This Material Safety Data Sheet is for study purposes only and is not to be used in the workplace

Instructions:
1. You may print this document for reference by selecting the PRINT button from the toolbar above or
2. Keep this window open in the background, for reference, while you complete the task.
3. Click the desired link below to take you to the beginning of the selected chemical

INDEX

FORMALDEHYDE SOLUTIONS

NAPHTHALENE

NITRIC ACID

HYDROGEN PEROXIDE
MATERIAL SAFETY DATA SHEET

Hazardous according to criteria of WorkSafe Australia

1. IDENTIFICATION

General

Product Name : FORMALDEHYDE SOLUTIONS with not less than 25%
Other Names : formaldehyde
UN No. : 2209
Dangerous Goods Class: 8
Subsidiary Risk : None Allocated
Hazchem Code : 2T
Pack Group : III
EPG : 8A1
Poisons Schedule : 6

Uses :

Urea and melamine resins, polyacetal resins, phenolic resins, ethylene glycol, pentaerythritol, hexamethylenetetramine, fertiliser, disinfectant, biocide, embalming fluids, preservative, reducing agent as in recovery of gold and silver corrosion corrosive inhibitor in oil wells, durable-press treatment of textile fabrics, industrial sterilant, treatment of grain smut, foam insulation.

1.1 PHYSICAL DESCRIPTION / PROPERTIES

Appearance : Clear, colourless liquid, with pungent, irritating odour.
Formula : HCHO
Boiling Point : 101 deg C
Melting Point : N/A deg C
Vapour Pressure : N/A
Specific Gravity : 1.10 (water = 1)
Flash Point : Closed Cup 64

pH : 2.8 (neat)

Solubility in water : comp g/l (25 deg C)

Flammability Limits (as percentage volume in air)

Lower Explosion Limit : 7

Upper Explosion Limit : 73

1.2 OTHER PROPERTIES

Miscible in water and alcohol.

1.3 INGREDIENTS

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<thead>
<tr>
<th>Chemical Entity</th>
<th>CAS No</th>
<th>Proportions (%)</th>
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<td>35 - 38</td>
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<tr>
<td>WATER</td>
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<tr>
<td>METHANOL</td>
<td>[ 67-56-1]</td>
<td>6 - 8</td>
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</table>

2. HEALTH HAZARD INFORMATION

2.1 HEALTH EFFECTS - ACUTE

Swallowed   Swallowing can result in nausea, vomiting, diarrhoea, abdominal pain, convulsions, chemical burns, loss of consciousness and possible death.

Eye         Corrosive to the eyes; contact can cause corneal burns. Contamination of the eyes can result in permanent injury.

Skin        Corrosive to the skin - may cause skin burns. Repeated or prolonged skin contact may lead to allergic contact dermatitis. A skin sensitiser. A component of this material, methanol, can be absorbed through the skin, however symptoms of poisoning via this route are unlikely because of slow absorption.

Inhaled     Vapour is irritant to mucous membranes and respiratory tract. Inhalation of vapour can result in headaches, dizziness and possible nausea.
2.2 Health Effects - Chronic

Some long term animal test data suggests a carcinogenic potential for the formaldehyde contained in the solution. This was found to occur at levels which caused chronic tissue irritation, and was well above the exposure standard. These particular data are not considered relevant to normal use because these high concentrations would not be voluntarily tolerated by humans, but do emphasise the need for care in handling. Chronic exposure to methanol from skin contact, inhalation and/or swallowing, at concentrations greater than 1000 ppm can result in permanent blindness and central nervous system effects.

2.3 First Aid

Swallowed: Immediately rinse mouth with water. DO NOT induce vomiting. Give water or milk to drink followed by a raw egg, if available. Seek immediate medical assistance.

Eye: Immediately irrigate with copious quantities of water for at least 15 minutes. Eyelids to be held open. Remove clothing if contaminated and wash skin. Urgently seek medical assistance. Transport to local hospital or medical centre.

Skin: Immediately wash contaminated skin with plenty of water. Remove contaminated clothing and wash before reuse. Can be absorbed through the skin with resultant toxic effects. For skin burns, immediately flood burnt area with plenty of water and cover with a clean, dry dressing. Seek immediate medical advice.

