

Infosafe No™	1CHG3	Issue Date : April 2018	RE-ISSUED by ACR
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Product Name : **SULFURIC ACID 15-51%**

Classified as hazardous

1. Identification

GHS Product Identifier SULFURIC ACID 15-51%

Company Name AUSTRALIAN CHEMICAL REAGENTS (ACR) (ABN 19 008 264 211)

Address 38 - 50 Bedford Street Gillman
S.A. 5013 Australia

Telephone/Fax Number Tel: (08) 8440 2000
Fax: (08) 8440 2001

Recommended use of the chemical and restrictions on use Fertilizers, chemicals, dyes and pigments, etchant, alkylation catalyst, electroplating baths, iron and steel, rayon and film, industrial explosives, non-ferrous metallurgy, analytical reagent and laboratory reagent.

Other Names	Name	Product Code
	Sulphuric Acid 50% w/w AR	0587
	Sulphuric Acid 10N	0583
	Sulphuric Acid 15% w/w	0585
	Sulphuric Acid 20% w/v	1001
	Sulphuric Acid 20% w/v	5117
	Sulphuric Acid 25% v/v	0591
	Sulphuric Acid 25% w/v	1016
	Sulphuric Acid 25% w/w	4252
	Sulphuric Acid 27% w/w	2906
	Sulphuric Acid 30% w/v	5493
	Sulphuric Acid 30% w/w	0586
	Sulphuric Acid 34% w/v	3401
	Sulphuric Acid 3N	3746
	Sulphuric Acid 42.1%	4081
	Sulphuric Acid 4N	0085
	Sulphuric Acid 5.25N	3515
	Sulphuric Acid 50% v/v	0592
	Sulphuric Acid 5N	0086
	Sulphuric Acid 6N	4186
	Sulphuric Acid 8N	2838

Other Information EMERGENCY CONTACT NUMBER: +61 08 8440 2000
Business hours: 8:30am to 5:00pm, Monday to Friday.

Australian Chemical Reagents (ACR) does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon Australian Chemical Reagents (ACR) with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of Australian Chemical Reagents (ACR) is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

2. Hazard Identification

GHS classification of the substance/mixture Skin Corrosion/Irritation: Category 1A
Corrosive to Metals: Category 1

Signal Word (s) DANGER

Hazard Statement (s) H290 May be corrosive to metals.
H314 Causes severe skin burns and eye damage.

Pictogram (s) Corrosion

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Precautionary statement – Prevention

P234 Keep only in original container.
P260 Do not breathe fume/gas/mist/vapours/spray.
P264 Wash thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement – Response

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

Precautionary statement – Storage

P363 Wash contaminated clothing before reuse.

Precautionary statement – Disposal

P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P310 Immediately call a POISON CENTER or doctor/physician.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P390 Absorb spillage to prevent material damage.
P405 Store locked up.

P501 Dispose of contents/container to an approved waste disposal plant.

3. Composition/information on ingredients

Chemical Liquid

Characterization

Ingredients

<u>Name</u>	<u>CAS</u>	<u>Proportion</u>	<u>Hazard Symbol</u>	<u>Risk Phrase</u>
Water	7732-18-5	49-85 %		
Sulfuric acid	7664-93-9	15-51 %		

4. First-aid measures

Inhalation	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Consult a physician.
Ingestion	Rinse mouth thoroughly with water immediately, repeat until all traces of product have been removed. DO NOT INDUCE VOMITING. Seek immediate medical advice.
Skin	Immediately remove contaminated clothing and wash affected area with water for at least 15 minutes. Ensure contaminated clothing is washed before re-use. Seek immediate medical advice /attention.
Eye contact	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. Seek immediate medical assistance.
First Aid Facilities	Maintain eyewash fountain and drench facilities and normal washroom facilities in work area.
Advice to Doctor	Treat symptomatically based on judgement of doctor and individual reactions of the patient.
Protection for First Aiders	WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive.
Other Information	For advice, contact a Poisons Information Centre (Phone eg Australia 13 1126; New Zealand 0800 764 766) or a doctor.

5. Fire-fighting measures

Hazards from Combustion Products	Irritating and highly toxic fumes and gases, including oxides of sulfur. Reaction with water or steam may generate much heat which will increase the concentration of fumes in the air, and may produce toxic and corrosive fumes.
Specific Methods	Use extinguishing media most appropriate for the surrounding fire.
Specific hazards arising from the chemical	Material does not burn. Fire or heat will produce irritating, poisonous and/or corrosive gases. Containers may explode when heated. Contact with metals may evolve flammable hydrogen gas.
Hazchem Code	2R

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Decomposition Temp.	340 °C (sulfuric acid)
Precautions in connection with Fire	Wear SCBA and chemical splash suit. Fully-encapsulating, gas-tight suits should be worn for maximum protection. Structural firefighter's uniform is NOT effective for these materials.

6. Accidental release measures

Spills & 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 Precautions	Avoid inhalation, contact with skin, eyes and clothing.
Personal Protection	Wear protective clothing specified for normal operations (see Section 8) Do not allow unprotected near spillage.
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. Shovel up using non sparking tools and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum.
Clean-up Methods - Large Spillages	Seek expert advice on handling and disposal.
Environmental Precautions	Use appropriate containment to avoid environmental contamination. Avoid release to the environment.

7. Handling and storage

Precautions for Safe Handling	Corrosive liquid. May produce severe burns. Avoid ingestion and inhalation of gas/fumes/vapour/spray mist. Attacks skin and eyes. Avoid contact with eyes, skin, or clothing. Keep locked up. Keep containers tightly closed when not in use. Use only with adequate ventilation. If ingested, seek medical advice immediately and show the container or the label. Wear suitable protective clothing, gloves and eye/face protection when mixing and using. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. 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. Keep away from incompatibles such as oxidizing agents, combustible materials, organic materials, metals, acids, alkalis, moisture/water. Contact with water will generate heat. When diluting, always add the acid to water; never add water to the acid. May corrode metallic surfaces.
Conditions for safe storage, including any incompatibilities	Store in tightly closed containers, in a cool, dry, well-ventilated corrosives area with acid resistant floors. Store away from incompatible substances, such as water, alkaline substances, oxidizing agents, and reducing agents. Store away from combustible substances, sources of ignition and heat.
Corrosiveness	Extremely corrosive in presence of aluminium, of zinc (50% sulfuric acid). Concentrated acid is non-corrosive to lead and mild steel, but diluted acid attacks most metals. Highly corrosive in presence of steel, of copper (20% sulfuric acid). Slightly corrosive to extremely corrosive in presence of stainless steel(304), of stainless steel(316) (20-50% sulfuric acid). Corrosive to most metals in the presence of moisture, liberating explosive hydrogen gas.
Storage Regulations	Refer Australian Standard AS 3780-1994 'The storage and handling of corrosive substances'.
Storage Temperatures	Store at room temperature (15 to 23 °C recommended). Protect from freezing.

8. Exposure controls/personal protection

Occupational exposure limit values	Name	STEL		TWA		Footnote
		mg/m3	ppm	mg/m3	ppm	
	Sulfuric acid	3		1		
Other Exposure Information	A time weighted average (TWA) has been established for Sulphuric acid (Safe Work Australia) of 1 mg/m ³ . The corresponding STEL level is 3 mg/m ³ . The STEL (Short Term Exposure Limit) is an exposure value that should not be exceeded for more than 15 minutes and should not be repeated for more than 4 times per day. There should be at least 60 minutes between successive exposures at the STEL. 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.					
Appropriate engineering controls	Provide sufficient ventilation to ensure that the working environment is below the TWA (time weighted average). Where vapours or mists are generated, particularly in enclosed areas, and natural ventilation is inadequate, a flame proof exhaust ventilation system is required. Refer to AS 1940-The storage and					

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Respiratory Protection	handling of flammable and combustible liquids and AS 2430-Explosive gas atmospheres for further information concerning ventilation requirements. 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 1715 - Selection, Use and Maintenance of 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.
Eye Protection	The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards 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. Avoid skin contact when removing gloves from hands, do not touch the gloves outer surface. Dispose of gloves as hazardous waste.
Personal Protective Equipment	Final choice of personal protective equipment will depend on individual circumstances and/or according to risk assessments undertaken.
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. 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

