1. IDENTIFICATION

Product Name	**Formic Acid 10%**
Other Names	No Data Available
Uses	Dying & finishing of textiles & paper; Leather treatment; chemical synthesis; manufacture of fumigants, insecticides, refrigerants, solvents for perfume, laquers; electoplating; medicine; brewing (ANTISEPTIC); silvering glass; cellulose formate; natural latex, coagulant; ore floatation; vinyl resin plasticers
Chemical Family	No Data Available
Chemical Formula	CH2O2
Chemical Name	Formic Acid 10%
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) 5

Globally Harmonised System

Hazard Classification		Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)	
Hazard Categories		Skin Corrosion/Irritation - Category 2	
		Acute Toxicity (Oral) - Category 4	
		Acute Toxicity (Inhalation) - Category 4	
		Serious Eye Damage/Irritation - Category 1	
Pictograms			
Signal Word		Danger	
Hazard Statements		**H302**	Harmful if swallowed.
		H315	Causes skin irritation.
		H318	Causes serious eye damage.
		H332	Harmful if inhaled.
Precautionary Statements	Prevention	**P261**	Avoid breathing dust/fume/gas/mist/vapours/spray.
		P264	Wash contacted areas thoroughly after handling.
		P270	Do not eat, drink or smoke when using this product.
		P271	Use only outdoors or in a well-ventilated area.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
	Response	**P301 + P312**	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
		P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
		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.
		P312	Call a POISON CENTER or doctor/physician if you feel unwell.
		P321	Specific treatment (see ... on this label).
		P330	Rinse mouth.
		P332 + P313	If skin irritation occurs: Get medical advice/attention.
		P362	Take off contaminated clothing and wash before reuse.
	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)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Formic acid	No Data Available	64-18-6	10 %

Other ingredients not considered hazardous by SWA	No Data Available		to 100 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	If poisoning occurs, contact Poisons Information Centre (Phone Australia 131126, New Zealand 0800 764 766) or a doctor. Immediately rinse mouth out with water. If swallowed, do NOT induce vomiting. Seek immediate medical advice.
Eye	If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
Skin	If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor.
Inhaled	If inhaled, remove from contaminated area. Apply artificial respiration if not breathing. Seek medical assistance if the effects persist
Advice to Doctor	Treat symptomatically.
Medical Conditions Aggravated by Exposure	No Data Available

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, remove containers from the path of fire.
Flammability Conditions	No Data Available
Extinguishing Media	Water spray, foam, carbon dioxide or dry chemical powder – Do not use water jets.
Hazardous Products of Combustion	The product will support combustion of oxidisable materials. Vapour may travel to source of ignition and flash back. On burning, will emit toxic fumes, including oxides of carbon. The packaging material may burn to emit noxious fumes
Special Fire Fighting Instructions	Fire fighters should wear self-contained breathing apparatus and acid-resistant chemical splash unit to minimise risk of exposure. If safe to do so, remove undamaged containers from the path of fires. Cool containers with flooding quantities of water until well after fire is out. Avoid getting water inside containers.
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). Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources.
Flash Point	No Data Available
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	•2X

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Shut off leak if safe to do so. Eliminate all sources of ignition (no smoking, flares, sparks or flame). All equipment used must be earthed. Spillages are slippery. Ensure adequate ventilation, work up wind or increase ventilation. Avoid accidents, clean up immediately. Wear protective equipment to prevent skin and eye contamination and inhalation of mists
Clean Up Procedures	Absorb with dry earth, sand or other non-combustible material. Neutralise with lime or soda ash. Use clean non-sparking tools to collect and seal in properly labelled drums for disposal in an area approved by local authority by-laws. Wash area down with excess water to remove residual material.
Containment	Contain the spill and prevent run off into confined areas, drains and waterways.
Evacuation Criteria	Keep spectators away – rope off the area.