Inhaled: Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If breathing is laboured and patient cyanotic (blue), ensure airways are clear and have qualified person give oxygen through a face mask. If breathing has stopped apply artificial respiration at once. In event of cardiac arrest, apply external cardiac massage. For all but the most minor symptoms arrange for patient to be seen by a doctor as soon as possible, either on site or at the nearest hospital. Poison Information Centres in each State capital city can provide additional assistance for scheduled poisons.

2.4 First Aid Facilities

Ensure an eye bath and safety shower are available and ready for use.

2.5 Advice to Doctor
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Treat symptomatically. Can cause corneal burns. If exposure has been severe and/or symptoms marked, observation in hospital for 48 hours should be considered, due the possibility of delayed pulmonary oedema.

2.6 TOXICITY DATA

Reported fatal dose for humans: 60 - 90 mls. For formaldehyde; Oral LD50 (rat): 80 mg/kg Inhalation LC50 (rat): 590 mg/m3 Low concentrations of formaldehyde may cause sensitisation by skin contact. Formaldehyde vapour is irritant to mucous membranes and respiratory tract. Asthma-like symptoms have occasionally been reported following inhalation. Animal studies have shown formaldehyde to cause carcinogenic effects. In particular, chronic inhalation studies in rats have shown the development of nasal cavity carcinomas at 6 and 15 ppm. These cancers developed at concentrations which produced chronic tissue irritation and would not be voluntarily tolerated by humans. For methanol; Oral LD50 (rat): 5628 mg/kg Inhalation LC50 (rat): 64000 ppm/4 hr Evidence indicates that repeated or prolonged exposure to methanol could result in visual impairment and central nervous system effects.

3. PRECAUTIONS FOR USE

3.1 EXPOSURE STANDARDS

No value assigned for this specific material by the National Occupational Health and Safety Commission (WorkSafe Australia). However, Exposure Standard for constituents: TWA STEL CARCINOGEN NOTICES ppm mg/m3 ppm mg/m3 CATEGORY Formaldehyde 1 1.2 2 2.5 2 Sen Methanol 200 262 250 328 - Sk Carcinogen Category 2 - possible human carcinogen. 'Sk' notice - absorption through skin may be significant source of exposure. The exposure standard is invalidated if such contact should occur. 'Sen' notice - sensitiser. The substance can cause a specific immune response in some people. An affected individual may subsequently react to exposure to minute levels of that substance. Odour Threshold for formaldehyde: 0.1-0.5 ppm Odour Threshold for methanol: 2000 ppm

3.2 ENGINEERING CONTROLS

Ensure ventilation is adequate and that air concentrations of components are controlled below quoted exposure standards. Use with local exhaust ventilation or while wearing organic vapour respirator or air supplied mask. Keep containers closed when not in use.

3.3 PERSONAL PROTECTION
Avoid skin and eye contact and inhalation of vapour. Wear overalls, full face shield, elbow-length gloves, splash apron and rubber boots. Use with adequate ventilation. If inhalation risk exists wear air supplied mask meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

3.4 Flammability

Combustible liquid. Vapour may form explosive mixtures with air.

4 Safe Handling Information

4.1 Storage / Transport

Classified as a C1 (COMBUSTIBLE LIQUID) for the purpose of storage and handling, in accordance with the requirements of AS1940. Refer to State Regulations for storage and transport requirements. Classified as an 8 (CORROSIVE) Dangerous Substance for the purpose of transport. Refer to relevant regulations for storage and transport requirements. Not to be loaded with explosives (Class 1), dangerous when wet substances (Class 4.3), oxidising agents (Class 5.1), organic peroxides (Class 5.2), cyanides of Class 6, radioactive substances (Class 7), strong alkalis or strong acids of Class 8, foodstuff or foodstuff empties, however exemptions may apply. This material is a Scheduled Poison (S6) and must be stored, maintained and used in accordance with the relevant regulations. Store in well ventilated area. Store away from oxidising agents, strong acids, alkalis and foodstuffs. Keep containers tightly closed at all times - check regularly for leaks.

4.2 Packaging / Labelling

UN No. 2209
Class 8
Sub Risk None Allocated
Hazchem Code 2T
Pack Group III
EPG No. 8A1
Shipping Name FORMALDEHYDE SOLUTIONS with not less than 25%
Hazard TOXIC CORROSIVE

Risk Phrases
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R23/24/25 Toxic by inhalation, in contact with skin and if swallowed.

