Dominant® | SAFETY DATA SHEET

Date of Issue: 15 December 2016

Sulfuric Acid

1. IDENTIFICATION OF MATERIAL AND SUPPLIER

Product Name	Sulfuric Acid
Code	40394, C25017
Product Use	To neutralise alkaline residues in water treatment plants
Company Name	Dominant (Australia) Pty Ltd
Address	12 Coglin Street, Brompton SA 5007, Australia
Telephone	1300 789 852 or +61 (8) 8245 6900
Facsimile	+ 61 (8) 8340 1626
Emergency Phone	13 11 26

2. HAZARDS IDENTIFICATION

GHS Classification

Eye Damage 1
Skin Corrosion 1A
Metal Corrosion 1

Signal Word

DANGER

Hazard Statements

Causes severe skin burns and eye damage
May be corrosive to metals

Precautionary Statements

Keep out of reach of children. Do not breathe fume / gas / mists / vapours / spray.

Wear protective gloves/ protective clothing/ eye protection/face protection.

Store locked up. Keep only in original container.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician.

IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or doctor/physician.

Dispose of contents/container in accordance with state regulations

Pictograms

Product Name: Sulfuric Acid

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients	Name	CAS	Proportion
	Sulfuric acid	7664-93-9	67%
	Water	7732-18-5	33%

4. FIRST AID MEASURES

Ingestion

Rinse mouth thoroughly with water immediately. Give plenty of water to drink. Never give anything by mouth to an unconscious person. If swallowed, do NOT induce vomiting. If vomiting occurs, have victim lean forward to reduce risk of aspiration. If vomiting occurs give further water to achieve effective dilution. Seek immediate medical assistance.

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. Take care not to rinse contaminated water into the non-affected eye. Seek immediate medical assistance.

Skin

If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. If possible, because of the high heat of dilution, quickly wipe residual acid off the skin before starting water wash. If irritation persists, repeat flushing. Do not interrupt flushing. Flushing immediately with water will generate a large amount of heat upon contact with sulfuric acid. Contaminated clothing must be washed before re-use. Decontaminate clothing, shoes and leather goods before re-use or discard. Seek urgent medical assistance.

Inhaled

Remove from exposure, rest and keep warm. If not breathing, give artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. Ensure airways are clear and have qualified person give oxygen through a face mask of breathing is difficult. Seek urgent medical attention.

First Aid Facilities

An eye wash fountain, drench facility and normal washroom facility should be available to the work area.

Advice to Doctor

Treat symptomatically as for strong acids. For advice contact a Poisons Information Centre. (Phone Australia 13 11 26; New Zealand 0800 764 766)

Protection for First Aiders

No action shall be taken involving any personal risk without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth to mouth resuscitation. Wash contaminated clothing thoroughly with water before removing or wear gloves.

Product Name: Sulfuric Acid

5. FIRE FIGHTING MEASURES

Extinguishing Media	Use extinguishing media most appropriate for the surrounding fire. When material is not involved in fire: Do not use water on material itself.
Hazards from Combustion	Highly irritating /toxic gases and fumes, including toxic oxides of Sulphur (SO*x*). Will react with water or steam to produce toxic and corrosive fumes and heat. Reacts with carbonates to generate carbon dioxide gas. Reacts with cyanides and sulphides to form poisonous hydrogen cyanide and hydrogen sulphide respectively. Hydrogen may form upon contact with metals (danger of explosion!)
Precautions for Fire Fighters	Does not burn but may produce poisonous and/or corrosive fumes upon heating. Heat of reaction may be enough to ignite combustible materials. Will react with water (some violently) releasing flammable, poisonous and/or corrosive gases and run off. Contact with metals may evolve flammable hydrogen gas. Fire may produce irritating, poisonous and/or corrosive gases. Run off may pollute waterways. May be transported in a molten form. Containers may explode when heated or contaminated with water. Wear SCBA and acid resistant chemical splash suit. Structural firefighter's uniform is NOT effective for this material.
Hazchem	2P

6. ACCIDENTAL RELEASE MEASURES

Spills and Disposal	Evacuate unprotected personnel from danger area. Neutralise with lime or sodium carbonate, adjust the pH to 6-10. For larger spills, notify Emergency Services.
Personal Protection	Wear protective clothing specified for normal operations (see Section 8)
Clean Up methods (Small Spillages)	Absorb or contain liquid with sand, earth or spill control material, or neutralize with sodium carbonate or other alkali material.

