AZ 726 MIF Developer

**SECTION 1. IDENTIFICATION**

**Product identifier**
- **Product name**: AZ 726 MIF Developer
- **Product number**: 184448

**Recommended use of the chemical and restrictions on use**
- **Recommended use**: Intermediate for electronic industry

**Details of the supplier of the safety data sheet**
- **Company**: EMD Performance Materials Corp., an Affiliate of Merck KGaA, Darmstadt, Germany, 1200 Intrepid Avenue, Suite 300, Philadelphia, PA 19112, 1-888-367-3275, www.emd-pm.com
- **Emergency telephone**: 1-800-424-9300 CHEMTREC (USA)
  1-703-741-5970 CHEMTREC (International)
  24 Hours/day; 7 Days/week

**SECTION 2. HAZARDS IDENTIFICATION**

**GHS Classification**
- **Corrosive to Metals**: Category 1
- **Acute toxicity (Oral)**: Category 4
- **Acute toxicity (Dermal)**: Category 3
- **Skin corrosion**: Category 1C
- **Serious eye damage**: Category 1
- **Specific target organ toxicity - single exposure**: Category 1 (Central nervous system)
- **Specific target organ toxicity - repeated exposure**: Category 1 (Liver, thymus gland)

**GHS label elements**
AZ 726 MIF Developer

Hazard pictograms:

- Skull and crossbones
- Exclamation mark
- Eye symbol

Signal Word: Danger

Hazard Statements:
- H290 May be corrosive to metals.
- H302 Harmful if swallowed.
- H311 Toxic in contact with skin.
- H314 Causes severe skin burns and eye damage.
- H370 Causes damage to organs (Central nervous system).
- H372 Causes damage to organs (Liver, thymus gland) through prolonged or repeated exposure.

Precautionary Statements:

**Prevention:**
- P234 Keep only in original container.
- P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response:**
- P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
- P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
- P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
- P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
- P307 + P311 IF exposed: Call a POISON CENTER or doctor/physician.
- P362 Take off contaminated clothing and wash before reuse.
- P390 Absorb spillage to prevent material damage.

**Storage:**
- P405 Store locked up.
- P406 Store in corrosive resistant container with a resistant inner liner.

**Disposal:**
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Concentration (% w/w)</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetramethylammonium hydroxide</td>
<td>&gt;= 1 - &lt; 5</td>
<td>75-59-2</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

General advice : First aider needs to protect himself. TMAH is a severe Neurotoxin causing Ganglion Blockage. Rapid and vigorous decontamination followed by prompt medical respiratory support is needed for anyone that has experienced significant exposure. While the extent of the effects depend upon the exposure concentration, exposure duration and body area contacted; failure to provide prompt medical intervention in cases of significant exposure may result in fatality.

If inhaled : fresh air. Call in physician. Consult a physician. If breathed in, move person into fresh air. If breathing has stopped, apply artificial respiration.

In case of skin contact : Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact : Rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses. Continue rinsing eyes during transport to hospital. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

If swallowed : make victim drink water (two glasses at most), avoid vomiting (risk of perforation!). Call a physician immediately. Do not attempt to neutralize.
Do NOT induce vomiting. Never give anything by mouth to an unconscious person.

**Most important symptoms and effects, both acute and delayed:**
- Irritation and corrosion
- Cough
- Shortness of breath
- Risk of blindness!

**Notes to physician:**
- No information available.

### SECTION 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media:**
- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable extinguishing media:**
- For this substance/mixture no limitations of extinguishing agents are given.

**Specific hazards during fire fighting:**
- Not combustible.

- May release toxic, irritating and/or corrosive gases.

**Further information:**
- Suppress (knock down) gases/vapors/mists with a water spray jet.
- Avoid breathing vapors and keep upwind.

**Special protective equipment for fire-fighters:**
- Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.
- Well closed full protective clothing (coat and pants) including helmet.

### SECTION 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures:**
- Advice for non-emergency personnel:
  - Do not breathe vapors, aerosols.
  - Avoid inhalation of vapors/aerosols or dusts.
  - Avoid substance contact.
  - Ensure adequate ventilation.
  - Evacuate the danger area, observe emergency procedures, consult an expert.
- Advice for emergency responders:
  - Protective equipment see section 8.
- Indications about waste treatment see section 13.
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Revision Date: 07.08.2019
SDS Number: 70MDGM184448

Environmental precautions: No special precautionary measures necessary.

Methods and materials for containment and cleaning up: Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling
Advice on safe handling: Avoid inhalation, ingestion and contact with skin and eyes. Wash thoroughly after handling. Observe label precautions.

Conditions for safe storage, including any incompatibilities
Conditions for safe storage: No metal containers. Store in original container.

Storage conditions: Keep container tightly closed in a dry and well-ventilated place.

Keep locked up or in an area accessible only to qualified or authorized persons.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Contains no substances with occupational exposure limit values.

Hazardous components without workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetramethylammonium hydroxide</td>
<td>75-59-2</td>
</tr>
</tbody>
</table>

Engineering measures: Handle only in a place equipped with local exhaust (or other appropriate exhaust). Ensure that eye flushing systems and safety showers are located close to the working place. Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Personal protective equipment

Respiratory protection: Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided
by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection. Required when vapors/aerosols are generated.

