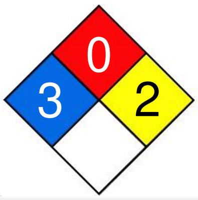

Material Safety Data Sheets

Revision 2

1. IDENTIFICATION

Product Name	**Sulphuric Acid 95-98% Extra pure**
Other Names	Dihydrogen Sulfate; Dipping Acid; Fertilizer Acid; Hydrogen Sulphate; Oil of Vitriol; SULFURIC ACID; Sulfuric Acid
Code No	100-SA-2
Uses	Chemical Reagent, Electroplating, Fertilizer Manufacture, laboratory reagent, pickling and anodizing metals.
Chemical Family	No Data Available
Chemical Formula	H_2SO_4
Chemical Name	Sulphuric Acid
Product Description	No Data Available
Company	Arman sina.co
Contact Information	info@armansina.com www.armansina.com

2. HAZARD IDENTIFICATION

Hazard Categories	Corrosive
Risk Phrases	Causes severe burns. Risk of serious eye damage.
Safety Phrases	Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Never add water to this product. Wear suitable protective clothing, gloves and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show

Symbol

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Sulphuric Acid	H_2SO_4	7664-93-9	95-98%
Water	H_2O	7732-18-5	BALANCE %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	If swallowed, do NOT induce vomiting. Seek medical attention immediately. For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor (at once).
Eye	If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor.
Inhaled	If inhaled, remove from contaminated area. To protect rescuer, use a Full-face Type B (Inorganic and acid gas) respirator or an Air-line respirator (in poorly ventilated areas). Apply artificial respiration if not breathing.
Advice to Doctor	Treat symptomatically based on judgement of doctor and individual reactions of patient. Can cause corneal burns.
Medical Conditions Aggravated by Exposure	No information available on medical conditions aggravated by exposure to this product.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, remove containers from the path of fire. Evacuate area and contact emergency services.
Flammability Conditions	Product is a non-flammable liquid.
Extinguishing Media	For large fires, flood fire area with large quantities of water while knocking down vapours with water fog. If there is insufficient water supply, knock down vapours only. For small fires, use Carbon dioxide, dry chemical, dry sand or flooding quantities of water. Toxic gases may be evolved in a fire situation. Remain upwind and notify those downwind of hazard. If tanks or containers are involved in the fire, cool them with copious quantities of water until well after the fire is out. Do not allow water to get inside tanks or containers. Withdraw immediately from the fire area if the tanks discolour or there is a rising sound from the safety vents. Stay away from tank ends. Use an extinguishing agent suitable for the surrounding fire including water spray, foam, carbon dioxide or dry chemical powder.
Fire and Explosion Hazard	The product is non-combustible but will support combustion of other materials and may emit toxic fumes including those of sulphuric acid fumes and sulphur dioxide. The packaging material may burn to emit noxious fumes. Reacts with most common metals to liberate hydrogen which can form explosive mixtures with air.
Hazardous Products of Combustion	May evolve toxic gases (sulphur oxides) when heated to decomposition. May evolve flammable hydrogen gas in contact with some metals.
Special Fire Fighting Instructions	Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.
Personal Protective Equipment	Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit. Please note: Structural fire fighters uniform will provide limited protection.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	2P

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Avoid accidents, clean up immediately. May be slippery when spilt. Eliminate all sources of ignition. Increase ventilation. Isolate the danger area. Use clean, non-sparking tools and equipment. Shut off all possible sources if ignition.
Clean Up Procedures	affected area with copious (flooding) quantities of water, so as to rapidly dilute the acid. Collect rinse water. Contact emergency services if appropriate for large spills, e.g. where acid has pooled. Do not enter area, walk though spilled material or touch damaged containers. Restrict access downwind and for at least 25 metres in other directions, unless appropriate PPE is worn. Ventilate area where possible. If safe to do so, stop the leak. If the spill is uncontained, consider constructing an earthen bund to prevent loss to waterways and drains. Pump up spilt acid using acid resistant equipment into suitable dry containers. Vapour suppressing foam may be used to control vapours, water spray to knock down or divert vapour clouds. Do not direct streams of water at spilt acid or allow

