Signs and Symptoms of Exposure: Symptoms, if present, vary with individual. Watch for signs of allergic reaction, rash or respiratory distress.

Synergistic effects: No data Additional Information: N/A

ISECTION 12]: ECOLOGICAL INFORMATION

Ecotoxicity (Aquatic and Terrestrial toxicity): Variable data

Persistence and biodegradability: Possibility of Bio-concentration because of non-resolvability

Bioaccumulative potential: Non resolvability: high possibility of bioaccumulation due to hard resolvability (Est.)

Mobility in soil: Possibility of absorption into soil

Other adverse effects: No data

[SECTION 13]: DISPOSAL CONSIDERATION

Product: Comply with all federal, state and local regulations for disposal of waste oils. High temperature incineration.

Do not dump this product into sewers, on the ground or into any body of water.

Contaminated packaging: Dispose of as unused product, high temperature incineration.

[SECTION 14]: TRANSPORT INFORMATION

DOT (US)

Hazard class: Combustible Liquid

UN No: N/A

Packing Group: III

Proper bulk shipping description: Hydrocarbons, Liquid, N.O.S.

Proper non-bulk shipping description: Not restricted

Reportable Quantity: None Marine Pollutant: No Reference

Poison Inhalation Hazard: N/A

Hazard class: Combustible Liquid

UN No: N/A

Packing Group: III

Proper bulk shipping description: Not restricted

Proper non-bulk shipping description: Not restricted

ICAO shipping description: Not restricted ADR/RID hazard class: Not restricted

IATA

Hazard class: GHS Class 4 Combustible

UN No: N/A

Packing Group: III

Proper bulk shipping description: Not restricted

Proper non-bulk shipping description: Not restricted

[SECTION 15]: REGULATORY INFORMATION

OSHA Hazards: N/A

DSL Status: N/A

SARA 302 Components: N/A

SARA 313 Components: N/A

Composition A Magnetite (Fe3O4)

CAS No. 1309-38-2 **TSCA** Registered

EINECS Registered

Registered

B Oil Soluble Dispersant Proprietary Registered C Light Hydrocarbon Oil Proprietary Registered

Registered Registered Registered

OSHA

Registered

These components do not contain any chemical subject to the reporting requirements of Section 313 of Title III of the Superfund Amendment and Reauthorization Act (SARA) of 1986 and 40 CFR part 372.

ISECTION 161: OTHER INFORMATION

We believe the statements, technical information and recommendations contained herein to be reliable, but they are given without warranty or guarantee of any kind, express or implied, and we assume no responsibility for any loss, damage or expense, direct or consequential, arising from their use.

This material is not sold for use in products for which prolonged contact with skin or implantation into the human body is intended. We do not recommend this material as safe and effective for such uses and assume no liability for any such

RoHS compliance statement: This material complies with RoHS standards.

REACH 2 Compliance Statement: This material is believed to comply with REACH standards.

Date of last revision and revision level: 25-August, 2014, Rev. A Date of preparation: 29-May, 2014



August 2014

Safety Data Sheet

[SECTION 1]: PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name

: FFH Series Ferrofluid

Chemical Name

Proprietary Product

Chemical Formula

: Mixture : Colloidal Dispersion

Chemical Family

: Educational/Research/Artistic Applications

Relevant Identified Use

Uses Advised Against

: Loudspeaker Applications and any app. that requires long fluid life

Manufacturer's Name

: Ferrotec Corporation

: Ferrotec (USA) Corporation, 33 Constitution Dr., Bedford, NH 03110, USA

Importers / Distributor Telephone Number

Emergency Tel. Number

: (603) 472-6800 +1 (800)424-9300 (CHEMTREC - US only)

+1 (703)527-3887 (CHEMTREC - International)

Other safety information : +81-479-73-6752 (FERROTEC CORP. - Japan)

+49-7022-9270-0 (FERROTEC GmbH - Germany

[SECTION 2]: HAZARD IDENTIFICATION

Skin Corrosion / Irritation: Category 2

Severe Eve Damage / Irritation: Category 2 : Not Established

Target Organs

Acute Aquatic Toxicity: Category 1

Chronic Aquatic Toxicity: Category 1 GHS Label Elements, including precautionary statements -

Pictogram:





Signal word: Warning

Hazard statement(s):

H315 Cause skin irritation

H319 Cause serious eye irritation

H400 Very toxic to aquatic life

H4100 Very toxic to aquatic life with long lasting effects

Precautionary statement(s):

-Prevention

P264 Wash thoroughly after handling

P273 Avoid release to the environment

P280 Wear protective gloves / protective clothing / eye protection / face protection.

P302+P352 If on skin: Wash with plenty of soap and water

P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if possible and easy to do. Continue rinsing.

P332+P313: IF skin irritation occurs: Get medical advice/attention.

P337+P313: If eye irritation persists: Get medical advice/attention.

P362 Take off contaminated clothing and wash before reuse.

P391 Collect spillage

Any hazards not otherwise classified or identified during classification process: GHS Class 4 Combustible

% of mixture consisting of ingredient(s) of unknown toxicity: N/A

HMIS Classification:

NFPA Rating:

Health hazard: 1 Chronic Health Hazard: N/A Health Hazard: 1

Flammability: 2

Reactivity Hazard: 0

Physical hazards: 0

Fire: 2

Potential Health Effects

Inhalation: Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Skin: Potential skin irritant

Eves: Potential eve irritant

Ingestion: No significant health hazard [SECTION 3]: COMPOSITION / INGREDIENT INFORMATION

Synonyms: N/A

The precise composition of this mixture is proprietary information.

