

## 1. Product and Company Identification

**Material name** CD-2060  
**Issue date** 04-07-2011  
**Revision date** -  
**Supersedes date** -  
**CAS #** Mixture  
**Product use** LCD resist developer.  
**Spec ID** 10000002222  
**Manufacturer**  
 FUJIFILM Electronic Materials U.S.A., Inc.  
 80 Circuit Road  
 North Kingstown RI 02852  
 Transportation Emergency:  
 FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC: 1-800-424-9300  
 Medical Emergency (24HR):  
 FOR ANY HEALTH & MEDICAL EMERGENCY, 24 HOURS /7 DAYS CALL:  
 1-800-365-8951  
 Non-emergency Telephone:  
 FOR ALL MSDS REQUESTS & QUESTIONS, CALL CUSTOMER SERVICE:  
 1-800-553-6546

**MSDS file** 12151\_NA\_EN\_V4.0  
**Replaces file** 12151\_NA\_EN\_V3.0

## 2. Hazards Identification

**Physical state** Liquid.  
**Appearance** Colorless liquid.  
**Emergency overview** WARNING! Causes skin, eye and respiratory tract irritation.  
**Potential health effects**  
**Routes of exposure** Eyes. Skin. Inhalation. Ingestion.  
**Eyes** Causes eye irritation.  
**Skin** Causes skin irritation.  
**Inhalation** Causes respiratory tract irritation.  
**Ingestion** May cause discomfort if swallowed.  
**Target organs** Eyes. Skin. Respiratory system.  
**Chronic effects** None known.  
**Signs and symptoms** Eye and skin contact: May cause redness and pain.  
**Potential environmental effects** The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

## 3. Composition / Information on Ingredients

| Components                    | CAS #    | Percent |
|-------------------------------|----------|---------|
| Diethanolamine                | 111-42-2 | 0.1-0.6 |
| Tetramethylammonium hydroxide | 75-59-2  | 0.0-0.4 |

**Composition comments** All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## 4. First Aid Measures

### First aid procedures

**Eye contact** Immediately flush with plenty of water for up to 15 minutes. Remove any contact lenses and open eyes wide apart. Get medical attention promptly if symptoms occur after washing.

**Skin contact** Remove contaminated clothes and rinse skin thoroughly with water for at least 15 minutes. Get medical attention promptly if symptoms persist or occur after washing.

**Inhalation** Move injured person into fresh air and keep person calm under observation. Get medical attention if any discomfort continues.

**Ingestion**

Rinse mouth thoroughly with water and give large amounts of milk or water to people not unconscious. Only induce vomiting at the instruction of medical personnel. Get medical attention if any discomfort continues.

**Notes to physician**

Treat symptomatically.

**5. Fire Fighting Measures****Flammable properties**

The product is non-combustible.

**Extinguishing media****Suitable extinguishing media**

Use fire-extinguishing media appropriate for surrounding materials.

**Unsuitable extinguishing media**

None.

**Protection of firefighters****Specific hazards arising from the chemical**

In case of fire, toxic and corrosive gases may be formed.

**Protective equipment and precautions for firefighters**

Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace. Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

**Fire fighting equipment/instructions**

Use standard firefighting procedures and consider the hazards of other involved materials.

**Hazardous combustion products**

Carbon monoxide. Nitrogen oxides.

**6. Accidental Release Measures****Personal precautions**

Avoid inhalation of vapors/spray and contact with skin and eyes. Wear suitable protective clothing. See Section 8 of the MSDS for Personal Protective Equipment.

**Environmental precautions**

Avoid discharge into drains, water courses or onto the ground unless authorized by permit.

**Methods for cleaning up**

Absorb spillage with suitable absorbent material. For waste disposal, see section 13 of the MSDS.

**7. Handling and Storage****Handling**

Local exhaust is recommended. Avoid inhalation of vapors and spray mist and contact with skin and eyes. Wear approved safety goggles. Wear protective gloves and appropriate clothing to prevent skin contact. Observe good industrial hygiene practices.