R34 Causes burns.

R41 Risk of serious damage to eyes.

R43 May cause sensitisation by skin contact.

R40: FORMAL Possible risk of irreversible effects. Carcinogenic effects Category 2 - probable human carcinogen.

Safety Phrases

S24/25 Avoid contact with skin and eyes.

S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S38 In case of insufficient ventilation, wear suitable respiratory equipment.

S44 If you feel unwell, contact a doctor or Poisons Information Centre immediately (show the label where possible).

S26 In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons Information Centre.

4.3 SPILLS AND DISPOSAL

Spills

Shut off all possible sources of ignition. Work up wind. Increase ventilation. Clear area of all unprotected personnel. Wear protective equipment to prevent skin and eye contamination and inhalation of vapours. Contain using sand or soil - prevent run off into drains and waterways. Use absorbent (soil, sand, vermiculite or other inert material).

Collect and seal in properly labelled drums for disposal. Neutralise the area with a strong solution (up to 25% by weight) of sodium metabisulphite or 5% ammonia solution. Again, use absorbent, then collect and seal in properly labelled drums for disposal. Wash area down with excess water.

Disposal

Refer to State Land Waste Management Authority. Decontamination and destruction of containers should be considered.

4.4 FIRE AND EXPLOSION HAZARD

Fire / Explosion
Combustible liquid. Heating can cause expansion or decomposition leading to violent rupture of containers. If safe to do so, remove containers from path of fire. Keep containers cool with water spray. Fire fighters to wear self-contained breathing apparatus if risk of exposure to vapour or products of combustion.

**Extinguishing Media**

Water fog (or if unavailable fine water spray), foam, dry agent (carbon dioxide, dry chemical powder).

### 5 OTHER INFORMATION

**Other Information**

Formaldehyde has a relatively low toxicity for fish, 96 h LC50 values being higher than 10 mg/litre in all cases, eg. Rainbow trout (fingerling) 96 h LC50 : 123 mg/L Algae and some invertebrates seem to be more susceptible to formaldehyde, however responses differ widely. Bacteria (E.coli) : toxic: 1 mg/L Algae (Scenedesmus) : toxic: 0.3-0.5 mg/L Inhibits anaerobic sludge digestion : at 100 mg/L aerobic degradation : 135-175 mg/L
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MATERIAL SAFETY DATA SHEET

Hazardous according to criteria of WorkSafe Australia

1. IDENTIFICATION

General

Product Name : NAPHTHALENE

Other Names : NAPHTHALENE WHITE TAR; TAR CAMPHOR; SUBLIMED NAPHTHALENE

UN No. : 1334

Dangerous Goods Class : 4.1

Subsidiary Risk : None Allocated

Hazchem Code : 2Z

Pack Group : III

EPG : 4H1

Poisons Schedule : 6

Uses :

Intermediate (phthalic anhydride, naphthol, chlorinated naphthalenes and naphthol derivatives, dyes); moth repellent, fungicide, smokeless powder, cutting fluid, lubricant, synthetic resins, synthetic tanning, textile chemicals, preservative, emulsion breakers, scintillation counters, antiseptic.

1.1 PHYSICAL DESCRIPTION / PROPERTIES

Appearance : White volatile crystalline flakes with an aromatic odour.

Formula : C10H8

Boiling Point : 218 deg C

Melting Point : 78 deg C

Vapour Pressure : 0.082 mm Hg (1 atmosphere)

Specific Gravity : 1.033 (water = 1)
Flash Point : Closed Cup 78.9
pH : ()
Solubility in water : Insol g/l (25 deg C)

Flammability Limits (as percentage volume in air)
Lower Explosion Limit : 0.9
Upper Explosion Limit : 5.9

1.2 OTHER PROPERTIES

Soluble in benzene, absolute alcohol and ether

1.3 INGREDIENTS

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<thead>
<tr>
<th>Chemical Entity</th>
<th>CAS No</th>
<th>Proportions (%)</th>
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<td>NAPHTHALENE</td>
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2. HEALTH HAZARD INFORMATION

2.1 HEALTH EFFECTS - ACUTE

Swallowed May cause liver and kidney damage. May cause methemoglobinemia, cyanosis, convulsions and death. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhoea. Exposure may cause anaemia and other blood abnormalities.

Eye Causes eye irritation. Vapours can cause eye irritation.

Skin May cause skin irritation. May be absorbed through the skin in harmful amounts. May cause skin sensitisation, an allergic reaction, which becomes evident upon re-exposure to this material.

Inhaled May cause respiratory tract irritation. May cause effects similar to those described for ingestion.
2.2 **HEALTH EFFECTS - CHRONIC**

May cause anaemia and other blood cell abnormalities. Inhalation, ingestion, or skin absorption may cause eye toxicity, including corneal injury, optical neuritis, blurring vision, and possible cataract formation. May cause liver and kidney damage. Target organs: blood, kidneys, liver, eyes.

2.3 **FIRST AID**

**Swallowed**
If victim is conscious and alert, give 2 - 4 cupfuls of milk or water. Seek medical aid immediately.

**Eye**
Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower lids. Seek medical attention.

**Skin**
Flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical attention if irritation develops or persists.

**Inhaled**
Remove from exposure to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention if cough or other symptoms appear.

2.4 **FIRST AID FACILITIES**

Ensure an eye bath and safety shower are available and ready for use.

2.5 **ADVICE TO DOCTOR**

No specific antidote exists. Treat symptomatically based on judgement of doctor and individual reactions of patient.

2.6 **TOXICITY DATA**

**Oral LD50** = 490 mg/kg (Rat) ; 533 mg/kg (Mouse)

**Dermal LD50** = >20,000 mg/kg (Rabbit) ; >2500 mg/kg (Rat)

**Inhalation LC50** = not available
3. PRECAUTIONS FOR USE

3.1 EXPOSURE STANDARDS

The following exposure standards are recommended by WorkSafe Australia:
Naphthalene : TWA = 10 ppm (52 mg/m3) STEL = 15 ppm (79 mg/m3)

3.2 ENGINEERING CONTROLS

Use explosion-proof ventilation equipment. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

3.3 PERSONAL PROTECTION

Wear appropriate protective eyeglasses or chemical safety goggles. Wear impervious gloves, and other appropriate protective clothing to prevent skin exposure. Wear an approved respirator when necessary.

3.4 FLAMMABILITY

Material is a flammable solid. Keep away from sources of heat, ignition and sparks. Use flameproof fittings.

4 SAFE HANDLING INFORMATION

4.1 STORAGE / TRANSPORT

Use with adequate ventilation. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Empty containers retain product residue (liquid and/or vapour) and can be dangerous. Do not pressurise, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks or open flames. Keep away from sources of ignition. Store in a cool, dry well-ventilated area away from incompatible substances.

4.2 PACKAGING / LABELLING

UN No. 1334
Class 4.1
Sub Risk None Allocated
Hazchem Code 2Z
Pack Group III
EPG No. 4H1
Shipping Name NAPHTHALENE
Hazard HARMFUL

**Risk Phrases**

R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.

**Safety Phrases**

S24/25 Avoid contact with skin and eyes.

**4.3 SPILLS AND DISPOSAL**

**Spills**

Clean-up personnel should wear full protective clothing including breathing apparatus. Avoid raising dust. Extinguish all ignition sources - NO SMOKING.

**Disposal**

Dispose of in accordance with all Local, State and Federal regulations at an approved waste disposal facility.

**4.4 FIRE AND EXPLOSION HAZARD**

**Fire / Explosion**

May burn if heated. Molten material burns fiercely on ignition. Explosive boiling can occur on contact of boiling molten material with water. Vapours may recrystallise spreading the fire hazard. Stable at room temperature in closed containers under normal storage and handling conditions. Incompatible with aluminium trichloride and benzoyl chloride, chromic anhydride and oxidising agents. Hazardous decomposition products include carbon monoxide and carbon dioxide. Hazardous polymerisation has not been reported. Dusts at sufficient concentrations can form explosive mixtures with air.

