Rooto Corporation
3505 W. Grand River Ave.
Howell, MI 48843
(517) 546-8330

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION 1069, 1071, 1079, 1084

PRODUCT NAME: Professional Drain Opener

CHEMICAL NAME: Sulfuric Acid Mixture: Grades; Commercial (93.19) CAS NO. 7664-93-9

DESCRIPTION: A clear to amber, heavy, oily liquid which may have a sharp penetrating SO_2 odor. RTECS NO. N/A

Other Designation	Manufacturer	Emergency Procedure
Drain Cleaner	Rooto Corporation 3505 W. Grand River Ave. Howell, MI 48843	Contact a physician, or the Poison Control Center immediately.

II. PHYSICAL PROPERTIES

Physical State: Liquid **Odor Threshold:** No data
Boiling Point: 93.19%: 27 6° C (529 ° F)
Melting/Freezing Point: 93.19%
-29.5 ° C (-21.1° F)
Vapor Pressure at 40° C (102 ° F) : 93.19%: 0.0016 mmHg
Specific Gravity at 15 ° C (60° F): 93.19%: 1.8354
Vapor Density: No data, not volatile at normal temperatures
Bulk Density: Not applicable (see specific gravity).
Evaporation Rate: Not applicable
Solubility: Miscible in all proportions in water. Also soluble in alcohol.
% Volatile by Volume: 0% at room temperature.
pH: 0.3 (1N solution at 25 ° C/78 ° F)

III. FIRE AND EXPLOSION DATA

Flash Point (method): Not applicable, product is non-flammable
Autoignition Temperature: Not combustible
Flammability Limits in air (%): UEL: Not applicable LEL: Not applicable
Fire Extinguishing Media: Use appropriate media to extinguish source of fire. Use water carefully (see below).
Fire Fighting Procedures: Fire involving small amount of combustibles may be smothered with suitable dry chemical. Use water on combustibles burning in vicinity of this material but use care; water applied directly will cause evolution of heat and cause spattering. Full protective equipment including a self-contained breathing apparatus should be worn.
Other Fire or Explosion hazards: Not flammable but highly reactive; capable of igniting finely divided combustible materials on contact. Reacts violently with water and organic materials with evolution of heat. Extremely hazardous in contact with many materials, particularly carbides, chlorates, fulminates, nitrates, picrates, powdered metals, releasing hydrogen. Hydrogen gas can accumulate to explosive concentrations inside confined spaces.
Sensitivity to Chemical Impact: No data Rate of Burning: No data
Explosive Power: No data Sensitivity to Static Discharge: No data

IV. REACTIVITY DATA

Stability: Under Normal Conditions: Stable
Under Fire Conditions: Decomposes to SO_x
Hazardous Polymerization: Will not occur
Conditions to Avoid: Temperatures which may have a negative effect on the materials of construction used in equipment.
Materials to Avoid: Contact with organic materials (such as chlorates, carbides, fulminates and picrates) May cause fire and explosions. Contact with metals may produce flammable hydrogen gas.
Hazardous Decomposition of Combustion Products: Toxic gases and vapors (e.g. sulfur dioxide, sulfuric acid vapors and sulfur trioxide) may be released when sulfuric acid decomposes.

V. TOXICOLOGICAL AND HEALTH DATA

Recommended Exposure Limit: ACGIH TLV-TWA (1987-88): 1 mg/m³
OSHA PEL (1989): 1 mg/m³
Toxicological Data: LD_{50} (oral, rat) = 2140 mg/kg
LC_{50} (inhalation, rat) = 510 mg/m³ for 2 hrs.
Carcinogenicity Data: This product is not classified by NTP (National Toxicology Program), not regulated as carcinogenic by OSHA (Occupational Safety and health Administration), and has not been evaluated by IARC (International Agency for Research on Cancer) or ACGIH (American Conference of Governmental Industrial Hygienists).
Reproductive Effects: No information is available and no adverse reproductive effects are anticipated. **Mutagenicity Data:** No information is available and no adverse mutagenic effects are anticipated. **Teratogenicity Data:** No information is available and no adverse teratogenic effects are anticipated. **Synergistic Materials:** None known.
Effects of exposure when: 1) Inhaled: Mists and vapors may cause irritation of the eyes, nose and respiratory tract. May cause increased pulmonary resistance, transient cough and bronchoconstriction. Severe overexposure may result in lung collapse and pulmonary edema which can be fatal. Prolonged or repeated exposure may result in impaired lung function and possible discoloration and erosion of teeth. 2) In contact with the skin: Concentrated solution may cause pain and severe burns to the skin and brownish or yellow stains. Prolonged and repeated exposure to dilute solutions may cause irritation, redness, pain and

VI. PRODUCT IDENTIFICATION

HAZARD SUMMARY (29 CFR 1910.1200)
Physical Hazards: Oxidizer, Water-reactive
Health Hazards: Corrosive
Product Synonyms: Oil of Vitriol, Sulphuric Acid
Chemical Family: Inorganic acid **Molecular Formula:** H_2SO_4
WHMIS Classification: Class E - Corrosive, Class d1A - Very Toxic
Product Use: Used in manufacture of drain care products.

SHIPPING DESCRIPTION:

U.S. (Under D.O.T.)	CANADA (Under T.C.)
Shipping Name: RQ Sulfuric Acid	Sulfuric Acid
Hazard Class: Corrosive Material	Shipping Class/Division: Class 8 (9.2)
Product I.D. No.: UN1830	Product I.D. No(PIN): UN183(Packing Group: II

HAZARDOUS INGREDIENTS OF MATERIALS:

Hazardous Ingredients	%	ACGIH TLV	OSHA PEL
Sulfuric Acid	60-100	1 mg/m³	1 mg/m³

V. TOXICOLOGICAL AND HEALTH DATA CONT.

drying and cracking of the skin. 3) In contact with the eyes: Immediate pain, severe burns and permanent corneal damage which may result in blindness. 4) Ingested: Severe burning and pain in the mouth, throat and abdomen. Vomiting, diarrhea and perforation of the esophagus and stomach lining may occur. 5) Other Health Effects: Corrosive effects on the skin and eyes may be delayed and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential.

First Aid Procedures when:

Inhaled: Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give Cardiopulmonary Resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical attention IMMEDIATELY.

In contact with the skin: Flush skin with running water for a minimum of 20 minutes. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim unless the recommended flushing period is complete unless flushing can be continued during transport.

In contact with the eyes: Immediately flush eyes with running water for a minimum of 20 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is complete unless flushing can be continued during transport.

Ingested: If victim is alert and not convulsing, rinse out mouth and give 1/2 to 1 glass of water to dilute material. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY contact local poison control center. Vomiting may need to be induced but should be directed by a physician or a poison control center. IMMEDIATELY transport victim to an emergency facility.

Note to Physician: Medical conditions that may be aggravated by exposure include asthma, bronchitis, emphysema and other lung diseases and chronic nose, sinus or throat conditions. In the event of skin or eye contact, rapid and thorough flushing is essential.

VI. PREVENTATIVE MEASURES

Recommendations listed in this section indicate the type of equipment which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls: Local exhaust ventilation required.

Respiratory protection: ANIOSH/MSHA approved air-purifying respirator equipped with acid gas/fume, dust, mist cartridges for concentrations up to 10 mg/m³. An air-supplied respirator if concentrations are higher or unknown.

Skin Protection: Impervious (i.e. neoprene, PVC) gloves, coveralls, boots and/or other acid resistant protective clothing.

Eye Protection: Safety glasses or tight-fitting chemical goggles.

Other Personal Protective Equipment: Where there is a danger of spilling or splashing, acid resistant aprons or suits should be worn. Trouser legs should be worn outside (not tucked in) rubber boots. Safety showers and eyewash fountains should be installed in storage and handling areas.

Handling Procedures and Equipment: Carbon steel or stainless steel materials are suitable for use for acid concentrations equal to or greater than 93%. However, the effect of lower concentrations on the materials of construction can be very complex. Contact product supplier for specific recommendations when handling sulfuric acid at strengths less than 77%.

Storage Temperature: Store above freezing point (Section 2). Elevated temperatures will increase the corrosion rate of most metals.

Storage Requirements: Store packaged acid in a dry, well-ventilated location away from combustibles, oxidizers, bases, or metallic powders. Storage tanks should be protected from water ingress, be well ventilated, and maintained structurally in a safe and reliable condition.

Other Precautions: Keep away from ignition sources. Sulfuric acid will attack some forms of plastics and coatings. Always add acid to water - not water to acid. If kept in upper floors of building, floors should be acid proof with drains to a recovery tank.

VII. ENVIRONMENTAL PROTECTION DATA

Steps to be taken in the event of a spill or leak: Remove all ignition sources. Ventilate area. Stop or reduce leak if safe to do so. Dike with inert material (sand, earth, etc.). Collect into containers for reclaim or disposal.

Environmental Effects: Harmful to aquatic life in very low concentrations. May be dangerous if it enters water intake; fish toxicity critical concentration = 10 mg/L; 7.34 mg/L/48 hrs. - Lymneae Palustris - 0-100% mortality.

Deactivating Chemicals: Lime, limestone, sodium carbonate (soda ash), sodium bicarbonate, dilute sodium hydroxide, dilute aqua ammonia.

Waste Disposal Methods: Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste with normal garbage.

VIII. ADDITIONAL INFORMATION AND SOURCES USED

1. MARSULEX Technical Bulletin, "Sulfuric Acid"
2. Enviro-TIPS Manual, "Sulfuric Acid and Oleum", Environment Canada, February, 1984.