A more complete disclosure will be provided to a physician or a nurse in the event of a medical emergency. All composistered in Chemical Abstracts Contine (CAS)

nei	its are registered in Chemici	ai Abati acta Cci vii	CC	(Orto).		
	Composition	Proportion %	%	(by volume)	Exposure Limit	Toxicity Data
Α	Iron Oxide (magnetite)	3 - 15			No Data	No Data
В	Oil Soluble Dispersant	6 - 30			No Data	No Data
С	Light Hydrocarbon Oil	55 - 91			No Data	No Data

ISECTION 41: FIRST AID MEASURES

Necessary measures to be taken according to route(s) of exposure -

Ingestion: This material has minimal toxicity, but fluid aspirated into lungs during ingestion could cause severe pulmonary injury. Do not induce vomiting; seek medical attention if material is ingested.

Eve contact: Check for contact lenses and remove. Flush with water for at least 15 minutes and consult a physician for treatment.

Skin Contact: Wash with soap and water.

Inhalation of smoke or mist: Move to fresh air and refer to a physician for treatment. If difficulty in breathing is observed, supply oxygen. If inhaled, there are possibilities of dizziness or asphyxiation without special symptoms.

Most important symptoms/effects

Acute: Not established

Delayed: Not established

Indication of immediate medical attention and special treatment needed, if necessary: This product should not cause any significant health issues. Take appropriate action for signs of allergic or sensitivity reaction.

Notes to physicians: This product contains fatty acid dispersant and light paraffinic hydrocarbon oil. If breathing has stopped, try artificial respiration.

ISECTION 51: FIRE FIGHTING MEASURES

Suitable extinguishing media: CO2, Foam, dry chemical, water spray (water spray may cause frothing)

Unsuitable extinguishing media: N/A

Specific hazards arising from chemical combustion products: Burning may produce carbon monoxide and nitrogen oxides. Vapor mixed with air at temperatures above flash point may be explosive. Vapor is heavier than air.

Special protective equipment and precautions for fire-fighters: Respirators, if smoke or vapor is present.

ISECTION 61: ACCIDENTAL RELEASE MEASURES

Steps to be taken in case material is released or spilled

Personal precautions: Remove clothing that may have become contaminated, wash skin thoroughly with soap and lots of

Environmental Precautions: Remove free liquid. Add absorbent (sand, earth, sawdust) to spill area. After removing absorbent, wash surface with soap and water to reduce possible slipping hazard. If contamination of ground water is a concern, build a dike to contain spilled fluid, then clean as indicated. Prevent spilled fluid from entering sewers, water courses or low areas.

Methods and materials for containment and cleanup: Consult federal state and local regulations applicable to disposal of waste oil products.

ISECTION 71: HANDLING AND STORAGE

Precautions for safe handling: Ordinary care in handling chemicals. Wash hands after handling.

Conditions for safe storage: Keep in a cool, dark area. If large quantities are stored, ground the storage container to

Other precautions: Avoid contamination of food or tobacco products. Users should be aware that a very small percentage of the population may display unexpected allergic skin reactions to otherwise innocuous industrial chemicals and raw materials

ISECTION 81: EXPOSURE CONTROLS / PERSONAL PROTECTION

OSHA permissible exposure limit (PEL): Not established

ACGIH Threshold Limit Value (TLV): Not established

Any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the safety

data sheet, where available: No data

Appropriate engineering controls: Supply adequate ventilation

Personal Protective Measures/Equipment:

Respiratory protection: Not required unless smoke, mists or vapors are produced.

Ventilation: No special ventilation required.

Hand protection: Rubber or plastic gloves to prevent prolonged or repeated contact with skin.

Eve protection: Safety glasses recommended if splash is possible. Other protective equipment: Apron recommended but not required.

ISECTION 91: PHYSICAL AND CHEMICAL PROPERTIES

Lower /Upper Explosion Limits: Not established Appearance: Black/brown fluid

Odor: Mild. faint

Vapor Pressure (kPa @ 20oC): 0.1 Vapor Density (Air = 1): 6.4

Odor Threshold: Not established

Density: 1.21 - 1.42 g/cc

Water Solubility: Insoluble Melting/Freezing Point (oC): Not established

Boiling Point (oC): 223 Partition Coefficient: n-octanol/water: No data

Flash Point (oC): 81

Auto-ignition Temperature: 200oC

Evaporation Rate: < 0.1 Decomposition Temp.: No data

Flammability (solid/gas): No data Viscosity: 6 - <12 cP

SECTION 10]: STABILITY AND REACTIVITY

Reactivity: No data

Chemical stability: Stable under recommended storage conditions

Possibility of hazardous reactions: No data

Conditions to avoid (e.g. static discharge, shock or vibration): Will evaporate if left open to air. Avoid flame, spark and

other ignition sources. Keep away from sewers and bodies of water.

Incompatible materials: Strong oxidizing agents

Hazardous decomposition products: In the event of fire, see section 5.

[SECTION 11]: TOXICOLOGICAL INFORMATION

Acute Toxicity

Oral LD50

LD50 Oral - No data

Inhalation LC50

LC50 Inhalation - No data

Dermal LD50

LD50 Dermal - No data

Other information on acute toxicity

Skin corrosion/irritation: May cause skin irritation

Serious eve damage/eve irritation: May cause irritation to eyes and/or membranes

Respiratory or skin sensitization: May cause respiratory irritation

Germ cell mutagenicity: No data

Carciongenicity: No data

IARC: No data NTP: No data

OSHA: No data

Reproductive Toxicity: No data

Teratogenicity: No data

Specific target organ toxicity - single exposure (Globally Harmonized System): No data

Specific target organ toxicity - repeated exposure (Globally Harmonized System): No data Aspiration hazard: No data

Potential health effects

Inhalation: Slight irritation

Ingestion: May cause slight irritation if aspirated during swallowing

Skin: Slight irritation Eyes: Slight irritation