**Storage**

Store above freezing. Store in closed original container in a dry place. Store away from incompatible materials.

**8. Exposure Controls / Personal Protection****Occupational exposure limits****US. ACGIH Threshold Limit Values**

| Components                | Type | Value               | Form                          |
|---------------------------|------|---------------------|-------------------------------|
| Diethanolamine (111-42-2) | TWA  | 1 mg/m <sup>3</sup> | Inhalable fraction and vapor. |

**Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)**

| Components                | Type | Value               |
|---------------------------|------|---------------------|
| Diethanolamine (111-42-2) | TWA  | 2 mg/m <sup>3</sup> |

**Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)**

| Components                | Type | Value               | Form                          |
|---------------------------|------|---------------------|-------------------------------|
| Diethanolamine (111-42-2) | TWA  | 1 mg/m <sup>3</sup> | Vapor and aerosol, inhalable. |

**Canada. Ontario OELs. (Ministry of Labor - Control of Exposure to Biological or Chemical Agents)**

| Components                | Type | Value               |
|---------------------------|------|---------------------|
| Diethanolamine (111-42-2) | TWA  | 2 mg/m <sup>3</sup> |

**Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)**

| Components                | Type | Value                         |
|---------------------------|------|-------------------------------|
| Diethanolamine (111-42-2) | TWA  | 3 ppm<br>13 mg/m <sup>3</sup> |

**Engineering controls**

Provide adequate ventilation. Observe Occupational Exposure Limits and minimize the risk of inhalation of vapors.

**Personal protective equipment**

|                                       |  |
|---------------------------------------|--|
| <b>Eye / face protection</b>          | Wear approved safety goggles.  |
| <b>Skin protection</b>                | Wear protective gloves. Be aware that the liquid may penetrate the gloves. Frequent change is advisable. Suitable gloves can be recommended by the glove supplier. Wear appropriate chemical resistant clothing to prevent any possibility of skin contact.  |
| <b>Respiratory protection</b>         | If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134. Use a NIOSH/MSHA approved air purifying respirator as needed to control exposure. Consult with respirator manufacturer to determine respirator selection, use, and limitations. Use positive pressure, air-supplied respirator for uncontrolled releases or when air purifying respirator limitations may be exceeded. Follow respirator protection program requirements (OSHA 1910.134 and ANSI Z88.2) for all respirator use. |
| <b>General hygiene considerations</b> | Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.  |

**9. Physical & Chemical Properties****Information on basic physical and chemical properties**

|  |   |
|--|---|
| <b>Appearance</b>  | Colorless liquid.                             |
| <b>Physical state</b>  | Liquid.                                       |
| <b>Form</b>  | Liquid.                                       |
| <b>Color</b>   | Colorless.                                    |
| <b>Odor</b>  | Mild ammonia.                                 |
| <b>Odor threshold</b>  | Not available.                                |
| <b>pH</b>  | 11 - 13 (25°C)                                |
| <b>Melting point/freezing point</b>                            | 23 - 32 °F (-5 - °C)                          |
| <b>Boiling point, initial boiling point, and boiling range</b> | No data available.                            |
| <b>Flash point</b>   | Not applicable.                               |
| <b>Auto-ignition temperature</b>                               | Not applicable.                               |
| <b>Flammability (solid, gas)</b>                               | Not available.                                |
| <b>Flammability limit - lower (%)</b>                          | Not applicable.                               |
| <b>Flammability limit - upper (%)</b>                          | Not applicable.                               |
| <b>Oxidizing properties</b>                                    | Not applicable.                               |
| <b>Explosive properties</b>                                    | Not applicable.                               |
| <b>Explosive limit</b>   | Not applicable.                               |
| <b>Vapor pressure</b>  | 15 mmHg (25°C)                                |
| <b>Vapor density</b>   | 1.3 (Air = 1)                                 |
| <b>Evaporation rate</b>  | < .05 (n-Butyl acetate = 1)                   |
| <b>Relative density (= specific gravity)</b>                   | 1   |
| <b>Density</b>   | 1 g/cc  |
| <b>Solubility (water)</b>                                      | Completely miscible.                          |
| <b>Partition coefficient (n-octanol/water)</b>                 | Not available.                                |
| <b>Decomposition temperature</b>                               | No data available.                            |
| <b>Viscosity</b>   | No data available.                            |
| <b>Volatiles, % by vol</b>                                     | 95 - 98                                       |
| <b>Other data</b>  |   |
| <b>Molecular weight</b>  | Not Applicable/Mixture                        |
| <b>Other information</b>                                       | No relevant additional information available. |