**Extinguishing Media**

Fire-fighters should wear full protective clothing including self-contained breathing apparatus. Use water spray, dry chemical or carbon dioxide type extinguishers. Use water spray to keep fire-exposed containers cool. Use equipment/media appropriate to surrounding fire conditions.
5 OTHER INFORMATION

Other Information

In air, substance rapidly degrades by reaction with photochemically-produced hydroxyl radicals. In water, substance undergoes volatilisation, photolysis, adsorption, and biodegradation. On soil, substance is slightly adsorbed and also biodegraded.
Ecotoxicity : LC50 = 150 mg/L/96hr (Mosquito Fish) LC100 = 4-5 mg/L/1hr (Sunfish)
1. IDENTIFICATION

General

Product Name : NITRIC ACID, other than red fuming

Other Names : AQUA FORTIS ; ENGRAVER’S ACID ; AZOTIC ACID

UN No. : 2031

Dangerous Goods Class : 8

Subsidiary Risk : 5.1

Hazchem Code : 2PE

Pack Group : II

EPG : 8D1

Poisons Schedule : 6

Uses :

Manufacture of ammonium nitrate for fertiliser and explosives, organic synthesis (dyes, drugs, explosives, cellulose nitrate, nitrate salts), metallurgy, photengraving, etching steel, ore flotation, urethanes, rubber chemicals, reprocessing spent nuclear fuel.

1.1 PHYSICAL DESCRIPTION / PROPERTIES

Appearance : Transparent colourless, or yellowish fuming, suffocating,†hygroscopic, corrosive liquid.

Formula : HNO3

Boiling Point : 120.1 deg C

Melting Point : -35.9 deg C

Vapour Pressure : 21-22 mm Hg (1 atmosphere)

Specific Gravity : 1.405 (water = 1)

Flash Point : N/A
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pH : ()

Solubility in water : Sol. g/l (25 deg C)

Flammability Limits (as percentage volume in air)

Lower Explosion Limit : N/A

Upper Explosion Limit : N/A

1.2 OTHER PROPERTIES

Refractive index at 24 deg C = 1.3970 Vapour density (air = 1) = 1.4

1.3 INGREDIENTS

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<td>WATER</td>
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2. HEALTH HAZARD INFORMATION

2.1 HEALTH EFFECTS - ACUTE

Swallowed  Extremely corrosive to the mouth and throat. Swallowing the liquid burns the tissues, causing severe abdominal pain, nausea, vomiting, kidney damage and collapse. Swallowing large quantities can cause death.

Eye  Extremely corrosive to eyes. Brief contact with vapours will be severely irritating. Brief contact with liquid or mists can severely damage the eyes, prolonged contact may cause permanent eye injury - blindness may follow.

Skin  Extremely corrosive to skin. Vapours will severely irritate, liquid and mists will severely burn skin. Prolonged contact will burn or destroy surrounding tissue. Extensive burns on the body may cause death. Deep ulcers and a yellow to brown staining of the skin will occur.

Inhaled  Vapours and mists are extremely corrosive to the nose, throat and mucous membranes. Bronchitis, pulmonary oedema and chemical pneumonitis may occur. Irritation, coughing, chest pain and difficulty in breathing may occur with brief exposure. Breathing high concentrations may result in death after several minutes of exposure.
2.2 HEALTH EFFECTS - CHRONIC

May cause erosion of the teeth, lesions on the skin, bronchial irritation, coughing and pneumonia. This material is not considered to be a carcinogen. Persons with pre-existing skin disorders or eye diseases may be more susceptible.

2.3 FIRST AID

Swallowed
DO NOT induce vomiting. If conscious, give 1 - 3 cups of water, milk, milk of magnesia or egg whites to drink. Seek immediate medical attention. Do not give anything by mouth to an unconscious person.

Eye
Immediately flush eyes with lots of running water for at least 15 minutes, lifting the upper and lower eyelids occasionally. Seek medical attention.

Skin
Remove contaminated clothing and shoes, wash thoroughly with running water for at least 15 minutes. Seek immediate medical attention.

Inhaled
Remove victim to fresh air. Give artificial respiration if not breathing. Seek immediate medical attention.

2.4 FIRST AID FACILITIES

Ensure an eye bath and safety shower are available and ready for use.

2.5 ADVICE TO DOCTOR

Treat symptomatically based on judgement of doctor and reactions of patient.

2.6 TOXICITY DATA

Oral LD50 = 430 mg/kg (Human)
Dermal LD50 = not available
Inhalation LC50 = 49 ppm/4hr (Rat)

3. PRECAUTIONS FOR USE
3.1 Exposure Standards

Nitric Acid TWA = 2 ppm (5.2 mg/m3) (WorkSafe Australia) STEL = 4 ppm (10 mg/m3) (WorkSafe Australia)

3.2 Engineering Controls

Use local exhaust ventilation to maintain exposure levels below standards.

