

FUJIFILM *MATERIAL SAFETY DATA SHEET***1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

MANUFACTURER : FUJIFILM Electronic Materials Co., Ltd.
15TH ARAI BLDG. 19-20, JINGUHMAE 6-CHOME,
SHIBUYA-KU, TOKYO, 150-0001 JAPAN
TEL 81-3-3406-6911 FAX 81-3-3498-0567

EMERGENCY CALL : 81-548-32-7005
FUJIFILM Electronic Materials Co., Ltd.
Shizuoka Factory

RevisionNo : 3
IssuedDate : May 27, 2009

ProductName : **FH-ER**
ChemicalFamily : Organic Mixture
Formula : Not Applicable/Mixture
UseDescription : Positive Photo resist

2. COMPONENT DATA

Chemical Name	Ethyl lactate (EL)	Methyl ethyl ketone (MEK)
CAS Number	97-64-3	78-93-3
Content Range	55-65%	35-45%
Hazardous Per 29 CFR 1910.1200	Yes	Yes

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW : Flammable liquid. This material has not been fully investigated.
Avoid inhaling vapor. Avoid contact with skin and eyes.

POTENTIAL HEALTH EFFECTS :

Inhalation : High vapor concentration may cause headache, drowsiness, dizziness, nausea, cough and irritation. Solvent can cause irritation.

Eye contact : May cause irritation.

Skin contact : Prolonged or repeated contact may cause drying, cracking or irritation.

Ingestion : Solvent is harmful if swallowed.

Chronic : No known effects.

OSHA Hazard Classification : Flammable Liquid;
Skin, eye and respiratory tract irritant.

4. FIRST AID

1. EYES : Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If eye irritation develops, call a physician at once.

2. SKIN : Immediately flush with water for at least 15 minutes. If the irritation develops, call a physician. If clothing comes in contact with the product, the clothing should be removed immediately and should be laundered before reuse.

3. INGESTION :

Immediately drink large quantities of water to dilute. Do not induce vomiting.

Call a physician at once. Do not give anything by mouth if the person is unconscious or if having convulsions.

4. INHALATION :

If person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Call a physician. In the event that an individual inhales enough vapors to lose consciousness, person should be moved to fresh air at once and a physician should be given immediately. If breathing has stopped, artificial respiration should be given immediately. In all cases ensure adequate ventilation and provide respiratory protection before the person returns to work.

5. FIRE AND EXPROSION HAZARD INFORMATION

1. Flammability data :

Flammable	:	Yes
Combustible	:	Yes
Pyrophoric	:	No
Flashpoint	:	4.5Deg.C Test Method
Auto ignition temperature	:	No data
Flammable limits (vol% in air)	:	LEL 1.5vol%, UEL 11.4vol% (EL) LEL 1.7vol%, UEL 11.4vol% (MEK)

2. Extinguishing media : Carbon dioxide, dry chemical, soda acid, regular form (alcohol resistant), water spray

3. Fire fighting techniques : Use water to cool containers exposed to fire.

6. ACCIDENTAL RELEASE MEASURES

GENERAL : Eliminate all ignition sources. Consult an expert on the disposal of recovered material. Ensure disposal is in compliance with government requirements and ensure conformity of local disposal regulations. Notify the appropriate authorities immediately. Take all additional action necessary to prevent and remedy the adverse effects of the spill.

LAND SPILL : Absorb it with commercially available absorbing materials.

7. HANDLING AND STORAGE

Do not take internally. Do not inhale mist or vapor. Avoid contact with skin, eyes, and clothing.

Upon contact with skin or eyes, wash off with water.

Storage conditions : Store in cool, preferably below 25 Deg. C (77 Deg. F) above 0 Deg. C (32 Deg. F), dry, well ventilated place, away from all source of ignition. Outside or detached storage is preferable. Inside storage should be in a standard flammable liquids storage room or cabinet. There is a possibility for the glass bottle of the resist to be broken under long time storage because of a rise of inner pressure caused by decomposition of components. The viscosity of this product may go to up under long time storage.

Do not subject to mechanical shock.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

ENGINEERING CONTROLS (VENTILATION) : Use local ventilation at places where vapor can be released into the workplace air. Keep vapor concentrations below the recommended TLV.

Chemical name	Source	Type	Exposure limits	Notes
Methyl ethyl ketone(MEK)	ACGIH	STEL	300 ppm	
	ACGIH	TWA	200 ppm	

PERSONAL PROTECTION

RESPIRATORY : Not required for occasional handling if adequate ventilation is available.
A respirator is recommended for prolonged handling or exposure.

PROTECTIVE GLOVES : Wear chemical resistant gloves.

EYE PROTECTION : Wear safety goggles or equivalent eye protection.