Form	Liquid
Appearance	Clear, colourless liquid.
Odour	Odourless.
Decomposition Temperature	340 °C (sulfuric acid)
Melting Point	-8.6 °C (15%); -14 °C (20%); -46 °C (33%); -33 °C (51%).
Boiling Point	102.6 °C (15%); 104 °C (20%); 109 °C (33%); 125 °C (51%).
Solubility in Water	Soluble in water in all proportions. CAUTION: Always add the acid to water. Heat evolution due to mixing may cause explosive spattering.
Solubility in Organic Solvents	Insoluble in methanol, diethyl ether, n-octanol.
Specific Gravity	1.1 (15%); 1.142 (20%); 1.18 (25%); 1.25 (33.33%); 1.30 (40%); 1.40 (50%); 1.41 (51%).
pH	<0.3 [Acidic]. pH of 1.0 N solution (~5.0%): 0.3; pH of 0.1 N solution (~0.5%): 1.2; pH of 0.01 N solution (~0.05%): 2.1.
Vapour Pressure	The highest known values are 2.3 kPa (17.535 mmHg) (@ 20 °C) (Water) and 0.1 kPa (1 mmHg) (@ 20 °C) (sulfuric acid). Weighted average: 14.03 mmHg (@ 20 °C) (20%).
Vapour Density (Air=1)	The highest known value is 3.4 (Air = 1) (Sulfuric acid). Weighted average: 1.18 (Air = 1) (20%); 2.01 (Air = 1) (50%).
Odour Threshold	>1 ppm (Sulfuric Acid).
Viscosity	21 mPas @ 25 °C (Sulfuric Acid).
Flammability	Non combustible material.
Explosion Properties	Contact with most metals causes formation of flammable and explosive hydrogen gas. However, the risk is reduced due to the weaker concentration of Sulfuric Acid present. Exothermic reaction with water. Containers may explode when heated or if contaminated with water. Slightly explosive in presence of oxidizing materials. Mixtures of sulfuric acid and any of the following can explode: p-nitrotoluene, pentasilver trihydroxydiaminophosphate, perchlorates, alcohols with strong hydrogen peroxide, ammonium tetraperoxychromate, mercuric nitrite, potassium chlorate, potassium permanganate with potassium chloride. Nitramide decomposes explosively on contact with concentrated sulfuric acid. 1,3,5-Trinitrosahexahydro-1,3,5-triazine + sulfuric acid causes explosive decomposition.
Molecular Weight	98.08 (Sulfuric acid)

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10. Stability and reactivity

Chemical Stability	Stable under normal temperatures pressures and conditions of storage and handling. Concentrated solutions 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, oxidizers, amines, bases and incompatible materials.
Incompatible Materials	Water, combustible materials, oxidizing agents, reducing agents, metals as powders, metals as non powders (yields hydrogen gas), metal alloys, metal compounds, acids, alkalis, organic materials, organic solvents, alkali metals, alkaline earth metals, alkaline earth compounds, alkali hydroxides solutions, chlorates, perchlorates, permanganates, carbides, cyanides, nitrides, sulfides, fulminates, picrates, nitrates, nitrides, halogens, halogen-halogen compounds, salts of oxyhalogenic 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-butylaldehyde, diisobutylene, epichlorohydrin, ethylene cyanohydrin, ethylene diamine, ethylene glycol, ethylenimine, isoprene, lithium silicide, pentasilver trihydroxydiaminophosphate, phosphorus, phosphorus isocyanate, beta-propiolactone, and pyridine.
Hazardous Decomposition Products	Irritating and highly toxic fumes and gases, including oxides of sulfur. Reaction with water or steam may generate much heat which will increase the concentration of 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	Concentrated solutions react violently with water, spattering and liberating heat. Corrosively attacks most metals liberating hydrogen gas, (potential explosion). Sulfuric acid reacts vigorously, violently or explosively with many organic and inorganic chemicals. Reacts with carbonates to generate carbon dioxide gas. Reacts with cyanides to form toxic hydrogen cyanide. Reacts with sulfides to form toxic hydrogen sulfide.
Hazardous Polymerization	Will not occur.