**10. Chemical Stability & Reactivity Information**

|                           |   |
|---------------------------|---|
| <b>Chemical stability</b> | Stable under normal temperature conditions. |
|---------------------------|---|

|   |   |
|---|---|
| <b>Conditions to avoid</b>                | Excessive heat. Freezing.                           |
| <b>Incompatible materials</b>             | Strong oxidizing agents. Strong acids.              |
| <b>Hazardous decomposition products</b>   | At elevated temperatures: Methanol. Trimethylamine. |
| <b>Possibility of hazardous reactions</b> | Will not occur.                                     |

## 11. Toxicological Information

### Toxicological data

| Components                              | Test Results  |
|---|---|
| Diethanolamine (111-42-2)               | Acute Dermal LD50 Rat: 2,200 mg/kg<br>Acute Oral LD50 Rat: 710 mg/kg  |
| Tetramethylammonium hydroxide (75-59-2) | Acute Dermal LD50 Rat: 112 mg/kg<br>Acute Oral LD50 Rat: 34 - 50 mg/kg  |
| <b>Acute effects</b>                    | May cause discomfort if swallowed.  |
| <b>Local effects</b>                    | Causes skin, eye and respiratory tract irritation.  |
| <b>Sensitization</b>                    | Not a skin sensitizer.  |
| <b>Chronic effects</b>                  | Diethanolamine: May cause damage to liver and kidney.   |
| <b>Carcinogenicity</b>                  | Not expected to cause cancer.   |
| <b>Mutagenicity</b>                     | No data available.  |
| <b>Reproductive effects</b>             | No data available.  |
| <b>Symptoms and target organs</b>       | Eye and skin contact: May cause redness and pain.   |
| <b>Further information</b>              | Tetramethylammonium hydroxide: May be fatal if swallowed or absorbed through skin. Causes severe skin and eye burns. Causes respiratory tract irritation.<br>Diethanolamine: Causes eye burns. Causes skin irritation. May cause respiratory tract irritation. May be harmful if swallowed. |

## 12. Ecological Information

### Ecotoxicological data

| Components                                     | Test Results  |
|--|---|
| Diethanolamine (111-42-2)                      | LC50 Daphnia: 180 mg/l<br>LC50 Fathead minnow (Pimephales promelas): 1,370 mg/l 96 Hours<br>LC50 Goldfish (Carassius auratus): 1,430 - 1,850 mg/l |
| Tetramethylammonium hydroxide (75-59-2)        | LC50 Daphnia: 55.6 mg/l 48 Hours  |
| <b>Ecotoxicity</b>                             | The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.  |
| <b>Persistence and degradability</b>           | No data available.  |
| <b>Bioaccumulation / Accumulation</b>          | No data available.  |
| <b>Partition coefficient (n-octanol/water)</b> | Not available.  |
| <b>Mobility in environmental media</b>         | The product is miscible with water. May spread in water systems.  |

## 13. Disposal Considerations

|  |  |
|--|--|
| <b>Waste codes</b>                           | D002: Waste Corrosive material [pH <=2 or >=12.5, or corrosive to steel]   |
| <b>Disposal instructions</b>                 | Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal. |
| <b>Waste from residues / unused products</b> | Dispose of in accordance with local regulations.   |
| <b>Contaminated packaging</b>                | Empty containers should be taken to an approved waste handling site for recycling or disposal.   |

## 14. Transport Information

### DOT

Not regulated as dangerous goods.