7. HANDLING AND STORAGE

Handling	Avoid ingestion and inhalation of gas/fumes/vapour/spray mist. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Keep locked up. Keep containers closed when not in use. Use only with adequate ventilation. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Wear suitable protective clothing. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Inform laundry personnel of contaminant's hazards. Discard contaminated shoes. Ensure a high level of personal hygiene is maintained when using this product, that is, always wash hands before eating, drinking, smoking or using the toilet facilities. Contact with water will generate heat. When diluting, always add the acid to water: never add water to the acid. Do not allow water to get into the container because of violent reaction.

Product Name: Sulfuric Acid

7. HANDLING AND STORAGE (Continued)

Storage	Ideally, sulfuric acid should be stored in isolation from all other chemicals in an approved acid or corrosives safety cabinet. Accessible only for authorized persons. Store in tightly closed containers, in a cool, dry well ventilated area with acid resistant floors and good drainage. Hygroscopic. Do not allow contact with water. Reacts violently with water. Protect against physical damage, freezing, direct sunlight and moisture. Store away from incompatible materials and water. May corrode metallic surfaces. Separate from acids, alkalis, oxidizing agents, reducing agents, combustibles, sources of ignition and heat. Do not wash out container and use it for other purposes. Containers of this material may be hazardous when empty since they retain product residues (vapours, liquids); observe all warning and precautions listed for the product. Inspect regularly for deficiencies such as damage or leaks.
Corrosiveness	Very corrosive to most metals including cast iron, steel, stainless steel, brass, aluminium, titanium, nickel, and some alloys. The corrosivity of sulfuric acid solutions depends on factors such as concentration, temperature and acid impurities. The resistance of alloys to sulfuric acid corrosion increases with increasing chromium, molybdenum, copper and silicon content. Many plastics do not resist concentrated acid well (greater than 50-60%). Teflon is the only common plastic that resists all acid concentrations.
Storage Regulations	Refer to Australian Standard AS 3780-1994 'The storage and handling of corrosive substances'
Storage Temperatures	Store at room temperature (15°C - 23°C recommended)

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards	Exposure standard for sulfuric acid: TWA 1 mg/m^3 STEL 3 mg/m^3
Engineering Controls	Provide sufficient ventilation to ensure that the work environment is below the TWA (time weighted average). In industrial situations maintain the concentrations below the TWA. This may be achieved by process modification, use of local exhaust ventilation, capturing substances at the source or other methods.
Respiratory Protection	Where ventilation is not adequate, respiratory protection may be required. Avoid breathing vapours or mists. Select and use respirators in accordance with AS 1716 – Respiratory Protective Devices and be selected in accordance with AS 1716 – Selection, Use and Maintenance or Respiratory Protective Devices. When mists or vapours exceed the exposure standards then the use of the following is recommended: Approved respirator with organic vapour and dust / mist filters. Filter capacity and respirator type depends on exposure levels.

