handling, it is very important that engineering controls are operating, and that protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use. Maintenance and emergency personnel should be advised of potential hazards. Unprotected persons should avoid all contact with this chemical including contaminated equipment. Immediately report leaks, spills, or failures of the engineering controls. If perchloric acid solution is spilled, immediately evacuate the area. Seek medical attention for all inhalation exposures even if an exposure did not seem excessive. Symptoms of a severe exposure can be delayed.

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Do not allow perchloric acid to come into contact with strong dehydrating agents (concentrated sulphuric acid, anhydrous phosphorous pentoxide, etc.). Do not allow solutions to further concentrate by the evaporation of the water. Prevent contact with organic materials. Contact with combustible or flammable materials can cause fire or explosion. This material promotes combustion. It can react violently or explosively with many organic and inorganic chemicals. See Section 10 for more information.

Oxidizing power increases with concentration as well as temperature of the solution. Keep the material cool. Any use of this material in an elevated temperature process must be thoroughly evaluated to determine safe operating conditions. Use hot plates or steam baths to heat solutions rather than open flame heating or oil baths. In some circumstances, quartz rather than glass apparatus should be considered. Do not perform any welding, cutting, soldering, drilling or other hot work on an empty vessel, container or piping until all material has been cleared and has been confirmed 'clean'.

Use the smallest possible amounts in an area separate from the storage area. Avoid generating vapours (if heating) or mists. Prevent the release of vapours and mists into the workplace air. Use a fumehood or local exhaust system designed for perchloric acid use. Ensure that this device is properly maintained on a regular basis and is used appropriately by trained personnel.

Do not attempt to open a container if it is of unknown age or if its physical characteristics differ from the pure substance (such as colour change, crystal formation). The bottle containing perchloric acid solutions should be kept moist at all times to prevent the formation of explosive crystals between the bottle and the cap. To achieve this, the acid bottle should be stored inside a second bottle containing some water. Perform all operations on chemically resistant and non-absorbent surfaces such as steel or epoxy composites. Avoid contact with cellulose materials such as wood, paper, and cotton.

Inspect containers for damage or leaks before handling. Keep only in original container. To avoid splashing, carefully dispense into sturdy containers made of compatible materials. In general, add to cold water slowly, in small amounts and stir frequently to avoid excessive heat generation. Label containers. Handle containers carefully to avoid damage. Keep closed when not in use to avoid spillage or contamination of the contents.

Do not mix perchloric acid waste with any other waste. Trace amounts of contaminant may cause dangerous decomposition. Never return unused or contaminated material to its original container. Always assume that empty containers contain hazardous residues. Never reuse empty containers, even if they appear to be clean. Maintain handling equipment - prevent leaks of grease or other lubricants from equipment where this chemical is used. Have suitable emergency equipment for fires, spills, and leaks readily available. Practice good housekeeping. Comply with applicable regulations.

### 7.2. Conditions for safe storage, including any incompatibilities

Store in a cool, dry area, out of direct sunlight and away from heat and ignition sources. Storage area should be clearly identified, well-illuminated, clear of obstruction and accessible only to trained and authorized personnel. Keep quantities stored as small as possible. Containers should not be subjected to a temperature higher than 49°C (120°F).

If possible, store this material separately from other chemicals. If total segregation is not feasible, it may be stored with other inorganic acids. It must not come into contact with any organic materials, flammable or combustible materials or strong dehydrating agents such as sulphuric acid. See Section 10 for more information.

Discard the material if discolouration occurs. If a bottle containing perchloric acid has crystals forming around the bottom of the bottle, there is a potential explosion hazard. Do not move the bottle. Contact the supervisor for immediate assistance.

Construct walls, floors, ventilation system, pallets, and shelving in storage areas from non-combustible and resistant materials that are compatible with perchloric acid (such as steel, tile, epoxy composites). Keep storage area separate from work areas. Post warning signs. Inspect storage area regularly for any deficiencies, including damaged or leaking containers, corrosion, and poor housekeeping.

Inspect all incoming containers to make sure they are properly labelled and not damaged. Always store in original labelled container. Protect the label and keep it visible. Keep containers tightly closed when not in use and when empty. Protect from damage. Store containers at a convenient height for handling, below eye level if possible. Keep empty containers tightly closed in separate storage area. Empty containers and storage trays may contain hazardous residues.

