SAFETY DATA SHEET

1. Identification

Product identifier **PERCHLORIC ACID, 60% SUPERIOR REAGENT (ACS)**

Other means of identification

Product code 2967

Recommended use manufacture of other chemical products, professional, scientific and technical activities: scientific research and development

Recommended restrictions None known.

Manufacturer/Importer/Supplier/Distributor information

Company name GFS Chemicals, Inc.

Address P.O. Box 245
Powell
OH
43065
US

Telephone Phone 740-881-5501
Toll Free 800-858-9682
Fax 740-881-5989

Website www.gfschemicals.com

E-mail service@gfschemicals.com

Emergency phone number Emergency Assistance Chemtrec 800-424-9300

2. Hazard(s) identification

Physical hazards	Oxidizing liquids	Category 1
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 1A
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 2 (respiratory system)

OSHA hazard(s) Not classified.

Label elements

Signal word Danger

Hazard statement May cause fire or explosion; strong oxidizer. Causes severe skin burns and eye damage. Harmful if swallowed.

Precautionary statement

Prevention Keep away from heat. Keep/Store away from clothing and other combustible materials. Take any precaution to avoid mixing with combustibles. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/eye protection/face protection.

Response IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. If on clothing: Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Rinse mouth. In case of fire: Use appropriate media for extinction. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Storage Store away from combustibles.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations. Dispose of contents/container to an approved landfill.

Hazard(s) not otherwise classified (HNOC) Not classified.

3. Composition/information on ingredients

Mixtures

Hazardous components

Chemical name	CAS number	%
PERCHLORIC ACID	7601-90-3	60

Non-hazardous components

Chemical name	CAS number	%
WATER	7732-18-5	40

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First-aid measures

Inhalation Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Get medical attention if irritation develops or persists.

Eye contact Rinse with water. Get medical attention if irritation develops and persists.

Ingestion IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.

Most important symptoms/effects, acute and delayed Not available.

Indication of immediate medical attention and special treatment needed In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed. Provide general supportive measures and treat symptomatically.

General information Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

5. Fire-fighting measures

Suitable extinguishing media Flood with water. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Not available.

Specific hazards arising from the chemical May cause fire or explosion; strong oxidizer. Strong oxidizer - contact with other material may cause fire.

Special protective equipment and precautions for firefighters Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

Fire-fighting equipment/instructions In case of fire: Stop leak if safe to do so. In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Move containers from fire area if you can do so without risk. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak. Keep upwind. Keep out of low areas. Ensure adequate ventilation. Wear appropriate personal protective equipment.

Methods and materials for containment and cleaning up DO NOT CLEAN-UP OR DISPOSE OF, EXCEPT UNDER SUPERVISION OF A SPECIALIST. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Eliminate ignition sources including sources of electrical, static or frictional sparks. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Dilute with water. Keep combustibles (wood, paper, oil, etc.) away from spilled material. This product is miscible in water. Prevent entry into waterways, sewers, basements or confined areas.

Large Spills: Stop leak if you can do so without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Clean contaminated surface thoroughly. Neutralize spilled material with crushed limestone, soda ash or lime. After removal flush contaminated area thoroughly with water. Following product recovery, flush area with water. Prevent entry into waterways, sewer, basements or confined areas. Clean up in accordance with all applicable regulations.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills in original containers for re-use. For waste disposal, see section 13 of the MSDS.

Environmental precautions Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling Take any precaution to avoid mixing with combustibles. Keep away from heat. Do not taste or swallow. When using, do not eat, drink or smoke. Wash hands thoroughly after handling.

Conditions for safe storage, including any incompatibilities Do not store around flammable or combustible materials. Keep away from heat. Keep container tightly closed. Do not store near combustible materials. Keep out of the reach of children. Store in a cool, dry place out of direct sunlight.

8. Exposure controls/personal protection

Occupational exposure limits No exposure limits noted for ingredient(s).

Biological limit values No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls General ventilation normally adequate.

Individual protection measures, such as personal protective equipment

- **Eye/face protection** Wear eye/face protection.
- **Skin protection**
  - **Hand protection** Wear protective gloves.
  - **Other** Wear suitable protective clothing. Wear fire/flame resistant/retardant clothing. Wear protective gloves.
- **Respiratory protection** In case of mist, spray or aerosol exposure wear suitable personal respiratory protection and protective suit.
- **Thermal hazards** Not available.

General hygiene considerations Provide eyewash station and safety shower. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance Clear.

- **Physical state** Liquid.
- **Form** Liquid.
- **Color** Colorless.

Odor Odorless.

Odor threshold Not available.

pH very acidic

Initial boiling point and boiling range 318 °F (159 °C)

Flash point Not flammable

Evaporation rate Not available.

Flammability (solid, gas) Not applicable.

Upper/lower flammability or explosive limits

- **Flammability limit - lower (%)** Not flammable
- **Flammability limit - upper (%)** Not flammable
- **Explosive limit - lower (%)** Not available.
- **Explosive limit - upper (%)** Not available.

Vapor density Not available.

Relative density Not available.

Solubility(ies) Completely miscible

Partition coefficient (n-octanol/water) Not available.

Auto-ignition temperature Not available.

Decomposition temperature Not available.

Viscosity Not available.

Other information

Density	1.54 g/cm3
Molecular formula	HClO4
Molecular weight	100.47 g/mol
Specific gravity	1.54

10. Stability and reactivity

Reactivity	Organic compounds.
Chemical stability	Stable at normal conditions. Becomes oxidizing at elevated temperatures (>150 C). Risk of explosion. hygroscopic.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Avoid temperatures above 300°F (150°C). Drying of this product on clothing or combustible materials may cause fire.
Incompatible materials	Flammable materials and Combustible material.
Hazardous decomposition products	Toxic gas. Irritants.

11. Toxicological information

Information on likely routes of exposure

Ingestion	Harmful if swallowed.
Inhalation	Irritating to respiratory system.
Skin contact	Causes severe skin burns and eye damage.
Eye contact	Causes serious eye damage.
Symptoms related to the physical, chemical and toxicological characteristics	Not available.

Information on toxicological effects

Acute toxicity Harmful if swallowed.

Product	Species	Test Results
PERCHLORIC ACID (CAS Mixture)		
Acute		
Oral		
LD50	Rat	1100 mg/kg

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation	Corrosive to skin and eyes.
Serious eye damage/eye irritation	Risk of serious damage to eyes.
Respiratory sensitization	Based on available data, the classification criteria are not met.
Skin sensitization	Based on available data, the classification criteria are not met.
Germ cell mutagenicity	Based on available data, the classification criteria are not met.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Reproductive toxicity	Based on available data, the classification criteria are not met.
Specific target organ toxicity - single exposure	Based on available data, the classification criteria are not met.
Specific target organ toxicity - repeated exposure	Based on available data, the classification criteria are not met.
Aspiration hazard	Due to lack of data the classification is not possible.

12. Ecological information

Ecotoxicity	No ecotoxicity data noted for the ingredient(s).
Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	Not available.
Mobility in soil	Not available.
Other adverse effects	Not available.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose of contents/container in accordance with local/regional/national/international regulations. Solutions with low pH-value must be neutralized before discharge.
Local disposal regulations	Not available.
Hazardous waste code	D001: Waste Flammable material with a flash point <140 F D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Taking into account local regulations the product may be disposed of as waste water after neutralisation.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN1873
UN proper shipping name	Perchloric acid with more than 50 percent but not more than 72 percent acid, by mass
Transport hazard class(es)	5.1
Subsidary class(es)	8
Packing group	I
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Labels required	5.1, 8
Special provisions	A2, A3, N41, T10, TP1, TP12
Packaging exceptions	None
Packaging non bulk	201
Packaging bulk	243

IATA

UN number	UN1873
UN proper shipping name	Perchloric acid 72% or less but more than 50% acid, by weight
Transport hazard class(es)	5.1
Subsidary class(es)	8
Packaging group	I
Environmental hazards	No
Labels required	Not available.
ERG Code	5C
Special precautions for user	Not available.

IMDG

UN number	UN1873
UN proper shipping name	PERCHLORIC ACID with more than 50% but not more than 72% acid, by mass
Transport hazard class(es)	5.1
Subsidary class(es)	8
Packaging group	I
Environmental hazards	
Marine pollutant	No
Labels required	Not available.
EmS	F-A, S-Q
Special precautions for user	Not available.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No information available.

DOT

IATA; IMDG

15. Regulatory information

US federal regulations CERCLA/SARA Hazardous Substances - Not applicable.

All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not on regulatory list.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance No

SARA 311/312 Hazardous chemical No

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Administration (FDA) Not regulated.

US state regulations California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

US. Massachusetts RTK - Substance List

PERCHLORIC ACID (CAS 7601-90-3)

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania RTK - Hazardous Substances

PERCHLORIC ACID (CAS 7601-90-3)

US. Rhode Island RTK

PERCHLORIC ACID (CAS 7601-90-3)

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)

16. Other information, including date of preparation or last revision

Issue date February-05-2013

Version # 01

Further information Not available.

Disclaimer The information in the sheet was written based on the best knowledge and experience currently available. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.