Product Name: Sulfuric Acid

8. EXPOSURE CONTROLS / PERSONAL PROTECTION (Continued)

Eye Protection	The use of a face shield, chemical goggles or safety glasses with the side shield protection as appropriate. Must comply with AS 1337 and be selected and used in accordance with AS 1336.
Hand Protection	Hand protection should comply with AS 2161, Occupational protective gloves – Selection, use and maintenance. Recommendation: Excellent: Vinyl gloves. Good: Neoprene or nitrile rubber gloves. Fair: NR Latex (52-75%).
Footwear	Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear – Guide to selection, care and use.
Body Protection	Clean clothing or protective clothing should be worn, preferably with an apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection against Hazardous Chemicals.
Hygiene Measures	Always wash hands before smoking, eating or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Clear colourless viscous (thick oily) liquid. Odourless, but has a choking odour if heated.
Solubility in Water	Soluble in all proportions. Caution: always add acid to water. Exothermic reaction with water. Addition to water generates significant heat. Addition to water can generate localised boiling and spattering.
pH	Strongly acidic. 1 N solution (~5% w/w) = 0.3 0.1 N solution (~0.5% w/w) = 1.2 0.01 N solution (~0.05% w/w) = 2.1
Decomposition temperature	340°C (100%)
Melting Point	-38°C
Boiling Point	156°C
Specific Gravity	1.58
Vapour pressure	<0.04 kPa (0.3 mm Hg) at 25°C (100%)
Odour threshold	>1ppm (sulfuric acid 100%)
Viscosity	25 centipoise (25 mPa.s) at 25°C (100%)
Surface Tension	50 dynes/cm at 25°C (100%)
Molecular weight	98.08

Product Name: Sulfuric Acid

10. STABILITY AND REACTIVITY

Stability	Stable under normal temperatures, pressures and conditions of storage and handling. Concentrated solutions (>90%) react violently with water, spattering and liberating heat.
Conditions to Avoid	Exposure to moist air, moisture or water (Note: Use great caution in mixing with water due to heat evolution that causes explosive spattering. Always add the acid to water, never the reverse.), metals, excess heat, combustible materials, organic materials, oxidisers, amines, bases and incompatible materials.
Incompatible Materials	Water, combustible materials, oxidising agents, reducing agents, metals as powders, metals as non powders (yields hydrogen gas), metals as alloys, metal compounds, acids, alkalis, organic materials, organic solvents, alkali metals, alkaline earth metals, alkaline earth compounds, alkali hydroxide solutions, chlorates, perchlorates, permanganates, carbides, cyanides, nitrides, sulphides, fulminates, picrates, nitrates, nitriles, halogens, halogen-halogen compounds, salts of oxyhalogen acids, acetylides, oxides and hydrides, anilines, organic nitro compounds, peroxi compounds, acetic anhydride, acetone cyanhydrin, acetone + nitric acid, acetone + potassium dichromate, acrolein, allyl alcohol, allyl chloride, 2-aminoethanol, ammonia, ammonium triperchromate, n-butyraldehyde, diisobutylene, epichlorohydrin, ethylene cyanohydrin, ethylene diamine, ethylene glycol, ethylenimine, isoprene, lithium silicide, pentasilver trihydroxydiaminophosphate, phosphorous, phosphorous isocyanate, beta-propiolactone and pyridine.
Hazardous Decomposition Products	Irritating and highly toxic fumes and gases, including oxides of sulphur. Reaction with water or steam may generate much heat which will increase the concentration of the fumes in the air, and may produce toxic and corrosive fumes. Contact with most metals causes formation of flammable and explosive hydrogen gas.
Possibility of Hazardous Reactions	Very reactive substance. Corrosively attacks most metals liberating flammable hydrogen gas, (potential explosion). The concentrated acid oxidises, dehydrates, or sulphonates most organic compounds. Sulfuric acid reacts vigorously, violently or explosively with many organic and inorganic chemicals including water, acrylonitrile, alkali solutions, carbides, chlorates, fulminates, nitrates, perchlorates, permanganates, picrates, powdered metals, metal acetylides or carbides, epichlorohydrin, aniline, ethylenediamine, alcohols with strong hydrogen peroxide, chlorosulphonic acid, cyclopentadiene, hydrofluoric acid, nitromethane, 4-nitrotoluene, phosphorous (III) oxide, potassium, sodium, ethylene glycol, isoprene, styrene. Acetaldehyde and allyl chloride may polymerise violently in the presence of sulfuric acid. Many plastics do not resist concentrated acid well (greater than 50-60%). Hazardous gases, such as hydrogen cyanide, hydrogen sulphide and acetylene, are evolved on contact with chemicals such as cyanides, sulphides and carbides. Reacts with carbonates to generate carbon dioxide gas.
Hazardous Polymerisation	Acetaldehyde and allyl chloride may polymerise violently in the presence of sulfuric acid.