3.3 Personal Protection

If use conditions generate vapours or mists, wear a NIOSH-approved respirator appropriate for those emission levels. Chemical goggles and a full face-shield or full face-piece respirator. Acid-resistant slicker suit, rubber apron, rubber boots with pants outside, rubber gloves with gauntlets. NOTE: nitric acid is an oxidiser and should not come into contact with oxidisable materials. Some cartridges and canisters may contain oxidisable materials such as activated carbon and therefore should not be used to provide protection against nitric acid. Only non-oxidisable sorbents should be used.

3.4 Flammability

Material is not flammable.

SAFE HANDLING INFORMATION

4.1 Storage / Transport

Store or transport in a cool, dry area away from direct heat and sunlight. Avoid contact with reducing agents, alkalis, carbides, turpentine, hydrogen sulphide, rubber, polyethylene, combustible materials (wood, cloth, organic materials), metals (iron, copper & alloys), oxidisable materials, active metals.
4.2 PACKAGING / LABELLING

UN No. 2031  
Class 8  
Sun Risk 5.1  
Hazchem Code 2PE  
Pack Group II  
EPG No. 8D1  
Shipping Name NITRIC ACID, other than red fuming  
Hazard VERY CORROSIVE

Risk Phrases

R8 Contact with combustible material may cause fire.  
R35 Causes severe burns.  
R41 Risk of serious damage to eyes.

Safety Phrases

S23: NIACID Do not breathe fumes/vapour.  
S26 In case of contact with eyes, rinse immediately with plenty of water and contact a doctor or Poisons Information Centre.  
S36 Wear suitable protective clothing.

4.3 SPILLS AND DISPOSAL

Spills

Evacuate area of all unnecessary personnel.  
Steps to be taken in the event of a spill or discharge: wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Neutralize spill with soda ash or lime. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water. Keep combustibles (wood, paper, oil, etc.) Away from spilled material.

Disposal

Dispose of in accordance with all Local, State and Federal regulations at an approved waste disposal facility.
4.4 FIRE AND EXPLOSION HAZARD

Fire / Explosion

Extinguish all nearby sources of ignition since flammable hydrogen gas may be liberated from contact with some metals. Nitric acid is a strong oxidiser and its heat of reaction with reducing agents or combustibles may cause ignition. Reacts explosively with combustible organics or readily oxidisable materials such as alcohols, turpentines, metal powder, hydrogen sulphide etc. Thermal decomposition liberates toxic, corrosive fumes of nitrogen oxide and hydrogen nitrate. Reacts with water or steam to produce heat, and toxic, corrosive fumes of nitrogen oxides. Reaction with metals produces flammable hydrogen gas.

Extinguishing Media

Use water spray, or flood with water to extinguish fire. Use media/equipment appropriate to surrounding fire conditions. Use water spray to cool nearby containers and structures exposed to fire. Fire-fighters should wear full protective clothing including self-contained breathing apparatus.

5 OTHER INFORMATION

Other Information

No data available
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MATERIAL SAFETY DATA SHEET

Hazardous according to criteria of WorkSafe Australia

1. IDENTIFICATION

General

Product Name : HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS, 20 - 60 % H2O2

Other Names : HYDROGEN PEROXIDE; HYDROGEN DIOXIDE; HYDROPEROXIDE ALBONE; INHIBINE; PERHYDROL; PEROXAN

UN No. : 2014

Dangerous Goods Class: 5.1

Subsidiary Risk : 8

Hazchem Code : 2P

Pack Group : II

EPG : 5E1

Poisons Schedule : 5

Uses :

The principal use is as an oxidant in bleaching paper pulp, cotton/synthetic blends, and wool fabrics. Used in wastewater and sewage treatment plants to reduce sulphide corrosion and odours and to supply supplemental dissolved oxygen

1.1 PHYSICAL DESCRIPTION / PROPERTIES

Appearance : Clear colourless liquid with a slightly pungent and irritating odour.‡

Formula : H2O2

Boiling Point : below deg C

Melting Point : below deg C

Vapour Pressure : below mm Hg (1 atmosphere)
Specific Gravity : below (water = 1)

Flash Point : N/A

pH : ()

Solubility in water : Sol g/l (25 deg C)

Flammability Limits (as percentage volume in air)

Lower Explosion Limit : N/A

Upper Explosion Limit : N/A

1.2 OTHER PROPERTIES

Nominal Concentration % w/w 20% 35% 50% 59.5% Boiling point deg C 104 108 114 119 Melting point deg C -14 -33 -52 -56 Vapour pressure mmHg @ 30 deg C 29 23 18 14 Specific gravity 1.07 1.133 1.196 1.24 Miscibility with water is 100% for all concentrations.