	water to enter containers. On impervious floors and in bunded areas, neutralize residual acid with Soda Ash. The resultant reaction product, sodium sulfate, is water soluble. The use of liming materials, e.g. calcium carbonate, oxide or hydroxide, is generally not recommended as the reaction product, calcium sulfate or gypsum, is sparingly soluble. The slurry is difficult to hose, pump and remove. Where Soda Ash is used, it may also be left to dry and be scraped up. Liming materials may be preferred to neutralize spills in the open to soil, as calcium sulfate has less impact on the soil and local environment than sodium sulfate. Depending on the magnitude of the spill, the neutralization of spills to soil may not be necessary if the soil is alkaline, e.g. calcareous soils in semi-arid areas. As an alternative to neutralization, residual acid can be soaked up with dry earth, sand, vermiculite or other inert absorbent material. Do not use sawdust. Where appropriate, cover with plastic sheeting to minimize spreading or contact with rain and collect for complete neutralisation and disposal.
Containment	Stop leak if safe to do so.
Decontamination	To avoid violent reactions, always add acid to water and never water to acid. When cleaning up residual acid after a spill, use copious (flooding) quantities of water from the outset, to provide rapid dilution.
Environmental Precautionary Measures	Do not allow product to reach drains, sewers or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Authority.
Evacuation Criteria	Do not enter area, walk though spilled material or touch damaged containers. Restrict access downwind and for at least 25 metres in other directions, unless appropriate PPE is worn. Ventilate area where possible.

7. HANDLING AND STORAGE

Handling	This acid is very reactive, and any contamination, including water, is potentially hazardous. The addition of water to concentrated inorganic acids generates heat, causing the water to boil violently in the area of mixing, splattering the acid. Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Take precautionary measures against static discharges by bonding and grounding equipment. Avoid contact with eyes, skin and clothing. Do not inhale product vapours. Avoid prolonged or repeated exposure. Do not combine part drums of the same product, as this may be a source of contamination. Do not mix with other chemicals. Keep dry reacts with water; may lead to drum rupture.
Storage	Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in section 10. Store in secured, cool, dry, well ventilated area, removed from oxidising agents, alkalis (bases), most metals, sunlight, heat or ignition sources and foodstuffs. Do not place in aluminium or galvanized containers. Ensure containers are adequately labelled and protected from physical damage when not in use. Check regularly for leaks or spills. Large storage areas should have appropriate fire protection and ventilation systems. This product has a UN classification of 1830 and a Dangerous Goods Class 8 (Corrosive) according to The Australian Code for the Transport of Dangerous goods By Road and Rail.
Container	Container type/packaging must comply with all applicable local legislation. Store in original packaging as approved by manufacturer.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	The following exposure standard has been established by The Safe Work Australia (SWA); Sulphuric Acid CAS 7664-93-9: TWA = 1 mg/m3 STEL = 3 mg/m3 NOTE: The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.
Exposure Limits	No Data Available
Biological Limits	No information available on biological limit values for this product.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Adequate ventilation should be provided so that exposure limits are not exceeded. Use a corrosion-resistant ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside. Use local exhaust ventilation, and process enclosure if necessary, to control airborne spray/ mists. Supply sufficient air to make up for air removed by exhaust systems.
Personal Protection Equipment	RESPIRATOR: Where risk assessment shows air-purifying respirators are appropriate use a Full Facepiece Gas Mask/Chemical Cartridge Respirators as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards (AS1715/1716). EYES: Tightly fitting safety goggles. Faceshield (8-inch minimum). Use equipment for eye protection tested and approved under appropriate government standards (AS1336/1337). HANDS: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product (AS2161). HANDS: Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. (AS2161). CLOTHING: Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. (AS3765/2210).