Product Name: Sulfuric Acid

11. TOXICOLOGICAL INFORMATION

Ingestion

Corrosive: Harmful if swallowed. Ingestion can cause severe burns to the mouth, throat, oesophagus and stomach and permanent damage to the digestive tract, resulting in discomfort and severe pain, extensive tissue damage, the danger of perforation of the oesophagus and stomach, gastrointestinal bleeding, oedema of the glottis, necrosis and scarring, and in severe cases, collapse and death. Symptoms may include sore throat, difficulty swallowing, intense thirst, general feeling of sickness, nausea, vomiting, diarrhoea, severe swelling of the larynx and skeletal paralysis affecting the ability to breathe, circulatory collapse, with clammy skin, weak and rapid pulse and shallow respiration, scanty urine, circulatory shock and convulsions and subsequent death. Circulatory shock is often the immediate cause of death. It may also cause systemic toxicity with acidosis. Small amounts of acid which may enter the lungs during ingestion or vomiting (aspiration) can cause serious lung injury and death. After a latency period of several weeks, possibly pyloric stenosis.

Inhalation

Corrosive: Harmful if inhaled. Because its vapour pressure is negligible, it exists in the air only as a mist or spray. Inhalation of mists, aerosols or sprays can cause severe irritation or corrosive damage to the respiratory tract and mucous membranes with sore throat, burning pain in the nose and throat, coughing, wheezing, laryngitis, bronchitis, shortness of breath, laboured breathing, dental erosion, headaches, nausea, and vomiting. Exposure may impair lung function and cause mucostasis (reduced mucous clearance). The degree and severity of respiratory affects are influenced by factors such as the physical state and particle size of the aerosol, deposition site, concentration and humidity. Long term lung damage may result from a severe short term exposure. Inhalation may be fatal as a result of spasm, inflammation, oedema of the larynx and bronchi, chemical pneumonitis, and delayed pulmonary oedema. The symptoms of pulmonary oedema, including coughing and shortness of breath, can be delayed until hours or days after the exposure and are aggravated by physical exertion. May affect cardiovascular system (hypotension, depressed cardiac output, bradycardia). Circulatory collapse with clammy skin, weak and rapid pulse, shallow respiration, and scanty urine may follow. Circulatory shock is often the immediate cause of death.

Skin

Corrosive. Causes severe skin irritation and burns, which may result in permanent scarring. Burns may be 2nd or 3rd degree. Extensive acid burns can result in death. Symptoms of redness, irritation, pain, blistering, tissue destruction, scabs, sloughs, local necrosis, and membrane ulceration can occur. Continued contact can cause tissue necrosis. High mist or aerosol concentrations may cause redness, irritation and burns to the skin if contact is prolonged. The severity of injury depends on the concentration of the solution and the duration of exposure. May be harmful if absorbed through the skin. May cause circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine. Circulatory shock is often the immediate cause of death.

