



Safety Data Sheet
Isophorone Diamine
Revision 2, Date 01 Jan 2016

1. IDENTIFICATION

Product Name	Isophorone Diamine
Other Names	Cyclohexanemethanamine, 5-Amino-1,3,3-Trimethyl-
Uses	Curing agent in epoxies, coating, polyamine resins, raw materials for isophorone diisocyanate (IPDI)
Chemical Family	No Data Available
Chemical Formula	C ₁₀ H ₂₂ N ₂
Chemical Name	Isophorone Diamine
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) Not scheduled

Globally Harmonised System



Hazard Classification	Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)
Hazard Categories	Sensitisation (Skin) - Category 1 Long-term Hazard To The Aquatic Environment - Category 3 Skin Corrosion/Irritation - Category 1C Acute Toxicity (Oral) - Category 4 Acute Toxicity (Dermal) - Category 4 Serious Eye Damage/Irritation - Category 1

Pictograms	 
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Signal Word	Danger
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Hazard Statements	H302	Harmful if swallowed.
	H312	Harmful in contact with skin.
	H314	Causes severe skin burns and eye damage.
	H317	May cause an allergic skin reaction.
	H412	Harmful to aquatic life with long lasting effects.

Precautionary Statements	Prevention	P260	Do not breathe fume/gas/mist/vapours/spray.
		P270	Do not eat, drink or smoke when using this product.
		P272	Contaminated work clothing should not be allowed out of the workplace.
		P273	Avoid release to the environment.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
	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.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P310	Immediately call a POISON CENTER or doctor/physician.
		P321	Specific treatment (see First Aid Measures on Safety Data Sheet).
		P333 + P313	If skin irritation or rash occurs: Get medical advice/attention.
		P363	Wash contaminated clothing before reuse.
	Storage	P405	Store locked up.
	Disposal	P501	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)
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Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Health Hazards	6.1D	Substances that are acutely toxic - Harmful
		6.5B	Substances that are contact sensitisers

Environmental Hazards	8.2C	Substances that are corrosive to dermal tissue UN PGIII
	8.3A	Substances that are corrosive to ocular tissue
	9.1C	Substances that are harmful in the aquatic environment
	9.3C	Substances that are harmful to terrestrial vertebrates

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
3-Aminomethyl-3,5,5-Trimethylcyclohexylamine	No Data Available	2855-13-2	>=99.7 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	Immediately remove contaminated clothing. Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention. If danger of loss of consciousness, place patient in recovery position and transport accordingly. First aid personnel should pay attention to their own safety.
Eye	Immediately remove contaminated clothing. Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open. Consult an eye specialist. First aid personnel should pay attention to their own safety.
Skin	Immediately remove contaminated clothing. Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist. First aid personnel should pay attention to their own safety.
Inhaled	Immediately remove contaminated clothing. Keep patient calm, remove to fresh air, seek medical attention. Immediately inhale corticosteroid dose aerosol. If danger of loss of consciousness, place patient in recovery position and transport accordingly. Apply artificial respiration if necessary. First aid personnel should pay attention to their own safety.
Advice to Doctor	If contact strong alkaline substances for acute or repeated short time: sometimes because of soft tissue edema leading to respiratory difficult. If not directly tracheal intubation, cricothyroidotomy or tracheotomy is needed. Oxygen therapy if necessary. If swallowed: water and milk are the best diluent. Neutralizing agent should be banned. If contact with skin and eyes should be rinsed at 20-30 minutes of injury with physiological saline or water.
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.
Flammability Conditions	Product is a Combustible Liquid.
Extinguishing Media	Suitable extinguishing media include water spray, dry powder, foam, or carbon dioxide.
Fire and Explosion Hazard	The material is flammability. In a fire or heated, a pressure increase will occur and the container may burst. When burning can release the irritant or toxic aerosol.
Hazardous Products of Combustion	Combustible liquid. Incompatible with strong oxidising agents, acids, halogenated compounds, and sources of ignition. Hazardous decomposition products may include carbon oxides, nitrogen oxides, and nitrous gases.
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. 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.

Flash Point	112 °C Open Cup
Lower Explosion Limit	1.2 %
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	380 °C
Hazchem Code	2X

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Personnel involved in the clean up should wear full protective clothing as listed in section 8. Avoid accidents, clean up immediately. Evacuate all unnecessary personnel. Increase ventilation. Avoid walking through spilled product as it is slippery when spilt. Stop leak if safe to do so. Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Management. Use clean, non-sparking tools and equipment. Shut off all possible sources if ignition.
Clean Up Procedures	Collect the spill with sand, soil or vermiculite. Collect Recyclable products to the container and label the container, so that recycling with sand, soil or vermiculite. Collect up Solid residues and place it in a container suitably labelled so that waste treatment. Washing contaminated area, prevent waste flows into the gutter.
Containment	Stop leak if safe to do so.
Environmental Precautionary Measures	Isolation of contaminated area, restrict access. 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	Evacuate all unnecessary personnel.
Personal Precautionary Measures	Personnel involved in the clean up should wear full protective clothing as listed in section 8.