OTHER : Wear appropriate protective clothing to prevent skin contact.

WORK/HYGIENIC PRACTICES : Always clean protective equipment and workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Clear, colorless liquid	Odor	: Fruity ester odor
Freezing point	: No data	Solubility in water	: No data
Boiling point	: No data	Evaporation rate	: No data
Decomposition temperature	: No data	(Butyl Acetate=1)	
Specific gravity	: 0.9	Vapor density	: No data
Vapor pressure at 20 Deg. C	: No data	(Air=1)	
Coefficient of oil/water distribution	: No data	Molecular weight	: No data

10. STABILITY AND REACTIVITY

Stability : Stable in cool and dry area. Stable in intercepting light area.

Hazardous polymerization : Will not occur.

Conditions to avoid : Exposure to the light.

Incompatibility : Oxidizing materials.

Hazardous decomposition products : Carbon Dioxide Carbon Monoxide

11. TOXICOLOGICAL INFORMATION

1. Routes of absorption

Inhalation, ingestion, skin and eye contact.

2. Warning statement and warning properties

May cause skin, eye and respiratory irritation may be harmful.

If inhaled or ingested, do not take internally.

3. Human threshold response data

Odor threshold : No data

Irritation threshold : The irritation threshold has not been established for this product.

Immediately dangerous life or health : The IDLH concentration has not been established for this product.

4. Signs, Symptoms and Effects of exposure

Inhalation

Acute :

High vapor concentrations are irritating to the eyes and the respiratory tract and may cause headaches, dizziness, anesthesia and other effects of central nervous system depression.

Any irritation would be transient with no permanent damage expected.

Chronic :

No other effect would be expected except for those listed under acute inhalation exposure.

Skin

Acute :

Skin contact may cause irritation consisting of transient redness. This effect will not result in permanent damage.

Chronic :

No other effects expected except those listed under acute exposure. Prolonged exposure may result in drying and flaking of the skin due to its defeating properties.

Eye

Contact with the eyes would cause stinging and pain and irritation consisting of reversible redness, swelling and mucous discharge to the conjunctive.

5. Interactions with other chemicals which enhance toxicity

None known or reported.

6. Animal toxicology**Acute toxicology**

There is no data available for this product. Individual constituents are as follows ;

Chemical name	Test results
Ethyl lactate (EL)	Inhalation LC50 (8 hour (s),rat): >5400 mg/m ³ Oral LD50 (rat): >5000 mg/kg
Methyl ethyl ketone(MEK)	Dermal LD50 (rabit): 6480 mg/kg Inhalation LC50 (4hour (s),rat): 11700 ppm Oral LD50 (rat): 2737 mg/kg

Acute target organ toxicity

Irritation to skin and eyes. Central nervous system depression.

Chronic target organ toxicity

These are no known or reported effects from chronic exposure to this product.

Reproductive and developmental toxicity

This product is not known or reported to affect reproductive performance or fatal development.

Carcinogenicity

IARC : This product does not correspond to group 1- group 4

Mutagenicity

This product is not known or reported to be mutagenic.

Aquatic toxicity

There is no available data for this product.

12. ECOLOGICAL INFORMATION

Chemical name	Test results
EL	LC50 (48 hour(s),Saltwater - fish): 320 mg/l EC50 (48 hour(s),Daphnia): 683 mg/l EC50 (Daphnia): 2200 mg/l
Methyl ethyl ketone(MEK)	LC50 (Goldfish): >5000 mg/124hour LC50 (Daphnia): 8890 mg/124hour

13. DISPOSAL CONSIDERATIONS

To be incinerated by adequate method. Dispose in accordance with federal, state and local regulations.

The owner of the materials responsible for proper waste disposal.

14. TRANSPORTATION INFORMATION

This material is regulated as a DOT hazardous material.

Land : Methyl ethyl ketone, 3, UN1193, PGII

Water : Methyl ethyl ketone, 3, UN1193, PGII

Air : Methyl ethyl ketone, 3, UN1193, PGII

15. REGULATORY INFORMATION

No additional information.

16. ADDITIONAL INFORMATION

REVISION SUMMARY : Newly prepared.

REFERENCES :

- (1) ACGIH; Threshold Limit Values and Biological Exposure Indices for 1995-1996(1995)
- (2) OSHA; Federal Register, 54(No.12), 2332-2983
- (3) IPCS; International Chemical Safety Cards(Japanese), The Chemical Daily Co., Ltd.
- (4) ECETOC; The toxicology of Glycol Ethers and its Relevance to Man, Technical Report No.64(1995)

The information is believed to be accurate and represents the best information currently available to us.

However, no guarantee or warranty of any kind, expressed or implied, is made with respect to the information contained herein.