1.3 INGREDIENTS

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<th>CAS No</th>
<th>Proportions</th>
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<td>WATER</td>
<td>[ 7732-18-5]</td>
<td>40 - 80</td>
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2. HEALTH HAZARD INFORMATION

2.1 HEALTH EFFECTS - ACUTE

Swallowed May produce a sudden evolution of oxygen which can cause injury by distending the oesophagus or stomach; local action may cause internal bleeding.

Eye Causes eye burns; effects may be delayed. Wear coverall chemical splash goggles. In addition where the possibility exists for eye or face contact due to splashing or spraying of material, wear chemical splash goggles/full-length face shield combination.

Skin Causes skin irritation or severe burns.

Inhaled Causes severe irritation of nose, throat and lungs.
2.2 Health Effects - Chronic

Human health effects of over-exposure by skin contact with aqueous solutions of less than 50% may include irritation with discomfort or rash. Prolonged exposure to these lower concentrations or contact with aqueous concentrations of greater than 50% may result in skin burns or ulcerations. The compound has been infrequently associated with sensitisation in humans. Irritation of the eye with discomfort, tearing or blurring of vision may occur following contact with aqueous solutions of 10% or less, although aqueous concentrations of greater than 10% may result in eye corrosion with corneal or conjunctival ulceration with possible loss of vision. Over-exposure by inhalation may cause irritation of the upper respiratory passages or non-specific discomfort such as nausea, headache, or weakness. Higher inhalation exposure may lead to temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath. Ingestion may cause irritation of the gastrointestinal tract with abdominal pain or red blood cell destruction. When used as colonic lavage, hydrogen peroxide has caused gas embolism and gangrene of the intestine at

2.3 First Aid

Swallowed  Give water to drink. DO NOT induce vomiting. Check mouth of unconscious patient, remove any product. Seek medical attention.

Eye  Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open. Seek medical attention.

Skin  Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Seek medical advice. Wash contaminated clothing and shoes promptly and thoroughly.

Inhaled  Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention.

2.4 First Aid Facilities

Ensure an eye bath and safety shower are available and ready for use.

2.5 Advice to Doctor

If swallowed, large amounts of oxygen may be released quickly. The distension of the stomach or oesophagus may be injurious. Insertion of a gastric tube may be advisable.

2.6 Toxicity Data

Oral LD50 = 75 mg/kg in rats (70% H2O2)
Inhalation 8-hour LC50 = >2000 ppm in rats (90% H2O2)

Skin absorption LD50 = 700 mg/kg (90% H2O2)

### 3. PRECAUTIONS FOR USE

#### 3.1 EXPOSURE STANDARDS

WorkSafe TWA : 1 ppm, 1.4 mg/m3 WorkSafe STEL : none established TLV (ACGIH) : 1 ppm, 1.4 mg/m3 - 8hr TWA PEL (OSHA) : 1 ppm, 1.4 mg/m3 (90%) - 8hr TWA

#### 3.2 ENGINEERING CONTROLS

Good general ventilation should be provided to keep peroxide concentrations below exposure limits. Use extreme care when attempting any reactions because of fire and explosion potential (immediate or delayed). Conduct all initial experiments on a small scale and protect personnel with adequate shielding as the reactions are unpredictable, being affected by impurities, contaminants etc. Avoid contamination from any source including metals, dust and organic materials. Never use pressure to empty drums as they are not pressure vessels.