Product Name: Sulfuric Acid

11. TOXICOLOGICAL INFORMATION

Eye	Corrosive. Can cause severe eye irritation and severe eye burns. Contact can cause blurred vision, redness, swelling, pain, corneal lesions, permanent corneal opacification and irreversible eye injury, including blindness. Risk of serious damage to the eyes. The severity of the injury depends on the concentration of the solution and the duration of exposure. Sulfuric acid mists and aerosols are expected to be irritating.
Carcinogenicity	Occupational exposure to strong inorganic acid mists containing sulfuric acid is evaluated in the IARC Monographs (Vol. 54; 1992) as Group 1: Carcinogenic to humans.
Chronic Effects	Prolonged or repeated inhalation may affect behaviour (muscle contraction or spasticity), urinary system (kidney damage), and cardiovascular system, heart (chest pain, ischemic heart lesions), and respiratory system/lungs (nosebleeds, nasal congestion, perforation of the nasal septum, bronchial hyperreactivity, bronchitis, pulmonary oedema, lung damage), teeth (dental discolouration, erosion). Exposure to high concentrations (reportedly up to 16 mg/m^3) cause dental erosion. Etching of teeth may occur after a few weeks exposure, progressing to erosion after a few months exposure. Dental etching and erosion occurred about 4 times as frequently in a high exposure group (over 0.3 mg/m^3) compared to a low exposure group (below 0.07 mg/m^3). Prolonged or repeated exposure to sulfuric acid mists may cause various lesions of the skin, tracheobronchitis, stomatitis, conjunctivitis, or gastritis. Prolonged or repeated skin contact may cause dermatitis (red, itchy, dry skin), an allergic skin reaction. Prolonged or repeated eye contact may cause conjunctivitis. Effects may be delayed. Occupational exposure to strong inorganic acid mists containing sulfuric acid is carcinogenic to humans.
Respiratory irritation	Human volunteers exposed to sulfuric acid for 5-15 minutes noticed no odour, or irritation below 1 mg/m3. All volunteers noticed the exposure at 3 mg/m^3 and at 5 mg/m^3 some people found it objectionable. A deep breath usually produced coughing and respiratory changes were reported. Tolerance to sulfuric acid can occur. In another study, volunteers exposed to high levels (39mg/m^3 dry mist and 21 mg/m^3 wet mist sulfuric acid) for ½ - 1 hour reported severe symptoms of irritation of the upper airways and signs of bronchial obstruction. These symptoms persisted for several days in two volunteers. Occupational exposure to sulfuric acid fumes in a closed space, produced injury to the upper airways, and fluid accumulation and bleeding in the lungs to one worker. Most lung function tests had returned to normal after 6 weeks.

Product Name: Sulfuric Acid

12. ECOLOGICAL INFORMATION

Ecotoxicity	Harmful effects on aquatic organisms. Harmful effect due to pH shift. Toxic effect on fish and algae. Does not cause biological oxygen deficit. Endangers drinking water supplies if allowed to enter soil and/or waters in large quantities. Neutralisation possible in waste water treatment plants.
Persistence and degradability	Methods for the determination of biodegradability are not applicable to inorganic substances.
Environmental protection	Do not allow to enter waters, waste water or soil!
Acute toxicity – Fish	L. macrochirus LC50: 16-29 mg/l/ 96h.
Acute toxicity – Daphnia	Daphnia magna EC50: 29mg/l/24 h (calculated on the pure substance)

13. DISPOSAL CONSIDERATIONS

Disposal considerations	Dispose of according to relevant local, state and federal government regulations.
Waste Disposal	Neutralise remaining product with lime or soda ash, adjusting pH to 6-10. Flush to sewer as a greatly diluted solution.

14. TRANSPORT INFORMATION

Transport Information	Dangerous Goods of Class 8 (Corrosive) are incompatible in a placard load with any of the following: Class 1, Class 4.3, Class 5, Class 6, if the Class 6 dangerous goods are cyanides and the Class 8 dangerous goods are acids, Class 7; and are incompatible with food and food packaging in any quantity.
UN No.	1830
Proper Shipping Name	SULFURIC ACID
Hazchem Code	2P
Class	8
Packaging method	3.8.8RT8
Packing Group	II
EPG Number	8A2
IERG Number	40

15. REGULATORY INFORMATION

Classification	Poisons Schedule: Schedule 6 according to the Poisons Standard March 2016 Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Product Name: Sulfuric Acid

16. OTHER INFORMATION

Contact Point	Dominant Australia. Phone 08 8245 6900 24 hour medical emergency 13 11 26
Date of preparation	8th April 2013