Full contact
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
890 / Aldrich Z677698, Size M)
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.2 mm
Break through time: 30 min
743 / Aldrich Z677388, Size M)

Work Hygienic Practices	Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Clear Liquid
Odour	Slight odour
Colour	Colorless to brown
pH	No Data Available
Vapour Pressure	No Data Available
Relative Vapour Density	3.39 Air = 1
Boiling Point	310ºC
Melting Point	-15ºC
Freezing Point	No Data Available
Solubility	Soluble
Specific Gravity	1.84
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	1.84 g/ml Relative
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available

Additional Characteristics	Surface tension 55.1 mN/m at 20 Relative vapour density 3.39 - (Air = 1.0) When mixing acids with water (diluting), caution must be taken as heat will be generated which causes violent spattering. Always add a small volume of acid to a large volume of water, NEVER the reverse. RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary. PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made. HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.
Potential for Dust Explosion	Product is a liquid.
Fast or Intensely Burning Characteristics	No Data Available
Flame Propagation or Burning Rate of Solid Materials	No Data Available
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No Data Available
Properties That May Initiate or Contribute to Fire Intensity	No Data Available
Reactions That Release Gases or Vapours	Reacts with most metals generating flammable/explosive hydrogen gas.
Release of Invisible Flammable Vapours and Gases	No Data Available

10. STABILITY AND REACTIVITY

General Information	Corrosive liquid. Corrosive to many metals with the liberation of extremely flammable hydrogen gas.
Chemical Stability	Potential for exothermic hazard. Can react violently, releasing heat, when mixed with water and strong alkalis (bases). May evolve flammable, and when confined, explosive hydrogen gas in contact with some metals.
Conditions to Avoid	Can act as an oxidizer with some organic compounds. Has a strong affinity for water. Reacts violently with water generating large quantities of heat. Contact with hypochlorites (swimming pool sodium or calcium hypochlorite) liberates toxic chlorine gas. contact with cyanide's releases toxic hydrogen cyanide gas. Contact with sulphides and carbides releases toxic and corrosive gases. Reacts violently with strong bases, amines and other alkaline.
Materials to Avoid	Bases, Halides, Organic materials, Carbides, fulminates, Nitrates, picrates, Cyanides, Chlorates, alkalihalides, Zinc salts, permanganates, e.g. potassium permanganate, Hydrogen peroxide, Azides, Perchlorates., Nitromethane, phosphorous, Reacts violently with:, cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phosphorous(III) oxide, Powdered metals.
Hazardous Decomposition Products	May evolve toxic gases (sulphur oxides) when heated to decomposition. May evolve flammable hydrogen gas in contact with some metals. Corrosive to many metals with the liberation of extremely flammable hydrogen gas.
Hazardous Polymerisation	Polymerization is not expected to occur. Exothermic reaction with water may result in violent spattering. Corrosive to most metals liberating flammable hydrogen gas.

11. TOXICOLOGICAL INFORMATION

General Information	Oral LD50 Rat: 2140 mg/Kg Inhalation LC50/2hr Rat: 510 mg/m3 LC50 (inhalation) 18 mg/m (guinea pig) LD50 (ingestion) 2140 mg/kg (rat) TCLo (inhalation) 3 mg/m 24 weeks (human) Unreported Route LDLo (man) 135 mg/kg Eye Irritation (Rabbit) 5 mg/30S rinse (Severe)

	Highly corrosive. This product has the potential to cause serious adverse health effects. Use safe work practices to avoid eye or skin contact and inhalation. Over exposure may result in severe skin, eye and respiratory burns with permanent lung and tissue damage. Upon dilution, the potential for adverse health effects may be reduced. Strong inorganic acid mists containing sulphuric acid is classified as carcinogenic to humans (IARC Group 1). Occupational exposures to strong inorganic acid mists containing sulfuric acid are specifically associated with laryngeal and lung cancer in humans. For the component Sulphuric acid: Repeated overexposure may lead to chronic conjunctivitis, lung damage and dental erosion. The International Agency for Research on Cancer (IARC) have concluded that occupational exposure to strong inorganic acid mists containing sulphuric acid is carcinogenic to humans, causing cancer of the larynx and to a lesser extent, the lung. No direct link has been established with sulphuric acid, itself, and cancer in humans. Exposure to any mist or aerosol during the use of this product should be avoided and exposure should not exceed the exposure standard.
EyeIrritant	Corrosive to eyes and may injure the cornea. Contamination of eyes can result in permanent injury. Symptoms include stinging, tearing, redness and swelling of eyes, lacrimation, corneal burns and possible permanent damage.
Ingestion	Highly corrosive. Ingestion may result in burns to the mouth and throat, nausea, vomiting, abdominal pain and diarrhoea. Ingestion of large quantities may result in ulceration, unconsciousness, convulsions and death.
Inhalation	Highly corrosive - severe irritant. Over exposure may result in mucous membrane irritation of the respiratory tract, coughing, bronchitis, ulceration, bloody nose, lung tissue damage, chemical pneumonitis, pulmonary oedema and death.
SkinIrritant	Corrosive to skin - may cause skin burns. May not produce an immediate burning sensation upon contact, delaying the awareness that contact has occurred. Symptoms may include redness, burning, and swelling of skin, burns, and other skin damage.
Carcinogen Category	No Data Available

