MATERIAL SAFETY DATA SHEET

IDENTIFICATION

SUBSTANCE: **FERRIC CHLORIDE SOLUTION**

CAS #: 7705-08-0

MANUFACTURER: Gulbrandsen Technologies, Inc.
2 Main Street
Clinton, NJ 08809

PRODUCT INFORMATION: (908) 735-5458

TRANSPORTATION EMERGENCY (CHEMTREC): (800) 424-9300

REVISION DATE: 12/01/2002

SUPERSEDES: 07/26/2002

INGREDIENTS

INGREDIENT	CAS #	PERCENTAGE
Water	7732-18-5	55 - 75
Ferric chloride	7705-08-0	25 - 45
Ferrous chloride	7758-94-3	0 - 3
Hydrochloric acid	7647-01-0	0 - 3

ALL INGREDIENTS ARE LISTED ON THE TSCA CHEMICAL SUBSTANCE INVENTORY

SECTION 313 SUPPLIER NOTIFICATION: The hydrochloric acid mentioned above is subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). This notification must be included in all MSDS's that are copied and distributed for this material.

PHYSICAL DATA

BOILING POINT:	106^{o}C (223^{o}F)	pH:	< 1
MELTING POINT:	-12^{o}C (10^{o}F) 40% Soln.	SOLUBILITY IN WATER:	Complete
SPECIFIC GRAVITY:	1.2 - 1.5	VAPOR PRESSURE:	40mm Hg @ 35^{o}C
% VOLATILE:	55 - 75 (water)	EVAPORATION RATE:	N/F[1]
VAPOR DENSITY:	Air=1, N/F[1]	MOLECULAR WEIGHT:	162.2
APPEARANCE:	Orange-brown liquid	ODOR:	Slightly acrid

FIRE AND EXPLOSION HAZARDS

FLASH POINT: N/A[2]
FLAMMABLE LIMITS IN AIR: UFL: N/A LFL: N/A (% BY VOLUME)
SPECIAL FIRE AND EXPLOSION HAZARDS: None
EXTINGUISHING MEDIA: Will not burn; use materials appropriate for surrounding fire.
SPECIAL FIRE FIGHTING INSTRUCTIONS: Cool exposed tanks with water.

REACTIVITY

STABILITY:	Stable
DECOMPOSITION:	Will not occur
POLYMERIZATION:	Will not occur
INCOMPATIBILITY:	Rapidly corrodes most metals (titanium is one exception); may generate flammable, potentially explosive hydrogen gas. Avoid contact with nylon, aluminum/aluminum alloys, carbon steel, stainless steel, and copper/copper alloys.

HEALTH HAZARDS

EXPOSURE LIMITS: Not specifically regulated as toxic or hazardous by OSHA. The ACGIH TLV for soluble iron salts is 1 mg/m^3 as Fe (8 hour time-weighted average). TLV for hydrochloric acid is 7.5 mg/m^3 (ceiling).

Toxic effects in animals from repeated exposure by ingestion include reduced weight gain, elevated serum iron levels, increased red blood cell counts, and iron deposition in many organs. Tests in bacterial and mammalian cell cultures demonstrate no genetic damage. Animal tests demonstrate no carcinogenicity.

Human health effects of overexposure by eye contact may include discoloration of eye tissues, eye irritation and discomfort, tearing and blurring of vision, or eye corrosion with corneal or conjunctival ulceration. Skin contact may cause skin irritation with discomfort or rash, skin burns, or ulceration. Ferric chloride has been infrequently associated with skin sensitization in humans. Overexposure by inhalation may result in irritation of the upper respiratory passages with coughing. Ingestion may cause corrosive damage to the GI tract. Repeated ingestion of sublethal doses may lead to excessive deposition in the tissues accompanied by pancreatic and liver damage.

Ingestion in higher doses may lead to abnormal liver function with nausea or vomiting, reduced appetite, abdominal pain, lethargy, tarry stools, diarrhea, fast and weak pulse, hypertension, dehydration, acidosis, and coma. Temporary alteration of the heart's electrical activity may result in irregular pulse, palpitations, or inadequate circulation. If death does not occur immediately, symptoms may clear in a few hours but return within a day with cyanosis, pulmonary edema, shock, convulsions, acidosis, fever, and death.

Individuals with pre-existing diseases of the liver may have increased susceptibility to the toxicity of repeated exposures.

CARCINOGENICITY: None of the components of this material are listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

FIRST AID

EYE:	Immediately flush eyes for 15 minutes with plenty of water. Call a physician.
SKIN:	Flush skin with water. Remove contaminated clothing; wash before reuse.
INHALATION:	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
INGESTION:	DO NOT INDUCE VOMITING. Give large quantities of water, then an antacid. Never give anything by mouth to an unconscious individual. Call a physician.

PERSONAL PROTECTION

Adequate general ventilation should be provided to keep vapor and mists below exposure limits.
Wear safety glasses with side shields. Wear a face shield if possibility of material splashing or spraying exists. Where there is possibility of skin contact, use the following as appropriate: gloves impervious to material, apron, boots, hood, pants, and jacket. Wear a NIOSH/OSHA approved respirator with a dust/mist cartridge if there is potential of exposure to mists in excess of applicable limits.

SPILL/LEAK PROCEDURE

Review safety precautions before proceeding with cleanup. Use appropriate personal protection equipment.

Neutralize spill with lime (calcium hydroxide), limestone (calcium carbonate), or soda ash (sodium carbonate). CAUTION: limestone and soda ash will evolve CO_2; ventilation should be provided in enclosed areas. Dike area around spill to prevent spreading, and use absorbent material to pick up spill.

CERCLA REPORTABLE DISCHARGE: 1000 lbs.

DISPOSAL: Under the Resource Conservation and Recovery Act (RCRA), it is the responsibility of the user to determine whether a substance should be classified as a hazardous waste at the time of disposal. This is due to the fact that product use, transformation, synthesis, mixtures, etc. may change the nature of the product. Dispose of waste in accordance with applicable federal, state, and local laws.

SHIPPING INFORMATION

DOT

PROPER SHIPPING NAME:	Ferric chloride solution
HAZARD CLASS:	Class 8
UN/NA #:	UN 2582
DOT LABELS:	Corrosive
DOT PLACARDS:	Corrosive
PACKAGING GROUP:	III

IMO

PROPER SHIPPING NAME:	Ferric chloride solution
HAZARD CLASS:	Corrosive material, 8
UN #:	2582
IMO LABEL:	Corrosive
PACKAGING GROUP:	III
REPORTABLE QUANTITY:	1000 lbs.
SHIPPING CONTAINERS:	Rubber-lined steel tank cars/trucks; polyethylene drums, bottles
STORAGE CONDITIONS:	Keep containers closed

TITLE III HAZARD CLASSIFICATIONS

ACUTE:	Yes
CHRONIC:	No
FIRE:	No
REACTIVITY:	No
PRESSURE:	No

EXTREMELY HAZARDOUS SUBSTANCE:	No	NFPA/HMIS RATINGS	
CERCLA HAZARDOUS SUBSTANCE:	Yes	HEALTH:	3
TOXIC CHEMICAL:	No	FLAMMABILITY:	0
CANADIAN WHMIS CLASSIFICATION:	E	REACTIVITY:	0

PPE rating to be supplied by user depending on use conditions.

ADDITIONAL INFORMATION AND REFERENCES

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[1]N/F = None found
[2]N/A = Not applicable