**IATA**

Not regulated as dangerous goods.

**IMDG**

Not regulated as dangerous goods.

**TDG**

Not regulated as dangerous goods.

**15. Regulatory Information****US federal regulations**

This product is hazardous according to OSHA 29 CFR 1910.1200.  
 TSCA Section 4(a) Final Test Rules & Testing Consent Orders: Not regulated.  
 TSCA Section 5(e) PMN-Substance Consent Orders: Not regulated.

**Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number**

Not listed.

**TSCA Section 5(a)(2) Final Significant New Use Rules (SNURs)(40CFR 721, Subpt. E)**

Not regulated.

**TSCA Section 12(b) Export Notification(40 CFR 707, Subpt. D)**

Not regulated.

**US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration**

Diethanolamine (CAS 111-42-2) 1.0 %

**US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance**

Diethanolamine (CAS 111-42-2) Listed.

**CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)**

Diethanolamine: 100

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories**  
 Immediate Hazard - Yes  
 Delayed Hazard - No  
 Fire Hazard - No  
 Pressure Hazard - No  
 Reactivity Hazard - No

**Section 302 extremely hazardous substance (40 CFR 355, Appendix A)**  
 No

**Section 311/312 (40 CFR 370)**  
 Yes

**Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)**  
 Not controlled

**Canadian regulations**  
 This product has been classified according to the hazard criteria of the Canadian Controlled Products Regulations, Section 33, and the MSDS contains all required information.

**WHMIS status**  
 Controlled

**WHMIS classification**  
 D2B - Other Toxic Effects-TOXIC

**WHMIS labeling****Inventory status**

| Country(s) or region        | Inventory name  | On inventory (yes/no)* |
|-----------------------------|---|------------------------|
| Australia                   | Australian Inventory of Chemical Substances (AICS)                | Yes                    |
| Canada                      | Domestic Substances List (DSL)                                    | Yes                    |
| Canada                      | Non-Domestic Substances List (NDSL)                               | No                     |
| New Zealand                 | New Zealand Inventory   | Yes                    |
| Philippines                 | Philippine Inventory of Chemicals and Chemical Substances (PICCS) | Yes                    |
| United States & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory                     | Yes                    |

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)  
 All ingredients are TSCA compliant.

**State regulations**  
 This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

**US - Massachusetts RTK - Substance: Listed substance**

Diethanolamine (CAS 111-42-2) Listed.

**US - Minnesota Haz Subs: Listed substance**

Diethanolamine (CAS 111-42-2) Listed.

**US - New Jersey Community RTK (EHS Survey): Reportable threshold**

Diethanolamine (CAS 111-42-2) 500 LBS

**US - New Jersey RTK - Substances: Listed substance**

Diethanolamine (CAS 111-42-2) Listed.

Tetramethylammonium hydroxide (CAS 75-59-2) Listed.

**US - Pennsylvania RTK - Hazardous Substances: Listed substance**

Diethanolamine (CAS 111-42-2) Listed.

**US - Rhode Island RTK - Hazardous Substances: Listed substance**

Diethanolamine (CAS 111-42-2) Listed.

**Mexico regulations** This product is dangerous according to Mexican regulations.**16. Other Information****Further information** HMIS® is a registered trade and service mark of the NPCA. C - Safety Glasses, Gloves, Apron**HMIS® ratings**  
Health: 2  
Flammability: 0  
Physical hazard: 0  
Personal protection: C**NFPA ratings**  
Health: 2  
Flammability: 0  
Instability: 0**Disclaimer**  
THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200 AND THE CANADIAN CONTROLLED PRODUCT REGULATION (SOR/88-66). THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. FUJIFILM ELECTRONIC MATERIALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT FUJIFILM ELECTRONIC MATERIALS AT THE PHONE NUMBER 1-800-553-6546 (CUSTOMER SERVICE) TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.**Issue date** 04-07-2011**MSDS file** 12151\_NA\_EN\_V4.0**Replaces file** 12151\_NA\_EN\_V3.0