#### 3.3 PERSONAL PROTECTION

Personnel should wear the following personal protective equipment. Synthetic rubber (neoprene, butyl rubber or vinyl) gloves conforming to AS2161. Wear coverall chemical splash goggles. In addition where the possibility exists for eye or face contact due to splashing or spraying of material, wear chemical splash goggles/full length face shield combination. Wear clean synthetic fibre clothing. Avoid flammable clothing such as cotton, rayon or wool. Use full rain suit or 'acid' suit of neoprene, PVC, butyl rubber or polyethylene when appropriate to avoid exposure to hydrogen peroxide clothing should conform to AS2919. Hard hat with brim : protects the head and reduces rundown of splashed hydrogen peroxide into the eyes. Boots : synthetic rubber (neoprene, butyl rubber or vinyl). Do not wear leather shoes or boots as they can catch fire within minutes after contact with hydrogen peroxide, causing severe burns to the wearer. Footwear to conform to AS2210. In an emergency or in performing work where there is a possibility of direct or repeated contact with vapour a self-contained breathing apparatus should be worn conforming to AS1716/AS1715.

#### 3.4 FLAMMABILITY

Will not burn, but decomposition will release oxygen which will increase the explosive limits and burning rate of flammable vapours.
4 SAFE HANDLING INFORMATION

4.1 STORAGE / TRANSPORT

Dangerous Goods Class - 5.1 must be stored and transported in accordance with State or Territory dangerous goods regulations. Store in a properly vented container or in approved bulk storage facilities. Do not block vent. Store drums on flame retardant pallets. Do not store where contact with incompatible materials could occur, even with a spill. Store drums away from flammables, organics and combustibles. Have water available for diluting spills. Keep container out of sun and away from heat, sparks, and flame. Do not add any other product to container. Never return unused peroxide to container, instead dilute with plenty of water and discard. Rinse empty containers thoroughly with clean water before discarding. Do not store or consume food, drink or tobacco in areas where they may become contaminated with this material. Any metal storage tank, container, piping or equipment must be passivated prior to handling hydrogen peroxide. Follow all instructions as decreed by legislation.

4.2 PACKAGING / LABELLING

UN No. 2014

Class 5.1

Sun Risk 8

Hazchem Code 2P

Pack Group II

EPG No. 5E1

Shipping Name HYDROGEN PEROXIDE, AQUEOUS SOLUTIONS, 20 - 60 % H2O2

Hazard VERY CORROSIVE

Risk Phrases

R35 Causes severe burns.

R41 Risk of serious damage to eyes.

R8 Contact with combustible material may cause fire.

Safety Phrases

S3 Keep in a cool place.
S28: HYPERT After contact with skin, wash immediately with plenty of water.

S36 Wear suitable protective clothing.

S39 Wear eye/face protection.

4.3 SPILLS AND DISPOSAL

Spills
Evacuate unprotected personnel from danger area. Shut off all possible sources of ignition. Remove any naked lights and strong heat sources. If spillage occurs in a confined space ensure adequate ventilation.

Disposal
If approved may be diluted and drained to a municipal sewer or waste treatment plant. Do not pump contaminated hydrogen peroxide into road tanker for disposal. Concentration of hydrogen peroxide can be checked by titration method. Treatment, storage, transportation and disposal of waste must be in accordance with applicable Federal, State and Local regulatory requirements.

4.4 FIRE AND EXPLOSION HAZARD

Fire / Explosion
Strong oxidiser. Contact with clothing or combustibles may cause fire. Contact with organic liquids or vapours may cause immediate fire or explosion, especially if heated, or may result in a delayed detonation. Polymerisation: will not occur. Instability: unstable with heat or contamination; liberation of oxygen gas may result in dangerous pressures. Incompatibility: incompatible with cyanides, hexavalent chromium compounds, nitric acid, potassium permanganate, many other oxidising and reducing agents, and many flammables.

Decomposition: Contamination from any source may cause rapid (or self-accelerating) decomposition, oxygen gas release, and dangerous pressures. May react dangerously with rust, dust, dirt, iron, copper, heavy metals or their salts (such as mercuric oxide or chloride), alkalis, and with organic materials (especially

Extinguishing Media

Only water is recommended to fight fires involving hydrogen peroxide. Wear self-contained breathing apparatus. Wear full protective equipment. Flood with water. Use water spray to cool tanks, containers, equipment and lines not yet burning. This reduces the rate of hydrogen peroxide decomposition and prevents high pressure
buildups. Tanks which have become overheated should be approached cautiously because of possible explosion.

5 OTHER INFORMATION

Other Information

Aquatic toxicity: the 96 hour LC50 in catfish is 37.4 mg/L Dilute peroxide to 3% before discharge. Hydrogen peroxide naturally decomposes to water and oxygen.