7. HANDLING AND STORAGE

Handling	Keep containers closed at all times - check regularly for leaks or spills. Transport and store upright. Use in a well ventilated area. Do not use in confined spaces. Build up of mists or vapours in the atmosphere must be prevented. Avoid breathing spray, mists or vapours. Do not use near welding or other ignition sources and avoid sparks. Avoid eye contact and repeated or prolonged skin contact. Do not eat, drink or smoke in contaminated areas. Always remove contaminated clothing and wash hands before eating, drinking, smoking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.
Storage	Store in the original container, in a cool dry well-ventilated area out of sunlight and away from heat, ignition sources, oxidising agents and other combustible materials and foodstuffs. Do not store in confined spaces. Keep containers closed when not in use to ensure contamination does not occur - check regularly for leaks. Do not combine part drums of the same product, as this may be a source of contamination. Do not mix with other chemicals. Do not pressurise, cut, heat or weld containers as they may contain hazardous residues. This material is a Scheduled Poison S5 and must be stored, maintained and used in accordance with the relevant regulations.
Container	DO NOT INCINERATE, the by-products can be hazardous.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No value assigned for this specific material by Safe Work Australia (SWA), however as published by SWA: T.W.A. for Formic acid = 5 ppm (9.4 mg/m3) S.T.E.L. for Formic acid = 10 ppm (19 mg/m3)
Exposure Limits	No Data Available
Biological Limits	No biological limit allocated.
Engineering Measures	Ensure ventilation is adequate to maintain air concentrations below Exposure Standards. If inhalation risk exists then use with local exhaust ventilation or while wearing air supplied respirator. Vapour heavier than air - prevent concentration in hollows or sumps. DO NOT enter confined spaces where vapour may have collected. Keep containers closed when not in use.
Personal Protection Equipment	Protective equipment must be worn at all times. Risk assessments should always be conducted to identify the hazards and in turn determine the appropriate personal protective equipment for the hazard. Protective gloves: laminate film, elbow-length supported or unsupported neoprene, neoprene/latex blend or PVC impervious gloves. Always check with the glove manufacturer or your personal protective equipment supplier regarding the correct type of glove to use. Consult AS/NZS 2161 for further information. Eye protection: safety glasses/goggles with side shield protection and/or full-face shield. Consult AS/NZS 1336 and AS/NZS 1337 for further information. Clothing and footwear: waterproof apron, coveralls, trousers, long sleeved shirt, closed in shoes and/or safety footwear. Consult AS/NZS 2210 and AS/NZS 2919 for further information. Respiratory Protection: Avoid breathing mist, sprays or vapours. Where ventilation is not adequate, respiratory protection may be required. Any air-purifying respirator with an organic gases and vapour filter or any chemical cartridge respirator with an organic vapour cartridge(s) providing protection against the compound of concerns meeting the requirements of AS/NZS 1715 and AS/NZS 1716.
Work Hygienic Practices	Wash hands after handling this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Fuming liquid
Odour	Pungent odour
Colour	Clear, colourless
pH	<2
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	No Data Available
Freezing Point	No Data Available
Solubility	Miscible in water, alcohol, ether and glycerol
Specific Gravity	1.0242
Flash Point	No Data Available

Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	No Data Available
VOC Volume	No Data Available
Additional Characteristics	Reacts with alkalis and amines. Exothermic reaction.
Potential for Dust Explosion	No Data Available
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

General Information	Reacts with alkalis and amines. Exothermic reaction.
Chemical Stability	Stable under normal conditions of use.
Conditions to Avoid	Do not combine part drums of the same product, as this may be a source of contamination. Avoid exposure to heat, direct sunlight, open flames or other sources of ignition. Avoid exposure to moisture air or water.
Materials to Avoid	Alkalis (eg ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), aluminium, iron, steel, metals, finely divided metals, oxidising agents, reducing agents, permanganates, sulfuric acid, hydrogen peroxides, nitro compounds (eg nitrobenzene, nitroglycerine, picric acid, trinitrotoluene), cyanide compounds, catalysts and many plastics.
Hazardous Decomposition Products	Thermal decomposition may result in the release of toxic and/or irritating fumes including carbon monoxide and carbon dioxide. The packaging material may burn to emit noxious fumes.
Hazardous Polymerisation	No Data Available

11. TOXICOLOGICAL INFORMATION

General Information	No toxicity data for this specific product, however toxicity data for the hazardous ingredient is listed below. TOXICITY DATA FOR FORMIC ACID: Oral LDLo(woman) 2.44 mg/kg Oral LD50 (rat) 1100 mg/kg Inhalation LC50 (rat) 15,000 mg/m3/15min Oral LD50 (mouse) 700 mg/kg Inhalation LC50 (mouse) 6,200 mg/m3/15min Skin Irritation Data

(rabbit) 610 mg – mild effect (open irritation test) Eyes Irritation Data (rabbit) 122 mg - severe effect.
Available evidence from animal studies indicate that repeated or prolonged exposure to a component of this material could result in effects on the respiratory system. Prolonged or repeated skin exposure may result n dermatitis.

Acute

EyeIrritant	Corrosive to eyes and may injure the cornea. Contamination of eyes can result in permanent injury. Symptoms include stinging, tearing, redness and swelling of eyes.
SkinIrritant	Corrosive to skin - may cause skin burns. May not produce an immediate burning sensation upon contact, delaying the awareness that contact has occurred. Symptoms may include redness, burning, and swelling of skin, burns, and other skin damage.
Inhalation	Breathing in mists or aerosols may produce respiratory irritation.
Carcinogen Category	No Data Available

12. ECOLOGICAL INFORMATION

Ecotoxicity	LC50 Bluegill (Lepomis macrochirus) 175 mg/L/24hr LC50 Green or European shore crab (Carcinus maenas) 80 - 90 mg/L/48hr LC50 Brine Shrimp (Artemia salina) 410 mg/L/24hr (NAUPLII - larval stage)
Persistence/Degradability	Considered to be readily biodegradable.
Mobility	No information available.
Environmental Fate	Avoid contaminating waterways. The product is highly acidic. If large spills occurred a water pH drop could be responsible for an environmental effect on aquatic organisms.
Bioaccumulation Potential	No information available.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Empty containers should be forwarded to an approved agent for recycling. Avoid unauthorised discharge to sewer. Advise its corrosive, toxic, sensitising and combustible liquid nature. Empty containers must be decontaminated
Special Precautions for Land Fill	The product is suitable for disposal by landfill through an approved agent. Incineration of the product is not recommended, as the by-products may be hazardous.

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name	FORMIC ACID with not less than 5% but less than 10% acid by mass
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	3412
Hazchem	•2X
Pack Group	III
Special Provision	No Data Available
Comments	Not to be loaded with Explosives (Class 1), Dangerous when wet substances (class 4.3), Oxidizing substances (Class 5.1), Organic peroxides (Class 5.2), Toxic substances (Class 6) when the substance is a cyanide compound, Radioactive material (Class 7), Corrosives (strong alkalis of class 8), Food or food empties, however exemptions may apply.

Land Transport (Malaysia)
ADR

Proper Shipping Name	FORMIC ACID with not less than 5% but less than 10% acid by mass
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	3412
Hazchem	•2X
Pack Group	III
Special Provision	No Data Available
Comments	Not to be loaded with Explosives (Class 1), Dangerous when wet substances (class 4.3), Oxidizing substances (Class 5.1), Organic peroxides (Class 5.2), Toxic substances (Class 6) when the substance is a cyanide compound, Radioactive material (Class 7), Corrosives (strong alkalis of class 8), Food or food empties, however exemptions may apply.

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	FORMIC ACID with not less than 5% but less than 10% acid by mass
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	3412
Hazchem	•2X
Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	FORMIC ACID with not less than 5% but less than 10% acid by mass
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	36 Toxic And/Or Corrosive Substances Combustible
UN Number	3412
Hazchem	•2X
Pack Group	III
Special Provision	No Data Available

Sea Transport
IMDG Code

Proper Shipping Name	FORMIC ACID with not less than 5% but less than 10% acid by mass
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	3412
Hazchem	•2X
Pack Group	III
Special Provision	No Data Available
EMS	F-S,
Marine Pollutant	No

Comments	Not to be loaded with Explosives (Class 1), Dangerous when wet substances (class 4.3), Oxidizing substances (Class 5.1), Organic peroxides (Class 5.2), Toxic substances (Class 6) when the substance is a cyanide compound, Radioactive material (Class 7), Corrosives (strong alkalis of class 8), Food or food empties, however exemptions may apply.

Air Transport
IATA DGR

Proper Shipping Name	FORMIC ACID with not less than 5% but less than 10% acid by mass
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	3412
Hazchem	•2X
Pack Group	III
Special Provision	No Data Available
Comments	Not to be loaded with Explosives (Class 1), Dangerous when wet substances (class 4.3), Oxidizing substances (Class 5.1), Organic peroxides (Class 5.2), Toxic substances (Class 6) when the substance is a cyanide compound, Radioactive material (Class 7), Corrosives (strong alkalis of class 8), Food or food empties, however exemptions may apply.

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)

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	5

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	Not Assessed

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	200-579-1
Europe (REACh)	01-2119491174-37-0006
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined

New Zealand (NZIoC)	Not Determined
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	FORMIC1802, FORMIC1832, FORMIC1833, FORMIC1836, FORMIC1837, FORMIC1838, FORMIC1839, FORMIC1842
Revision	1
Revision Date	10 Feb 2016
Reason for Issue	New SDS
Key/Legend	**<** 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 **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 insoluable 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 Heath and Safety Commission **OECD** Organisation for Economic Co-operation and Development **Oz** Ounce **PEL** Permissible Exposure Limit **Pa** Pascal

ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight