SAFETY DATA SHEET

1. Identification

Product identifier **Sulfuric Acid, Fuming (Oleum less than 30%)(100-106.7%)**

Other means of identification

SDS number 130000026355

Recommended use Raw material. Chemical intermediate.

Recommended restrictions 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.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company Name Veolia North America Regeneration Services LLC

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

Telephone 1-800-441-9362

Website veolianorthamerica.com/resources/sds

Emergency phone 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, dermal	Category 4
	Acute toxicity, inhalation	Category 4
	Skin corrosion/irritation	Category 1A
	Serious eye damage/eye irritation	Category 1
	Carcinogenicity	Category 1A
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, repeated exposure	Category 2 (respiratory system, teeth)
Environmental hazards	Hazardous to the aquatic environment, acute hazard	Category 3
	Hazardous to the aquatic environment, long-term hazard	Category 3

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement May be corrosive to metals. Harmful in contact with skin. Harmful if inhaled. Causes severe skin burns and eye damage. May cause cancer. May cause respiratory irritation. May cause damage to organs (respiratory system, teeth) through prolonged or repeated exposure by inhalation. Harmful to aquatic life with long lasting effects.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep only in original container. Do not breathe mist or vapor. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face 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 in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If inhaled: Remove person to fresh air and keep comfortable for breathing. Immediately call a poison center/doctor. Absorb spillage to prevent material damage. If exposed or concerned: Get medical advice/attention.
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	None.

3. Composition/information on ingredients

Mixtures

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

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. 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.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed. Combustion products include: Sulfur oxides.
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. 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 original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS). Protect containers from damage. Never allow product to get in contact with water during storage. Store in a cool, dry place out of direct sunlight. Store in a corrosive resistant container.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits 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

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

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 (typically 10 air changes per hour) 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	Use a NIOSH-approved respirator as appropriate.
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	50 °F (10 °C) at 760 mm Hg
Initial boiling point and boiling range	287.6 °F (142 °C) at 760 mm Hg
Flash point	No applicable data avaliable.
Evaporation rate	< 1 (Butyl Acetate = 1.0)
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	3 - 6 mm Hg (25 °C / 77°F) 6 - 13 mm Hg (37.7°C/ 99.9°F)
Vapor density	ca. 3 (Air = 1.0)
Relative density	1.839 - 1.9 at 16 °C (61°F)
Solubility(ies)	
Solubility (water)	Completely soluble. Reacts violently with water liberating sulfuric acid mist cloud.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Explosive properties	Not explosive.

10. Stability and reactivity

Reactivity	Reacts violently with water. Reacts violently with strong alkaline substances. This product may react with reducing agents. Contact with metal may release flammable hydrogen gas.
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. Metals. 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	Harmful if inhaled. May cause respiratory irritation. May cause damage to organs through prolonged or repeated exposure by inhalation.
Skin contact	Causes severe skin burns. Harmful in contact with skin.
Eye contact	Causes serious eye damage.
Ingestion	Causes digestive tract burns. May be harmful 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. Prolonged exposure to sulfuric acid mist may cause cancer.

Information on toxicological effects

Acute toxicity May be harmful if swallowed. Harmful in contact with skin. Harmful if inhaled.

Components	Species	Test Results
Sulfur trioxide (CAS 7446-11-9)		
Acute		
Inhalation		
Aerosol		
LC50	Rat	0.375 mg/l, 4 Hours
Sulfuric acid (CAS 7664-93-9)		
Acute		
Dermal		
LD50	Rabbit	2000 mg/kg
Oral		
LD50	Rat	2140 mg/kg

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	May cause cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Oleum (CAS 8014-95-7)	1 Carcinogenic to humans.
Sulfur trioxide (CAS 7446-11-9)	1 Carcinogenic to humans.

NTP Report on Carcinogens

Oleum (CAS 8014-95-7)	Known To Be Human Carcinogen.
Sulfur trioxide (CAS 7446-11-9)	Known To Be Human Carcinogen.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

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	May cause damage to organs (respiratory system, teeth) through prolonged or repeated exposure by inhalation.
Aspiration hazard	Not an aspiration hazard.

12. Ecological information

Ecotoxicity Harmful to aquatic life with long lasting effects. 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			
Crustacea	EC50	Daphnia magna	29 mg/l, 24 Hours
Fish	LC50	Lepomis macrochirus	16 - 28 mg/l, 96 Hours
Chronic			
Crustacea	NOEC	Invertebrates (Invertebrates)	0.15 mg/l
Fish	NOEC	Brook trout (Salvelinus fontinalis)	0.13 mg/l

Persistence and degradability The product is not expected to be readily biodegradable.

Bioaccumulative potential The product is not expected to bioaccumulate.

Mobility in soil This product is miscible in water.

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

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 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).

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 -
Label(s) 8
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.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Oleum (CAS 8014-95-7)	LISTED
Sulfuric acid (CAS 7664-93-9)	LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

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

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)
Sulfuric acid	7664-93-9	1000	1000		
Sulfur trioxide	7446-11-9	100	100		
Oleum	8014-95-7	1000	1000		

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Sulfuric acid	7664-93-9	70 - 100

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)

Oleum (CAS 8014-95-7)
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

Oleum (CAS 8014-95-7)	6552
Sulfuric acid (CAS 7664-93-9)	6552

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

Oleum (CAS 8014-95-7)	20 %WV
Sulfuric acid (CAS 7664-93-9)	20 %WV

DEA Exempt Chemical Mixtures Code Number

Oleum (CAS 8014-95-7)	6552
Sulfuric acid (CAS 7664-93-9)	6552

US state regulations WARNING: This product contains a chemical known to the State of California to cause cancer.

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

Oleum (CAS 8014-95-7)
Sulfur trioxide (CAS 7446-11-9)
Sulfuric acid (CAS 7664-93-9)

US. Massachusetts RTK - Substance List

Oleum (CAS 8014-95-7)
Sulfur trioxide (CAS 7446-11-9)
Sulfuric acid (CAS 7664-93-9)

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

Oleum (CAS 8014-95-7)
Sulfur trioxide (CAS 7446-11-9)
Sulfuric acid (CAS 7664-93-9)

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

Oleum (CAS 8014-95-7)
Sulfur trioxide (CAS 7446-11-9)
Sulfuric acid (CAS 7664-93-9)

US. Rhode Island RTK

Oleum (CAS 8014-95-7)
Sulfuric acid (CAS 7664-93-9)

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
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	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).
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 26-July-2017
Revision date -
Version # 01

NFPA ratings

Disclaimer

Veolia North America Regeneration Services 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.