12. ECOLOGICAL INFORMATION

Ecotoxicity	Fish, fresh water: Gambusia affinis LC50/96hr: 42 mg/L Crustacean: Pandalus montagui (Pink shrimp) EC50/48hr: 42.5 mg/l Mosquito fish LC50 42 mg/L/96hr Shore Crab LC50 70 - 80 mg/L/48hr Hooknose fish LC50 80-90 mg/L/48hr Cockle LC50 200 - 500 mg/l/48hr
Persistence/Degradability	Rapidly Degradable: YES
Mobility	No information available on mobility for this product. Sulphuric acid is miscible with water and its dilution will increase the velocity of downward movement in the soil where it may dissolve the soil material.
Environmental Fate	Do NOT allow product to enter waterways, drains or sewers. The product is highly acidic. If large spills occurred a water pH drop could be responsible for an environmental effect on aquatic organisms. Sulphuric acid is harmful to aquatic life in very low concentrations. May cause corrosion and deterioration of many common materials found in the environment (eg steel, limestone).
Bioaccumulation Potential	Bioccumulative: NO
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of in accordance with all local regulations. All empty packaging should be disposed of in accordance with Local Regulations or recycled/reconditioned at an approved facility. Reuse or recycle if possible. Contaminated acid and concentrated acidic wash down water can be neutralised to pH 6-8 by the SLOW addition of the waste to a saturated basic solution containing up to 20% sodium carbonate (Soda Ash) or 10% sodium bicarbonate. The order of mixing is not critical for dilute or weak wash down water, i.e. the dilute acid can be added to the basic solution, or vice versa. contaminated soil and other sorbent materials can be neutralized with a solution of sodium carbonate or sodium bicarbonate, a dry liming material such as Hydrated Lime (calcium hydroxide), or any other suitable neutralizing agent. Collect neutralized waste for disposal. Containers pose a hazard when empty and must be treated as still containing acid until thoroughly rinsed. Empty containers can be decontaminated with a 5% aqueous solution of Soda Ash or sodium bicarbonate, and then rinsing again with water. Waste disposal should only be undertaken in a well ventilated area. Contact Waste Management Authority for advice on whether waste needs to be treated as hazardous, or requires further dilution, neutralization or treatment, and acceptable disposal methods.
Special Precautions for Land Fill	Contact a specialist disposal company or the local waste regulator for advice. The product is suitable for disposal by landfill through an approved agent. Incineration of the product is not recommended, as it is unlikely to adequately burn.

14. TRANSPORT INFORMATION

Land Transport

Proper Shipping Name	SULPHURIC ACID with more than 51% acid
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	137 Substances - Water-Reactive - Corrosive
UN Number	1830
Hazchem	2P
Pack Group	II
Special Provision	No Data Available

Sea Transport
IMDG

Proper Shipping Name	SULPHURIC ACID with more than 51% acid
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1830
Hazchem	2P
Pack Group	II
Special Provision	No Data Available
EMS	FA,SB
Marine Pollutant	No

Air Transport
IATA

Proper Shipping Name	SULPHURIC ACID with more than 51% acid
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1830
Hazchem	2P
Pack Group	II
Special Provision	No Data Available

15. OTHER INFORMATION

Revision	2
Key/Legend	< Less Than > Greater Than atm Atmosphere CAS Chemical Abstracts Service (Registry Number) cm Square Centimetres CO2 Carbon Dioxide COD Chemical Oxygen Demand Degrees Celcius Degrees Farenheit g Grams g/cm Grams per Cubic Centimetre g/l Grams per Litre

HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health
immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH2O Inch of Water
K Kelvin
kg Kilogram
kg/m Kilograms per Cubic Metre
lb Pound
LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or L Litre
m Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m Milligrams per Cubic Metre
Misc or Miscible Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight