



SAFETY DATA SHEET FERRIC CHLORIDE SOLUTION REVISION 5, DATE 01 MAR 2021

1. IDENTIFICATION

Product Name	Ferric Chloride Solution
Other Names	Ferric Chloride Liquid
Uses	Coagulation and clarification of drinking water, process water and wastewater treatment units; Flocculant; Precipitant.
Chemical Family	No Data Available
Chemical Formula	Unspecified
Chemical Name	Iron chloride (FeCl ₃), aqueous solution
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox 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 Corrosive to Metals - Category 1
Acute Toxicity (Oral) - Category 4
Skin Corrosion/Irritation - Category 1C
Serious Eye Damage/Irritation - Category 1

Pictograms

Signal Word Danger

Hazard Statements

H290	May be corrosive to metals.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.

Precautionary Statements	Prevention	P270	Do not eat, drink or smoke when using this product.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
		P390	Absorb spillage to prevent material-damage.
	Response	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.
		P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
		P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
		P363	Wash contaminated clothing before reuse.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep comfortable for breathing.
		P406	Store in corrosive resistant container with a resistant inner liner.
Storage	P406	Store in corrosive resistant container with a resistant inner liner.	
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
Iron chloride	FeCl ₃	7705-08-0	35 - 45 %
Hydrochloric acid	HCl	7647-01-0	<=0.5 %
Water	H ₂ O	7732-18-5	Balance %

4. FIRST AID MEASURES*Description of necessary measures according to routes of exposure*

Swallowed	IF SWALLOWED: Rinse mouth, then drink a glass of water. Do not induce vomiting. Immediately call a Poison Centre or doctor/physician for advice. Never give anything by mouth to an unconscious person.
Eye	IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue rinsing for at least 15 minutes. Immediately call a Poison Centre or doctor/physician for advice.
Skin	IF ON SKIN: Remove contaminated clothing and shoes immediately. Flush skin with running water for at least 15 minutes. For minor skin contact, avoid spreading material on unaffected skin. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing and shoes before reuse.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a Poison Centre or doctor/physician for advice. Apply resuscitation if victim is not breathing - Do not use direct mouth-to-mouth method if victim ingested or inhaled the substance; use alternative respiratory method or proper respiratory device - Administer oxygen if breathing is difficult.
Advice to Doctor	Treat symptomatically. Keep victim calm and warm - Obtain immediate medical care. Ensure that attending medical personnel are aware of the identity and nature of the product(s) involved, and take precautions to protect themselves.
Medical Conditions Aggravated by Exposure	No information available.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out. Avoid getting water inside containers.
Flammability Conditions	Non-combustible; Material itself does not burn.
Extinguishing Media	If material is involved in a fire, use an extinguishing agent suitable for the surrounding fire.
Fire and Explosion Hazard	Contact with metals may evolve flammable hydrogen gas. Closed containers exposed to heat may explode.
Hazardous Products of Combustion	Fire or heat will produce irritating, toxic and/or corrosive gases, including Hydrogen chloride gas.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may be toxic and/or corrosive and may pollute waterways.
Personal Protective Equipment	Wear positive pressure self-contained breathing apparatus (SCBA) and chemical splash suit. Fully-encapsulating, gas-tight suits should be worn for maximum protection. Structural firefighter's uniform is NOT effective for this material.
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	Ensure adequate ventilation - Ventilate enclosed spaces before entering. ELIMINATE all ignition sources. Do not touch or walk through spilled material - high slip hazard. Do not breathe vapours and prevent contact with eyes, skin and clothing.
Clean Up Procedures	Absorb with earth, sand or other non-combustible material and transfer to a suitable container for disposal (see SECTION 13). *Contaminated absorbent material may pose the same hazard as the spilt product.
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. Use water spray to reduce vapours. Move containers from spill area.

Decontamination	The spilled material may be neutralized with sodium carbonate, sodium bicarbonate or sodium hydroxide. Flush spill area with water.
Environmental Precautionary Measures	Spillages and decontamination runoff should be prevented from entering drains and watercourses.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away. Keep upwind and to higher ground.
Personal Precautionary Measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Avoid aerosol formation. Do not breathe mist/aerosols and prevent contact with eyes, skin and clothing. Do not ingest. Wear protective gloves/protective clothing/eye protection/face protection (see SECTION 8). Absorb spillage to prevent material damage (see SECTION 6).
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Keep away from heat and sources of ignition - No smoking. Keep away from foodstuffs and incompatible materials (see SECTION 10). Use appropriate containment to avoid environmental contamination.
Container	Keep only in the original container or an approved alternative made from a compatible material. Do not store in unlabelled containers. *Containers of this material may be hazardous when empty since they retain product residues (vapours, liquid); observe all warnings and precautions listed for the product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No specific exposure standards are available for this product. For Iron salts, soluble (as Fe): - Safe Work Australia Exposure Standard: TWA = 1 mg/m ³ . - New Zealand Workplace Exposure Standard: TWA = 1 mg/m ³ . COMPONENT: Hydrogen chloride (CAS No. 7647-01-0): - Safe Work Australia Exposure Standard: TWA = 5 ppm (7.5 mg/m ³) Peak limitation. - New Zealand Workplace Exposure Standard: TWA = 5 ppm (7.5 mg/m ³) Ceiling.
Exposure Limits	No Data Available
Biological Limits	No information available.
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	- Respiratory protection: In case of inadequate ventilation, wear respiratory protection. Recommended: For high concentration, combination filter device (refer to AS/NZS 1715 & 1716). For emergencies, or instances where the exposure levels are not known, use a full face piece positive pressure, air supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen deficient atmospheres. - Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Use chemical safety goggles and/or full face shield where splashing is possible. - Hand protection: Wear protective gloves. Recommended: Chemical-resistant, impervious gloves (elbow-length), e.g. NR (natural rubber (caoutchouc, natural latex), CR (chloroprene rubber), NBR (nitrile rubber), butyl rubber, FKM (fluororubber), PVC (polyvinyl chloride). - Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Wear impervious protective clothing, including boots, gloves lab coat, apron or coveralls, as appropriate.
Special Hazards Precautions	No information available.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash hands before breaks and at the end of work. Wash contaminated clothing prior to re-use.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid
Appearance	Liquid
Odour	Characteristic, acid
Colour	Orange to reddish-brown
pH	1 - 2
Vapour Pressure	40 mmHg (@ 20 °C)
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	No Data Available
Freezing Point	No Data Available
Solubility	Completely soluble in water
Specific Gravity	1.42 +/- 0.02
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	1.43 g/cm3
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	No information available.
Potential for Dust Explosion	Not applicable.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.
Properties That May Initiate or Contribute to Fire Intensity	Non-combustible; Material itself does not burn.
Reactions That Release Gases or Vapours	Fire or heat will produce irritating, toxic and/or corrosive gases, including Hydrogen chloride gas.
Release of Invisible Flammable Vapours and Gases	Contact with metals may evolve flammable hydrogen gas.

10. STABILITY AND REACTIVITY

General Information	May be corrosive to metals.
Chemical Stability	Stable under normal temperature conditions and recommended use.
Conditions to Avoid	Avoid exposure to heat and light. Avoid contact with incompatible materials.
Materials to Avoid	Incompatible/reactive with metals, alkalis, strong oxidising agents, reducing agents.
Hazardous Decomposition Products	Fire or heat will produce irritating, toxic and/or corrosive gases, including Hydrogen chloride gas. Contact with metals may evolve flammable hydrogen gas.
Hazardous Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION

General Information	<ul style="list-style-type: none"> - Acute toxicity: Harmful if swallowed. Ingestion may cause burns to mouth, throat and stomach. Adverse symptoms may include stomach pains. - Skin corrosion/irritation: Causes severe skin burns. Contact with skin will result in severe irritation. Corrosive to skin - may cause skin burns. - Eye damage/irritation: Causes serious eye damage. Corrosive to eyes; contact can cause corneal burns. Contamination of eyes can result in permanent injury. - Respiratory/skin sensitisation: No danger of sensitisation. - Germ cell mutagenicity: No known significant effects or critical hazards. - Carcinogenicity: No known significant effects or critical hazards. - Reproductive toxicity: No known significant effects or critical hazards. - STOT (single exposure): Breathing in mists or aerosols may produce respiratory irritation. Vapour may be very irritating or corrosive to the respiratory system. - STOT (repeated exposure): No systemic toxicity is expected following repeated exposure. May affect the liver. - Aspiration toxicity: No information available.
Acute	
Ingestion	Acute toxicity (Oral): COMPONENT: Iron chloride (CAS No. 7705-08-0): - LD50, Mouse: 1,300 mg/kg bw.
Other	Acute toxicity (Dermal): COMPONENT: Iron chloride (CAS No. 7705-08-0): - LD50, Rat: >2,000 mg/kg bw.
Carcinogen Category	None

12. ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic toxicity: - LC50, Fish (<i>Oryzias latipes</i>): 46.6 mg/L (96 h). - EC50, Crustacea (<i>Daphnia magna</i>): 19.0 mg/L (48 h). - ErC50, Algae (<i>Selenastrum capricornutum</i>): 6.9 mg/L (72 h).
Persistence/Degradability	No information available.
Mobility	No information available.
Environmental Fate	No known significant effects or critical hazards. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.
Bioaccumulation Potential	No information available.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS**General Information**

The generation of waste should be avoided or minimised wherever possible. Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Special Precautions for Land Fill

This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Handle contaminated packaging in the same way as the substance itself.

14. TRANSPORT INFORMATION**Land Transport (Australia)**

ADG Code

Proper Shipping Name	FERRIC CHLORIDE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2582
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (Malaysia)

ADR Code

Proper Shipping Name	FERRIC CHLORIDE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2582
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (New Caledonia)

Proper Shipping Name	FERRIC CHLORIDE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2582
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (New Zealand)

NZS5433

Proper Shipping Name	FERRIC CHLORIDE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2582
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)

US DOT

Proper Shipping Name	FERRIC CHLORIDE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	154 Substances - Toxic and/or Corrosive (Non-Combustible)
UN Number	2582
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Sea Transport

IMDG Code

Proper Shipping Name	FERRIC CHLORIDE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2582
Hazchem	2X
Pack Group	III
Special Provision	No Data Available
EMS	F-A, S-B
Marine Pollutant	No

Air Transport

IATA DGR

Proper Shipping Name	FERRIC CHLORIDE SOLUTION
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2582
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)

15. REGULATORY INFORMATION**General Information**

No Data Available

Poisons Schedule (Aust)

Not Scheduled

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code

Additives Process Chemicals and Raw Materials Corrosive Group Standard 2020 HSR002491
*HSR004519 (Revoked)

National/Regional Inventories**Australia (AIC)**

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**

FECHLO1800, FECHLO1801, FECHLO1802, FECHLO1803, FECHLO1804, FECHLO1805, FECHLO1806, FECHLO1807, FECHLO1808, FECHLO1809, FECHLO1810, FECHLO1811, FECHLO1812, FECHLO1813, FECHLO1814, FECHLO1815, FECHLO1816, FECHLO1817, FECHLO1818, FECHLO1819, FECHLO1820, FECHLO1821, FECHLO1822, FECHLO1823, FECHLO1824, FECHLO1825, FECHLO1826, FECHLO1827, FECHLO1828, FECHLO1829, FECHLO1830, FECHLO1832,

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FECHLO1833, FECHSO0040, FECHSO0041, FECHSO0045, FECHSO1000, FECHSO1001, FECHSO1002, FECHSO1003, FECHSO1004, FECHSO1100, FECHSO1101, FECHSO1104, FECHSO1127, FECHSO1200, FECHSO1400, FECHSO1500, FECHSO1600, FECHSO2000, FECHSO2001, FECHSO2200, FECHSO2300, FECHSO2400, FECHSO2401, FECHSO2500, FECHSO2501, FECHSO2502, FECHSO2503, FECHSO2504, FECHSO2505, FECHSO2506, FECHSO2507, FECHSO2508, FECHSO2510, FECHSO2515, FECHSO2518, FECHSO2600, FECHSO2601, FECHSO2700, FECHSO2900, FECHSO2901, FECHSO2910, FECHSO3000, FECHSO3200, FECHSO3201, FECHSO3400, FECHSO3500, FECHSO3501, FECHSO3502, FECHSO3503, FECHSO3600, FECHSO3700, FECHSO3742, FECHSO3800, FECHSO3900, FECHSO4000, FECHSO4100, FECHSO4200, FECHSO4300, FECHSO4301, FECHSO4302, FECHSO4305, FECHSO4307, FECHSO4500, FECHSO5000, FECHSO5100, FECHSO5200, FECHSO5500, FECHSO5600, FECHSO6000, FECHSO6100, FECHSO8000

Revision

5

Revision Date

01 Mar 2021

Reason for Issue

SDS updated

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

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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