SAFETY DATA SHEET

1. Identification

Product identifier **Sulfuric Acid, Fuming (Oleum greater than or equal to 30%)**

Other means of identification 150000002269

SDS number Raw material. Chemical intermediate.

Recommended use Not to be used as a biocidal product. Not to be used as a drain cleaner. Not to be used as a direct component of a cleaning product. Not to be used for cleaning sludge out of oil tanks.

Recommended restrictions

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name Nexpera LLC

Address 131 Continental Dr. Suite 300
Newark, DE 19713
United States of America

Website Nexpera.com

Telephone 1-800-441-9362

1.4. Emergency telephone number CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

2. Hazard(s) identification

Physical hazards	Corrosive to metals	Category 1
Health hazards	Acute toxicity, inhalation	Category 1
	Skin corrosion/irritation	Category 1A
	Serious eye damage/eye irritation	Category 1
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, repeated exposure (inhalation)	Category 2 (respiratory system, teeth)

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May be corrosive to metals. Fatal if inhaled. Causes severe skin burns and eye damage. May cause respiratory irritation. May cause damage to organs (respiratory system, teeth) through prolonged or repeated exposure by inhalation.

Precautionary statement

Prevention Keep only in original container. Do not breathe mist/vapors. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Wear respiratory protection.

Response If swallowed: Rinse mouth. Do NOT induce vomiting. If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store in corrosive resistant container with a resistant inner liner.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)

Reacts violently with water. Reacts with most metals to form flammable hydrogen gas.

Supplemental information Corrosive to the respiratory tract.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Sulfur trioxide	7446-11-9	30 - 100
Sulfuric acid	7664-93-9	0 - 70

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Call a POISON CENTER or doctor/physician if you feel unwell.

Skin contact Take off immediately all contaminated clothing. Flush thoroughly with water for at least 15 minutes. Call a physician or poison control center immediately. Apply compresses of ice water while patient is being transported to medical facilities. Chemical burns must be treated by a physician. Wash contaminated clothing before reuse.

Eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Most important symptoms/effects, acute and delayed Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. Sulfur trioxide forms sulfuric acid when exposed to water or moisture in the air. Prolonged exposure to sulfuric acid mist may cause cancer.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Chemical burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information IF exposed or concerned: Get medical advice/attention. Take off all contaminated clothing immediately. Wash contaminated clothing before reuse. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media The product itself does not burn. Use fire-extinguishing media appropriate for surrounding materials. Carefully apply fine water mist or mid-expansion foam to slowly dilute to non fuming sulfuric acid. This process may release sulfuric acid mists into the air. Reaction with water and surrounding materials will generate heat and sulfuric acid mist.

Unsuitable extinguishing media None known.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed. Combustion products include: Sulfuric acid. Sulfur dioxides.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk. In the event of fire, cool tanks with water spray. Do not get water inside container.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe vapors or spray mist. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

This product is miscible in water. Should not be released into the environment. Prevent entry into waterways, sewer, basements or confined areas.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Dilute spill to non-fuming sulfuric acid (<100%) using a water fog or aqueous foam. Remove product with clean and dry vacuum truck or pump to storage/salvage vessel. Following product recovery, flush area with water. Neutralize with lime, soda ash or other alkali material.

Small Spills: Neutralize with lime, soda ash or other alkali material. Flush with plenty of water. Clean surface thoroughly to remove residual contamination.

Retain all contaminated water for removal and treatment. Put material in suitable, covered, labeled containers. For waste disposal, see Section 13 of the SDS.

Environmental precautions

Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Avoid prolonged exposure. When using, do not eat, drink or smoke. Should be handled in closed systems, if possible. Use only outdoors or in a well-ventilated area. Do not mix water and/or aqueous solutions with sulfur trioxide. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Wash contaminated clothing before reuse. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities

Store locked up. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Keep only in the original container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Permissible Exposure Limits (PEL) for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
Sulfuric acid (CAS 7664-93-9)	PEL	1 mg/m3

US. ACGIH Threshold Limit Values (TLV)

Components	Type	Value	Form
Sulfuric acid (CAS 7664-93-9)	TWA	0.2 mg/m3	Thoracic fraction.

NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended

Components	Type	Value
Sulfuric acid (CAS 7664-93-9)	IDLH	15 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
Sulfuric acid (CAS 7664-93-9)	TWA	1 mg/m3

Biological limit values

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

Appropriate engineering controls

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear chemical splash goggles in combination with a full-length face shield or an acid hood.

Skin protection

Hand protection

Wear appropriate chemical resistant gloves. Be aware that the liquid may penetrate the gloves. Frequent change is advisable.

Skin protection	
Other	Wear appropriate chemical resistant clothing. Full body chemical protective clothing. Chemical resistant boots.
Respiratory protection	Wear a NIOSH-approved (or equivalent) respirator as needed.
Thermal hazards	None known.
General hygiene considerations	Observe any medical surveillance requirements. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance	
Physical state	Liquid.
Form	Liquid.
Color	Off-white to amber.
Odor	Acrid.
Odor threshold	Not available.
pH	< 1
Melting point/freezing point	> 35.6 - < 66.2 °F (> 2 - < 19 °C) at 1,013 hPa (760 mm Hg).
Initial boiling point and boiling range	> 136.4 - < 249.8 °F (> 58 - < 121 °C) at 1,013 hPa (760 mm Hg).
Flash point	Does not flash.
Evaporation rate	< 1 (Butyl Acetate = 1.0)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Explosive limit - lower (%)	Not applicable.
Explosive limit - upper (%)	Not applicable.
Vapor pressure	> 19 - < 300 mm Hg (37.7°C/ 99.9°F) > 8.5 - < 105 mm Hg (25 °C / 77°F)
Vapor density	ca. 3 (Air = 1.0)
Relative density	> 1.952 - < 1.992 (15.6 °C / 60.1°F)
Solubility(ies)	
Solubility (water)	Completely soluble. Reacts violently with water liberating sulfuric acid mist cloud.
Partition coefficient (n-octanol/water)	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.

10. Stability and reactivity

Reactivity	Reacts violently with water liberating sulfuric acid mist cloud. Reacts violently with strong alkaline substances. This product may react with reducing agents. Can react with moisture in air to produce sulfuric acid mist.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	Hazardous polymerization does not occur.
Conditions to avoid	Heat. Contact with incompatible materials. Do not mix with other chemicals.
Incompatible materials	Water. Organic material. Nitrates. Chlorates. Perchlorates. Picrates. Carbides. Strong oxidizers. Reducing agents. Cyanides. Sulfides. Bases.
Hazardous decomposition products	Sulfur oxides.

11. Toxicological information

Information on likely routes of exposure

Inhalation	Corrosive to the respiratory tract. Sulfuric acid is corrosive to eyes, skin and mucous membranes. Prolonged or repeated inhalation may damage respiratory tissue and may erode tooth enamel.
Skin contact	Causes severe skin burns. May be harmful in contact with skin.
Eye contact	Causes serious eye damage.
Ingestion	Fatal if swallowed.
Symptoms related to the physical, chemical and toxicological characteristics	Burning pain and severe corrosive skin damage. Causes serious eye damage. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. May cause respiratory irritation. Sulfur trioxide forms sulfuric acid when exposed to water or moisture in the air. Prolonged exposure to strong inorganic acid mists may cause cancer.

Information on toxicological effects

Acute toxicity Fatal if inhaled.

Components	Species	Test Results
Sulfur trioxide (CAS 7446-11-9)		
Acute		
Inhalation		
Aerosol		
LC50	Rat	0.375 mg/l, 4 Hours

Skin corrosion/irritation	Causes severe skin burns.
Serious eye damage/eye irritation	Causes serious eye damage.
Respiratory or skin sensitization	
Respiratory sensitization	Not a respiratory sensitizer.
Skin sensitization	This product is not expected to cause skin sensitization.
Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

IARC Monographs. Overall Evaluation of Carcinogenicity

Strong inorganic acid mists containing sulfuric acid (CAS N/A)	1 Carcinogenic to humans.

NTP Report on Carcinogens

Strong inorganic acid mists containing sulfuric acid (CAS N/A)	Known To Be Human Carcinogen.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
Specific target organ toxicity - single exposure	May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	Sulfuric acid is corrosive to eyes, skin and mucous membranes. Prolonged or repeated inhalation may damage respiratory tissue and may erode tooth enamel.
Aspiration hazard	Not an aspiration hazard.

12. Ecological information

Ecotoxicity Because of the low pH of this product, it would be expected to produce significant ecotoxicity upon exposure to aquatic organisms and aquatic systems.

Components		Species	Test Results
Sulfuric acid (CAS 7664-93-9)			
Aquatic			
Acute			
Algae	ECr50	Desmodesmus subspicatus	> 100 mg/l, 72 hours
Crustacea	EC50	Daphnia magna	> 100 mg/l, 48 hours
Fish	LC50	Bluegill (Lepomis macrochirus)	16 mg/l, 96 hours
Chronic			
Fish	NOEC	Fish	0.025 mg/l, 65 days

Persistence and degradability Not applicable.

Bioaccumulative potential The product is not expected to bioaccumulate.

Partition coefficient n-octanol / water (log Kow)

Sulfuric acid (CAS 7664-93-9)	-2.2

Mobility in soil The product is miscible with water.

Other adverse effects Sulfur trioxide reacts violently with water to form sulfuric acid and sulfuric acid mists.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code D002: Waste Corrosive material [pH ≤2 or =>12.5, or corrosive to steel]
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose 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).

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number	UN1831
UN proper shipping name	Sulfuric acid, fuming (Sulfuric acid RQ = 1000 LBS)
Transport hazard class(es)	
Class	8
Subsidiary risk	6.1
Label(s)	8, 6.1
Packing group	I
Environmental hazards	
Marine pollutant	No.
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Special provisions	2, B9, B14, B32, B77, B84, N34, T20, TP2, TP12, TP13
Packaging exceptions	None
Packaging non bulk	227
Packaging bulk	244

IATA

UN number	UN1831
UN proper shipping name	FORBIDDEN DANGEROUS GOODS
Transport hazard class(es)	
Class	8
Subsidiary risk	6.1
Packing group	Not applicable.
Environmental hazards	No.
ERG Code	8P
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1831
UN proper shipping name	SULPHURIC ACID, FUMING
Transport hazard class(es)	
Class	8
Subsidiary risk	6.1
Packing group	I
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-B
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not established. However, this product is a liquid and if transported in bulk covered under MARPOL 73/78, Annex I.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

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

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Sulfuric acid (CAS 7664-93-9) Listed.

SARA 304 Emergency release notification

Sulfur trioxide (CAS 7446-11-9)	100 LBS
Sulfuric acid (aerosol forms only) (CAS 7664-93-9)	1000 LBS

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Toxic Substances Control Act (TSCA) All components of the mixture on the TSCA 8(b) inventory are designated “active”.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Chemical name	CAS number	Reportable quantity (pounds)	Threshold planning quantity (pounds)	Threshold planning quantity, lower value (pounds)	Threshold planning quantity, upper value (pounds)
Sulfur trioxide	7446-11-9	100	100		
Sulfuric acid	7664-93-9	1000	1000		

SARA 311/312 Hazardous chemical Yes

Classified hazard categories
Corrosive to metal
Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation
Specific target organ toxicity (single or repeated exposure)
Hazard not otherwise classified (HNOC)

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Sulfur trioxide	7446-11-9	30 - 100
Sulfuric acid	7664-93-9	0 - 70

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)

Sulfur trioxide (CAS 7446-11-9)
Sulfuric acid (CAS 7664-93-9)

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

Sulfur trioxide (CAS 7446-11-9)	6552
Sulfuric acid (CAS 7664-93-9)	6552

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

Sulfur trioxide (CAS 7446-11-9)	20 %WV
Sulfuric acid (CAS 7664-93-9)	20 %WV

DEA Exempt Chemical Mixtures Code Number

Sulfur trioxide (CAS 7446-11-9)	6552
Sulfuric acid (CAS 7664-93-9)	6552

US state regulations

US. Massachusetts RTK - Substance List

Sulfur trioxide (CAS 7446-11-9)
Sulfuric acid (CAS 7664-93-9)

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

Sulfur trioxide (CAS 7446-11-9)
Sulfuric acid (CAS 7664-93-9)

US. Pennsylvania Worker and Community Right-to-Know Law

Sulfur trioxide (CAS 7446-11-9)
Sulfuric acid (CAS 7664-93-9)

US. Rhode Island RTK

Sulfur trioxide (CAS 7446-11-9)
Sulfuric acid (CAS 7664-93-9)

California Proposition 65

WARNING: This product can expose you to chemicals including Strong inorganic acid mists containing sulfuric acid, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

California Proposition 65 - CRT: Listed date/Carcinogenic substance

Strong inorganic acid mists containing sulfuric acid (CAS N/A)	Listed: March 14, 2003

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Industrial Chemicals (AICIS)	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
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

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

Issue date	21-July-2017
Revision date	11-October-2023
Version #	03

NFPA ratings

Disclaimer

Nexpera LLC cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.