11. Toxicological Information

Ingestion	Corrosive. Harmful if swallowed. Ingestion of liquid or spray mist may produce severe burns to the mouth, throat and stomach, resulting in sore throat, immediate severe burning pain in the mouth, throat, abdomen, general feeling of sickness, vomiting, diarrhoea, and the risk of perforation of oesophagus and stomach, leading to death. Ingestion can cause severe swelling of the larynx and skeletal paralysis affecting the ability to breathe, circulatory shock and convulsions. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion. Circulatory shock is often the immediate cause of death. Ingestion can possibly cause pyloric stenosis after a latency period of some weeks.
Inhalation	Harmful if inhaled. Inhalation of the vapours/aerosols, spray mist or fumes may produce severe irritation and chemical burns to the nose, throat and respiratory tract, with burning sensation, sore throat, coughing, wheezing, choking, laboured breathing or shortness of breath, headache, nausea, and vomiting. Inhalation may result in dental erosion, laryngitis, bronchitis, spasm, inflammation and oedema of the larynx and bronchi, chemical pneumonitis, and delayed pulmonary oedema. Severe over-exposure can result in death.
Skin	Corrosive. Skin contact may produce severe skin burns. Symptoms of redness, irritation, pain, scaling, or, occasionally, blistering can occur. May be harmful if absorbed through the skin. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact. Circulatory shock is often the immediate cause of death.
Eye	Corrosive. Liquid or spray mist may produce severe tissue burns. Eye contact can cause watering, blurred vision, redness, irritation and pain. It can cause permanent eye/corneal damage and blindness.
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	Repeated or prolonged contact with liquid, vapour or spray mist may produce harmful corrosive effects to skin and respiratory system, chronic eye irritation and severe skin irritation. Prolonged or repeated inhalation may cause nosebleeds, nasal congestion, erosion of the teeth, perforation of the nasal septum, chest pain and respiratory tract irritation leading to frequent attacks of bronchial infection. Prolonged or repeated eye contact may cause conjunctivitis. Long-term exposure to mist or vapours may cause damage to teeth. May cause adverse reproductive effects. Chronic exposure to mists containing sulfuric acid is a cancer hazard.
Respiratory Irritation	Human volunteers exposed to sulfuric acid for 5-15 minutes noticed no odour, or irritation below 1

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mg/m³. All volunteers noticed the exposure at 3 mg/m³ and at 5 mg/m³ 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 (39 mg/m³ dry mist and 21 mg/m³ wet mist sulfuric acid) for 1/2-1 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.

12. Ecological information

Ecotoxicity	Damage of aquatic organisms. Harmful effect due to pH shift. Toxic effect for fishes and algal. Caustic even in diluted form. Does not cause biological oxygen deficit. Endangers drinking-water supplies if allowed to enter soil and/or waters in large quantities. Neutralization 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!

13. Disposal considerations

Disposal Considerations	Whatever cannot be saved for recovery or recycling should be disposed of according to relevant local, state and federal government regulations.
Waste Disposal	Neutralise remaining product with lime, soda ash or sodium bicarbonate, adjusting pH to 6-8. Flush to sewer as 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.
U.N. Number	2796
UN proper shipping name	SULFURIC ACID
Transport hazard class(es)	8
Hazchem Code	2R
Packaging Method	3.8.8
Packing Group	II
EPG Number	8A1
IERG Number	37

15. Regulatory information

Regulatory Information	Listed in the Australian Inventory of Chemical Substances (AICS). Not listed under WHS Regulation 2011, Schedule 10 - Prohibited carcinogens, restricted carcinogens and restricted hazardous chemicals.
Poisons Schedule	S6

16. Other Information

Literature References	'Standard for the Uniform Scheduling of Medicines and Poisons .', Commonwealth of Australia. Lewis, Richard J. Sr. 'Hawley's Condensed Chemical Dictionary 13th. Ed.', Rev., John Wiley and Sons, Inc., NY, 1997. National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.', 2007. Safe Work Australia, 'National Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals', 2011. Standards Australia, 'SAA/SNZ HB 76:2010 Dangerous Goods - Initial Emergency Response Guide', Standards Australia/Standards New Zealand, 2010. Safe Work Australia, 'Approved Criteria for Classifying Hazardous Substances [NOHSC:1008 (2004)]'. Safe Work Australia, 'Hazardous Substances Information System, 2005'. Safe Work Australia, 'National Code of Practice for the Labelling of Safe Work Hazardous Substances
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**Contact
Person/Point**

(2011).
Safe Work Australia, 'National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995) 3rd Edition]'.
Paul McCarthy Ph. (08) 8440 2000 **DISCLAIMER STATEMENT:**
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**Empirical Formula &
Structural Formula**

H₂SO₄
...End Of MSDS...

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