7. HANDLING AND STORAGE

Handling	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. Remove contaminated clothing and wash before reuse.
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. Segregate from acids and acid forming substances. Storage duration: 24 Months. From the data on storage duration in this safety data sheet no agreed statement regarding the warranty of application properties can be deduced. This product has a UN classification of 2289 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/package must comply with all applicable local legislation. Store in original packaging as approved by manufacturer.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No exposure standard has been established for this product by the Australian Safety and Compensation Council (ASCC).
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.
Personal Protection Equipment	RESPIRATOR: Respiratory protection in case of vapour/aerosol release. Gas filter for gases/vapours of organic compounds (boiling point >65, e. g. EN 14387 Type A) (AS1715/1716).

EYES: Chemical goggles to prevent splashing in the eyes (AS1336/1337).

HANDS: Suitable materials also with prolonged, direct contact (Recommended Protective index 6, corresponding > 480 minutes of permeation time) nitrile rubber (NBR) - 0.4 mm coating thickness; natural rubber/ natural latex (NR) - 0.5 mm coating thickness; chloroprene rubber (CR) - 0.5 mm coating thickness; polyvinylchloride (PVC) - 0.7 mm coating thickness; butyl rubber (butyl) - 0.7 mm coating thickness; fluoroelastomer (FKM) - 0.7 mm coating thickness (AS2161).

CLOTHING: Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (AS3765/2210).

Work Hygienic Practices

No Data Available

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Transparent liquid
Odour	Amine-like
Colour	Colourless to Yellow
pH	11.6
Vapour Pressure	2 Pa torr (@ 20 °C)
Relative Vapour Density	No Data Available
Boiling Point	247 °C
Melting Point	10
Freezing Point	10 °C
Solubility	Approx. 492g/L 23.8°C
Specific Gravity	0.92/cm ³ (20°C)
Flash Point	112 °C Open Cup
Auto Ignition Temp	380 °C
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	250-300 °C
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	0.99 (23°C; pH 6.3)
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	18mPas (20°C) (@ No Data Available)
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No Data Available
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	No Data Available
Release of Invisible Flammable Vapours and Gases	No Data Available

10. STABILITY AND REACTIVITY

Chemical Stability	Product is stable under normal conditions of use, storage and temperature. Corrosive Liquid. Combustible liquid.
Conditions to Avoid	High temperatures, static electricity, spark.
Materials to Avoid	Strong oxidizing agents, strong acids, combustible.
Hazardous Decomposition Products	When heating or burning, toxic nitrogen oxide and corrosive fumes released. Corrode copper, zinc and tin alloy. Heat released when contact with an acid. Combustion products may include: carbon oxides (CO, CO ₂) nitrogen oxides (NO, NO ₂ etc.)
Hazardous Polymerisation	Reacts with acids and strong oxidizing agents. Reacts with halogenated compounds. Strong exothermic reaction.

11. TOXICOLOGICAL INFORMATION

General Information	<p>Oral LD₅₀ Rat: 1030mg/Kg Primary skin irritation: Corrosive (Rabbit) Primary irritations of the mucous membrane rabbit: Risk of serious damage to eyes.</p> <p>Guinea pig maximization test: sensitizing (guinea pig) (OECD Guideline 406) Assessment of mutagenicity: No mutagenic effect was found in various tests with bacteria and mammalian cell culture. The substance was not mutagenic in animal tests.</p> <p>Assessment of carcinogenicity: No data available Reproduction toxicity: Repeated oral uptake of the substance did not cause damage to the reproductive organs. No data available concerning reproduction toxicity Assessment of teratogenicity: No indications of a developmental toxic/ teratogenic effect were seen in animal studies.</p> <p>Repeated or long-term exposure to corrosive substances, can lead to tooth from corrosion, oral inflammation and ulceration and osteonecrosis of the jaw.</p> <p>Bronchial irritation symptoms associated with cough, often attack will cause bronchial pneumonia get deterioration. Long term contact can cause dermatitis and conjunctivitis.</p>
Eye/Irritant	Causes burns. Corrosive! Damages eyes.
Ingestion	Harmful if swallowed. Ingestion cause chemical burns, cough, nausea, headache, sore throat, abdominal pain, diarrhoea and other symptoms.
Inhalation	Inhalation can lead to coughing, throat irritation.
Skin/Irritant	May cause skin redden, pain, burn. Vapor and aerosol are extremely irritating. If in eyes, it will cause serious damage.
Carcinogen Category	No Data Available

12. ECOLOGICAL INFORMATION

Ecotoxicity	<p>LC₅₀ (96 h) 110 mg/l, <i>Leuciscus idus</i> (Directive 84/449/EEC, C.1, semistatic) Nominal values (confirmed by concentration control analytics) EC₅₀ (48 h) 23 mg/l, <i>Daphnia magna</i> (OECD Guideline 202, part 1, static) Nominal values (confirmed by concentration control analytics) EC₅₀ (48 h) 388 mg/l, <i>Chaetogammarus marinus</i> (semistatic) The details of the toxic effect relate to the nominal concentration.</p> <p>EC₅₀ (72 h) > 50 mg/l (growth rate), <i>Scenedesmus subspicatus</i> (Directive 88/302/ EEC, part C, p. 89) Nominal concentration.</p> <p>EC₁₀ (18 h) 1,120 mg/l, <i>Pseudomonas putida</i> (DIN 38412 Part 8) Nominal concentration.</p> <p>Chronic toxicity to aquatic invertebrates: No observed effect concentration (21 d), 3 mg/l, <i>Daphnia magna</i> (OECD Guideline 202, part 2, semistatic) Nominal values (confirmed by concentration control analytics)</p>
Persistence/Degradability	<p>Assessment biodegradation and elimination (H₂O): Not readily biodegradable (by OECD criteria).</p> <p>Elimination information: 8 % DOC reduction (28 d) (Directive 92/69/EEC, C.4-A) (aerobic, predominantly domestic sewage) Assessment of stability in water: In contact with water the substance will hydrolyse slowly.</p> <p>Information on Stability in Water (Hydrolysis): t_{1/2} < 10 % (5 h) (50°C, pH value 4.7 - 9.0), (OECD Guideline 111) Other adverse effects: Adsorbable organically-bound halogen (AOX): This product contains no organically-bound halogen.</p>

Mobility	Assessment transport between environmental compartments: The substance will not evaporate into the atmosphere from the water surface. Adsorption to solid soil phase is possible.
Environmental Fate	Harmful to aquatic organisms; may cause long term adverse effects in the aquatic environment. Do NOT let product reach waterways, drains and sewers. Additional information: Other ecotoxicological advice: Due to the pH-value of the product, neutralization is generally required before discharging sewage into treatment plants. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.
Bioaccumulation Potential	Accumulation in organisms is not to be expected. Literature data.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility.
Special Precautions for Land Fill	Contact a specialist disposal company or the local waste regulator for advice. Incinerate in suitable incineration plant, observing local authority regulations.

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name	ISOPHORONEDIAMINE
Class	8 Corrosive Substances
Subsidiary Risk(s)	C1 Combustible Liquids - Flash Point >60°C - <=93°C, Closed Cup
EPG	36 Toxic And/Or Corrosive Substances Combustible
UN Number	2289
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (Malaysia)

ADR

Proper Shipping Name	ISOPHORONEDIAMINE
Class	8 Corrosive Substances
Subsidiary Risk(s)	C1 Combustible Liquids - Flash Point >60°C - <=93°C, Closed Cup
EPG	36 Toxic And/Or Corrosive Substances Combustible
UN Number	2289
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (New Zealand)

NZS5433

Proper Shipping Name	ISOPHORONEDIAMINE
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available

EPG	36 Toxic And/Or Corrosive Substances Combustible
UN Number	2289
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)

US DOT

Proper Shipping Name	ISOPHORONEDIAMINE
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	153 Substances - Toxic and/or Corrosive (Combustible)
UN Number	2289
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Sea Transport

IMDG Code

Proper Shipping Name	ISOPHORONEDIAMINE
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2289
Hazchem	2X
Pack Group	III
Special Provision	No Data Available
EMS	FA,SB
Marine Pollutant	Yes

Air Transport

IATA DGR

Proper Shipping Name	ISOPHORONEDIAMINE
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2289
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

National Transport Commission (Australia)

Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)
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15. REGULATORY INFORMATION

General Information	No Data Available
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Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code HSR003899

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	Not Determined
Europe (REACH)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined
Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Related Product Codes	ISDIAM1000, ISDIAM1001, ISDIAM2000, ISDIAM2001, ISDIAM2002, ISDIAM2003, ISDIAM2100, ISDIAM2200, ISDIAM2201, ISDIAM2202, ISDIAM2400, ISDIAM3000, ISDIAM4000, ISDIAM5000, ISDIAM5001, ISDIAM5002, ISDIAM6000, ISDIAM6001, ISDIAM6002
Revision	2
Revision Date	01 Jan 2016
Reason for Issue	Updated SDS
Key/Legend	<p>< Less Than > Greater Than AICS Australian Inventory of Chemical Substances atm Atmosphere CAS Chemical Abstracts Service (Registry Number) cm² Square Centimetres CO₂ Carbon Dioxide COD Chemical Oxygen Demand deg C (°C) Degrees Celcius EPA (New Zealand) Environmental Protection Authority of New Zealand deg F (°F) Degrees Farenheit g Grams</p>

g/cm³ 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 insoluble in each other.
inHg Inch of Mercury
inH₂O Inch of Water
K Kelvin
kg Kilogram
kg/m³ 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
m³ Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m³ 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 Health 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