

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

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**FUJIFILM ELECTRONIC MATERIALS CO., LTD.**  
**Shizuoka Factory**

Revision No. : 1  
Issued Date : December 1 2004  
MSDS No. : PD-004E

**Product Name** : **FHD-5**

Chemical Family : Organic Salt  
Formula : Not Applicable/Mixture  
Use Description : Positive Resist Developer

**2. COMPONENT DATA**

Chemical Name	Tetramethylammonium hydroxide (TMAH)	Water
CAS Number	75-59-2	7732-18-5
Content Range	1.3-3.3%	>97.7%
Hazardous Per 29 CFR 1910.1200	No	No

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### **3. HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW** : Clear aqueous liquid. This material has not been fully Investigated. Avoid contact with skin, eyes and clothing.

**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** : This liquid is harmful if swallowed.

**Chronic** : No known effects.

**OSHA Hazard Classification** : Corrosive to eyes;  
Skin, eye and respiratory tract irritant.

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### **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.

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## **5. FIRE AND EXPROSION HAZARD INFORMATION**

### 1. Flammability data :

Flammable	:	No
Combustible	:	No
Pyrophoric	:	No
Flashpoint	:	Not flammable
Auto ignition temperature	:	Not applicable
Flammable limits (vol%inair)	:	LEL No data, UEL No data

2. Extinguishing media : Not applicable, choose extinguish media suitable for surrounding materials.

3. Fire fighting techniques : This product does not burn unless all the water is boiled away. The remaining organic compound may be ignitable. Use water to cool Containers exposed to fire.

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## **6. ACCIDENTAL RELEASE MEASURES**

**GENERAL** : 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.

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## **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.

Do not subject to mechanical shock.

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## **8. EXPOSURE CONTROLS AND PERSONAL PROTECTION**

**ENGINEERING CONTROLS(VENTILATION)** : Use local exhaust ventilation

**ACGIH TLV for TMAH** : Not established

**OSHA PEL for TMAH** : Not established

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**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.
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**9. PHYSICAL AND CHEMICAL PROPERTIES**

Appearance	: Clear, colorless liquid	Odor	: Amine odor
Freezing point	: No data	Solubility in water	: Complete
Boiling point	: 102Deg.C	Evaporation rate	: No data (Butyl Acetate=1)
Decomposition temperature	: No data	Vapor density	: No data (Air=1)
Specific gravity	: Approximately 1	Molecular weight	: No data
Vapor pressure at 20 Deg. C	: No data		
Coefficient of oil/water distribution	: No data		

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**10. STABILITY AND REACTIVITY**

- Stability** : Stable in cool and dry area.
- Hazardous polymerization** : Will not occur.
- Conditions to avoid** : Exposure above 40Deg.C(104Deg.F)
- Incompatibility** : Strong acid, strong oxidizers.
- Hazardous decomposition products** : See section 5.
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**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 available data for product.

Irritation threshold : No available data for 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 :

Inhalation of this material is irritating to the nose, mouth, throat and lungs. It may also cause burns to the respiratory tract which can result in shortness of breath, wheezing, choking, chest pain and impairment of lung function.

Chronic :

Chronic inhalation may cause impairment of lung function and permanent lung damage.

##### **Skin**

Acute :

Dermal exposure would be expected to cause mild irritation consisting of slight transient redness. This irritant effects from chronic exposure except for effects similar too those experienced from single exposure.

Chronic :

There are no known or reported effects from chronic exposure except for effects similar to those experienced from single exposure.

##### **Eye**

Severe irritation and or burns can occur following exposure. Contact may cause impairment of vision and corneal damage.

#### **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 ;

# TMAH	:	
Inhalation LC50	:	No data
Dermal LD50	:	>25mg/kg(guinea pig)
Oral LD50	:	No data
Irritation	:	Irritant to skin and eyes, mucous membranes.

##### **Acute target organ toxicity**

This product is corrosive to the eyes, a mild irritant to the skin and upon inhalation, may cause irritation to mucous membranes and respiratory tract.

##### **Chronic target organ toxicity**

These are no known or reported effects from repeated chronic exposure except those secondary to burns.

##### **Reproductive and developmental toxicity**

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

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**12. ECOLOGICAL INFORMATION**

1. Product : No data available.
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**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.

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**14. TRANSPORTATION INFORMATION**

This material is not regulated as a DOT hazardous material.

**Land** : Not applicable.

**Water** : Not applicable.

**Air** : Not applicable.

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**15. REGULATORY INFORMATION**

No additional information.

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**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.**