Have appropriate fire extinguishers and spill clean-up equipment in storage area. Keep absorbents or neutralizers for leaks and spills readily available. Contain spills or leaks by storing in trays made from compatible materials such as glass or porcelain. Wipe the trays periodically. Provide raised sills or ramps at doorways or create a trench which drains to a safe location. Floors should be watertight and without cracks. Store oxidizing materials according to the occupational health and safety regulations and fire and building codes which will describe the kind of storage area and the type of storage containers for a specified amount of the material.

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## 7.3. Specific end use(s)

No information available.

## SECTION 8 Exposure controls/Personal protection

### 8.1. Control parameters

Chemical name	Limit value type	Exposure limit value	Source
Perchloric acid	None listed.	None listed.	None listed under NIOSH, ACGIH, or OSHA.
Water	None listed.	None listed.	Not applicable

### 8.2. Exposure controls

NOTE: Exposure to this material can be controlled in many ways. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure. This general information can be used to help develop specific control measures. Ensure that control systems are properly designed and maintained. Comply with occupational, environmental, fire, and other applicable regulations.

**Engineering Controls:** Engineering control methods to reduce hazardous exposures are preferred. Methods include mechanical (local exhaust) ventilation, process or personnel enclosure, control of process conditions and process modification (e.g., substitution of a less hazardous material). Administrative controls and personal protective equipment may also be required.

Because of the high potential reactivity and fire hazard of perchloric acid, stringent control measures such as enclosure (closed handling system) or isolation are necessary, even for handling very small quantities. Do not use organic or combustible materials such as wood in the construction of ventilation or other control systems. Floors should be concrete or tile, not wood.

Use corrosion-resistant local exhaust ventilation, separate from other ventilation system along with enclosure (perchloric acid fume hood). Ventilation systems specifically designed for exhausting perchloric acid mist and vapour must be used. This system should have a functioning wash-down system. Flush the system for at least 20-30 minutes at the end of each work session.

Exhaust hoods designed for perchloric acid should only be used for this purpose. Identify perchloric acid hoods with warning signs. Supply sufficient replacement air to make up for air removed by exhaust systems.

Any use of this material in an elevated temperature process must be thoroughly evaluated to determine safe operating conditions. An appropriate preventative maintenance program to prevent the accumulation of explosive perchloric acid salts in the ventilation hood and ducting should be developed and strictly followed. Consider testing to determine if acid or salts (perchlorates) are building up on surfaces including the inside of the ventilation system.

**Personal Protective Equipment:** If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection. Have appropriate equipment available for use in emergencies such as spills or fire. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance, and inspection.

**Eye / Face protection:** Wear chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. A face shield may also be necessary.

**Skin protection:** Wear impervious gloves and appropriate protective clothing. Choose body protection according to the amount and concentration of the substance at the workplace. A chemical protective full body encapsulating suit and respiratory protection may be required in some operations. Have a safety shower/eye-wash fountain readily available in the immediate work area.

**Resistance of Materials for Protective Clothing:** Guidelines for Perchloric acid concentrations of 30-70%:

RECOMMENDED (resistance to breakthrough longer than 8 hours): Butyl rubber; Natural rubber; Neoprene rubber; Nitrile rubber; Polyvinyl chloride (PVC); Viton®; Viton®/Butyl rubber; Tychem® BR/LV, Responder® CSM, TK, and Reflector.

RECOMMENDED (resistance to breakthrough longer than 4 hours): Barrier® - PE/PA/PE; Silver Shield® - PE/EVAL/PE.

NOT RECOMMENDED for use (resistance to breakthrough less than 1 hour and/or poor degradation rating): Polyvinyl alcohol (PVAL).

**Inhalation / Ventilation:** Use in a chemical fume hood. If the respirator is the sole means of protection, use a supplied-air respirator with a full facepiece. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

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**Personal Hygiene:** Remove contaminated clothing immediately. Keep contaminated clothing in closed containers. Discard or launder before re-wearing. Inform laundry personnel of contaminant's hazards. Do not eat, drink, or smoke in work areas. Wash hands thoroughly after handling this material. Maintain good housekeeping.

## SECTION 9 Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state:	Liquid	Vapour pressure:	Very low
Colour:	Clear, colourless	Vapour density:	Not applicable
Molecular weight:	100.46 g/mol	Density: (at 20 °C)	60% w/w: 1.5298 g/mL
Odour:	Slight chlorine odour		70% w/w: 1.6680 g/mL
Odour threshold:	No information available.	Solubility:	Soluble in all proportions in water. No information available for solubility in other liquids.
pH:	1 (1% w/w); 0.5 (10% w/w) (calc.)		
Melting/freezing point:	72.4% w/w: -18 °C (-0.4 °F)		
Boiling point:	61.2% w/w: 162.3 °C (324 °F)	Partition coefficient:	Log P(oct) = -4.63 (est.)
	72.4% w/w: 203 °C (397.4 °F)	Auto-ignition temperature:	Not applicable
Flash point:	Not combustible (does not burn).	Decomposition temperature:	No information available.
Flammability (solid, gas):	Not applicable	Evaporation rate:	Negligible
Flammable (explosive) limits:	Lower (LFL/LEL): Not applicable	Viscosity: (at 20 °C)	60% w/w: 2.8 mPa·s (2.8 cP)
	Upper (UFL/UEL): Not applicable		70% w/w: 4.5 mPa·s (4.5 cP)

### 9.2. Other information

No information available.

## SECTION 10 Stability and reactivity

### 10.1. Reactivity

The National Fire Protection Association (NFPA) lists perchloric acid solutions (less than 50% by weight) as a Class 1 Oxidizer, perchloric acid solutions (more than 50% but less than 60%) as a Class 2 Oxidizers, and perchloric acid solutions (60-72% by weight) as a Class 3 Oxidizer. Class 1 Oxidizers do not moderately increase the burning rate of combustible materials with which they come into contact. Class 2 Oxidizers cause a moderate increase in the burning rate of combustible materials with which they come into contact. Class 3 Oxidizers cause a severe increase in the burning rate of combustible materials with which they come into contact.

### 10.2. Chemical stability

Normally stable. The anhydrous form of this material is an explosion hazard. Pure, anhydrous perchloric acid and solutions >85% are extremely unstable; avoid dehydrating agents. Hygroscopic.

### 10.3. Possibility of hazardous reactions

Hazardous polymerization does not occur. See Section 10.5 for incompatible materials.

### 10.4. Conditions to avoid

Heat, combustible materials, other contaminants, dehydrating agents.

### 10.5. Incompatible materials

NOTE: Chemical reactions that could result in a hazardous situation (e.g., generation of flammable or toxic chemicals, fire, or detonation) are listed here. Many of these reactions can be done safely if specific control measures (e.g., cooling of the reaction) are in place. Although not intended to be complete, an overview of important reactions involving common chemicals is provided to assist in the development of safe work practices.

**WARNING:** It is fairly easy to produce the dangerous anhydrous perchloric acid from either its salts or its aqueous solutions by heating with high boiling acids and dehydrating agents such as sulphuric acid and phosphorus pentoxide.

COMBUSTIBLE MATERIALS (e.g., wood, cotton, wool, cloth, oils, or grease) or CELLULOSE and DERIVATIVES (e.g., paper, wood fibres, sawdust) - contact with hot concentrated acid may cause ignition or a violent explosion. Many fires have been caused by the



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long-term contact of dilute acid with wood.

DEHYDRATING AGENTS (e.g., sulphuric acid, phosphorus pentoxide, phosphoric acid) - can explode spontaneously.

ACETIC ANHYDRIDE and ACETIC ACID - mixtures are sensitive to shock, heat, and the introduction of organic contaminants. Vapours above the heated liquid are flammable.

ALCOHOLS (e.g., ethanol or methanol), BASES (e.g., sodium or potassium hydroxide), FLUORINE, TRICHLOROETHYLENE, ACETONITRILE, DIMETHYL ETHER, PHOSPHINE, PYRIDINE or NITRIC ACID and ORGANIC MATTER (e.g., vegetable oil, milk, plant material) - can react violently or explosively.

GLYCOLS (e.g., ethylene glycol), GLYCOL ETHERS (e.g., 2-ethoxyethanol), GLYCEROL, DIETHYL ETHER or KETONES - undergo violent decomposition in contact with 68-72% perchloric acid.

ANTIMONY COMPOUNDS (TRIVALENT) or BISMUTH - form explosive mixtures when hot.

STEEL - explosions have occurred when 72% perchloric acid came into contact with steel.

HYDRIODIC ACID, SODIUM IODIDE or SULFINYL CHLORIDE - ignite spontaneously on contact.

HYPOPHOSPHITES (e.g., sodium hypophosphite) or REDUCING AGENTS (e.g., charcoal or sodium phosphinate) - can explode violently upon heating

ORGANIC SULFOXIDES (e.g., dimethyl sulfoxide or dibutyl sulfoxide) - lower members of the series of salts formed are unstable and explosive when dry.

NITROGEN TRIIODIDE or NITROSOPHENOL - addition of concentrated acid causes explosion.

ANILINE and FORMALDEHYDE - react to form explosively combustible condensed resin.

## 10.6. Hazardous decomposition products

Chlorine/chlorine oxides, hydrogen chloride, oxygen.

## 10.7. Corrosivity to metals:

Perchloric acid solutions (10-70%) are corrosive (corrosion rate greater than 1.25 mm/year) to most common metals, such as stainless steel (e.g. types 304, 316, 403, 410, and 430), aluminum alloys 3003, Cast B-356 and other alloys, carbon steel alloys 1010, 1020, 1075 and 1095, cast iron (unspecified), gray and nickel cast iron, nickel, nickel-base alloy Monel, nickel-copper, copper, cartridge brass, naval brass, yellow brass, leaded red brass and silicon bronze at 21.1 °C (70 °F). They are not corrosive to Hastelloy C and C-276, Carpenter 20Cb-3 and high silicon cast iron (Duriron).

## 10.8. Corrosivity to non-metals:

Perchloric acid solutions (10-70%) attack some plastics (such as Acrylonitrile-butadiene-styrene (ABS), Acetal copolymer, Noryl, Nylon, Phenolic, Polyesters (Bisphenol A, isophthalic and terephthalic), polychloroprene (above 21 °C), PVC (above 21 °C)), elastomers (neoprene (70%), nitrile Buna A, polymethyl methacrylate (70%), polyurethane and silicone rubbers) and some coatings. They do not attack chlorinated polyether (Penton), Chemraz, Kalrez, Kynar, Teflon, Halar, Hypalon, Tefzel, polyethylene (below 65 °C), polypropylene (below 93 °C), polyvinylidene chloride (Saran) and Viton A.

## SECTION 11 Toxicological information

### 11.1. Information on toxicological effects

RTECS#: SC7500000

#### Acute toxicity:

Oral LD50: 1,100 mg/kg (rat)

Dermal LD50: No information available.

Inhalation LC50: No information available.

Other information: No information available.

#### Exposure routes:

**Inhalation:** May be fatal if inhaled. Perchloric acid does not readily form a vapour at room temperature. Therefore, inhalation exposure is unlikely to occur unless it is misted. Mists formed from solutions are probably severely irritating or corrosive to the nose, throat, and lungs. A severe exposure may result in a potentially life-threatening accumulation of fluid in the lungs (pulmonary edema). Symptoms of pulmonary edema (tightness in the chest and shortness of breath) can develop up to 48 hours after exposure and are aggravated by physical exertion. If heated, perchloric acid forms corrosive gases (chlorine and chlorine dioxide).

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**Skin:** Perchloric acid solutions are corrosive to the skin and can cause severe burns, blistering and permanent scarring depending on the concentration and the duration of contact.

**Eye:** Perchloric acid solutions can cause serious eye damage and are capable of producing severe eye burns, and permanent injury, including blindness, depending on the concentration and the duration of contact.

**Ingestion:** Perchloric acid solutions are corrosive and are capable of causing burns to the lips, tongue, throat, esophagus, and stomach if swallowed. Symptoms may include difficulty swallowing, intense thirst, nausea, vomiting, diarrhea, and in severe cases, collapse, and death.

**Germ cell mutagenicity:** Perchloric acid solutions are not known to be mutagenic.

**Carcinogenicity:** Perchloric acid solutions are not known to be carcinogenic. The International Agency for Research on Cancer (IARC) has not evaluated the carcinogenicity of this chemical. The American Conference of Governmental Industrial Hygienists (ACGIH) has no listing for this chemical. The US National Toxicology Program (NTP) has not listed this chemical in its report on carcinogens.

**Reproductive toxicity:** Perchloric acid solutions are not known to cause reproductive toxicity.

**Additional information:** Perchloric acid solutions are corrosive and repeated exposures are expected to cause chronic respiratory and skin irritation. Perchloric acid solutions are not known to be respiratory or skin sensitizers. To the best of our knowledge the chronic toxicity of this substance has not been fully investigated.

## SECTION 12 Ecological information

### 12.1. Toxicity

Common carp (*Cyprinus carpio*): LC100 = 180 ppm/24H at 25 °C

### 12.2. Persistence and degradability

Persistent.

### 12.3. Bioaccumulative potential

Bioaccumulation is not anticipated for inorganic compounds that are miscible with water.

### 12.4. Mobility in soil

No information available.

### 12.5. Results of PBT and vPvB assessment

Not applicable for inorganic substances.

### 12.6. Other adverse effects

No information available.

## SECTION 13 Disposal considerations

### 13.1. Waste treatment methods

Review local/regional/international regulations or requirements prior to disposal. Store material for disposal as indicated in Section 7. **Contaminated packaging:** Dispose of as unused product.

## SECTION 14 Transport information

14.1. UN number	UN1873
14.2. UN proper shipping name	PERCHLORIC ACID
14.3. Transport hazard class(es)	5.1 (8)
Hazard label(s):	5.1+8
14.4. Packing group	I
14.5. Environmental hazards	
Marine pollutant:	No
14.6. Special precautions for user	
IMDG EMS number:	F-A, S-Q
IMDG Category:	D



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## 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

## SECTION 15 Regulatory information

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

**OSHA Hazards:** CAS #7601-90-3 meets criteria for hazardous material, as defined by 29 CFR 1910.1200.

#### SARA:

**302:** This material contains Perchloric acid (CAS# 7601-90-3), which is not subject to the reporting requirement of 1,000 lbs RQ.

**313:** This material contains Perchloric acid (CAS# 7601-90-3), which is not subject to the reporting requirements of Section 313 of SARA Title III.

**311/312:** This material contains Perchloric acid (CAS# 7601-90-3).

#### Right To Know Lists:

**Massachusetts:** CAS# 7601-90-3 is listed, 10 lbs RQ.

**Pennsylvania:** CAS# 7601-90-3 is listed.

**New Jersey:** CAS# 7601-90-3 is listed, RTK# 2637.

**California Prop. 65:** CAS# 7601-90-3 is not subject to this act. CAS# 7732-18-5 is not subject to this act.

#### Inventory Status:

**Canada DSL/NDL Inventory List:** CAS# 7601-90-3 is listed. CAS# 7732-18-5 is listed.

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

**EC Inventory List:** CAS# 7601-90-3 is listed, EC# 231-512-4. CAS# 7732-18-5 is listed, EC# 231-791-2.

### 15.2. Chemical safety assessment

Not applicable.

## SECTION 16 Other information

### Full text of H-Statement(s) and P-Statement(s):

H271: May cause fire or explosion; strong oxidizer.

H314: Causes severe skin burns and eye damage.

H290: May be corrosive to metals.

P210: Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.

P220: Keep away from clothing and other combustible materials.

P234: Keep only in original packaging.

P260: Do not breathe fume, gas, mist, vapours, or spray.

P264: Wash thoroughly after handling.

P280: Wear protective gloves, protective clothing, eye protection, and face protection.

P283: Wear fire resistant or flame retardant clothing.

P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P303+P361+P353: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.

P310: Immediately call a POISON CENTER or doctor.

P363: Wash contaminated clothing before reuse.

P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P370+P378: In case of fire: Extinguish fire using extinguishing agent suitable for the surrounding fire.

P371+P380+P375: In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

P390: Absorb spillage to prevent material damage.

P405: Store locked up.

P420: Store separately.

P501: Dispose of contents and container according to federal, regional, and local government requirements.

# SAFETY DATA SHEET (SDS)

according to Hazardous Products Regulations (SOR/2015-17)

Perchloric Acid, 60-72% w/w

Revision date: 11/17/2022 (mm/dd/yyyy)

Revision number: 4.2

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**Date modified:** 11-2022, Supersedes 12-2019, 01-2018, 07-2014, 04-2011, 12-2010

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*The statements contained herein are offered for informational purposes only and are based upon technical data. SEASTAR CHEMICALS ULC 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 ULC) 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.*