Eye protection: Tightly fitting safety goggles
Safety glasses with side-shields conforming to EN166

Hygiene measures: Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. Keep away from food and drink.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>liquid</td>
</tr>
<tr>
<td>Form</td>
<td>liquid</td>
</tr>
<tr>
<td>Color</td>
<td>clear colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>odorless</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not applicable</td>
</tr>
<tr>
<td>pH</td>
<td>No information available.</td>
</tr>
<tr>
<td>Freezing point</td>
<td>ca. 0 °C</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>ca. 212 °F (100 °C) at 1,013 hPa</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No information available.</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No information available.</td>
</tr>
<tr>
<td>Lower explosion limit</td>
<td>No information available.</td>
</tr>
<tr>
<td>Upper explosion limit</td>
<td>No information available.</td>
</tr>
</tbody>
</table>
Vapor pressure: No information available.

Relative vapor density: No data available

Density: ca. 1 g/cm³
at 68 °F (20 °C)

Relative density: No information available.

Water solubility: miscible in all proportions

Partition coefficient: n-octanol/water: No information available.

Autoignition temperature: Not applicable

Decomposition temperature: No information available.

Viscosity, dynamic: No information available.

Explosive properties: Not classified as explosive.

Oxidizing properties: none

Ignition temperature: Not applicable

Corrosion: Corrosive to metals

SECTION 10. STABILITY AND REACTIVITY

Reactivity: See below

Chemical stability: The product is chemically stable under standard ambient conditions (room temperature).

Possibility of hazardous reactions: The generally known reaction partners of water.

Conditions to avoid: Protect from frost, heat and sunlight.

Incompatible materials: Metals
Strong acids and oxidizing agents

Hazardous decomposition products: in the event of fire: See section 5.
SECTION 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Product
Carcinogenicity
IARC
No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA
No component of this product present at levels greater than or equal to 0.1% is on OSHA’s list of regulated carcinogens.

NTP
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Likely route of exposure
Eye contact, Skin contact

Acute oral toxicity
Acute toxicity estimate: 315.13 mg/kg
Calculation method

Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

Acute inhalation toxicity

Symptoms: Cough, Shortness of breath, Possible damages: damage of respiratory tract

Acute dermal toxicity
Acute toxicity estimate: 546.22 mg/kg
Calculation method

Skin irritation
Result: Corrosive, category 1C - where responses occur after exposures between 1 hour and 4 hours and observations up to 14 days.

Eye irritation
Mixture causes serious eye damage. Risk of blindness!

Experience with human exposure
Other Relevant Toxicity Information:
No toxicological testing was carried out on the preparation.
Other dangerous properties can not be excluded., Handle in accordance with good industrial hygiene and safety practice.

Components

*Tetramethylammonium hydroxide (75-59-2):*

*Acute oral toxicity*
LD50 Rat: 7.5 mg/kg
OECD Test Guideline 423 (ECHA)

*Acute dermal toxicity*
LD50 Rat: 13 mg/kg (ECHA) Based on human experience.

*Skin irritation*
Result: Causes burns.
(ECHA)

*Eye irritation*
Result: Irreversible effects on the eye
(ECHA)

*Repeated dose toxicity*
Rat
female
Dermal
28 d
daily
NOAEL: 2.5 mg/kg
Local effects, (ECHA)

Rat
male and female
Dermal
28 d
daily
NOAEL: 10 mg/kg
Systemic effects, (ECHA)

Rat
male
Oral
28 d
NOAEL: 5 mg/kg
OECD Test Guideline 407
(ECHA)

*Germ cell mutagenicity*
*Genotoxicity in vitro*
Ames test
Result: negative
Method: Mutagenicity (Escherichia coli - reverse mutation assay)
(ECHA)
Chromosome aberration test in vitro
Chinese hamster lung cells
Result: negative
Method: OECD Test Guideline 473 (ECHA)
STOT-single exposure
Target Organs: Central nervous system
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 1.
Remarks: (ECHA)

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity
Product

Persistence and degradability
No information available.

Bioaccumulative potential
No information available.

Mobility in soil
No information available.

Additional ecological information
No ecological testing was carried out on the preparation.
No ecological problems are to be expected when the product is handled and used with due care and attention.

Components

Tetramethylammonium hydroxide (75-59-2):

Toxicity to fish
LC50 Pimephales promelas (fathead minnow): > 100 mg/l; 96 h
OECD Test Guideline 203 (ECHA) (in analogy to similar compounds)

Toxicity to daphnia and other aquatic invertebrates
EC50 Daphnia magna (Water flea): 3 mg/l; 48 h
OECD Test Guideline 202 (ECHA)

Toxicity to algae
EC50 Pseudokirchneriella subcapitata (green algae): 96.3 mg/l; 72 h
OECD Test Guideline 201 (ECHA)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)
NOEC Daphnia magna (Water flea): 0.025 mg/l; 48 h
OECD Test Guideline 202 (ECHA)
**Biodegradability**
100 %; 28 d
OECD Test Guideline 301B
(ECHA)
Readily biodegradable.

*Partition coefficient: n-octanol/water*
log Pow: -1.4 (20 °C)
OECD Test Guideline 107
Bioaccumulation is not expected.

*Bioaccumulation*
(Bioaccumulation is unlikely.)

### SECTION 13. DISPOSAL CONSIDERATIONS

**Product Waste**: Waste material must be disposed of in accordance with national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

**RCRA number**: RCRA number: D002
Yes -- If it becomes a waste as sold.

### SECTION 14. TRANSPORT INFORMATION

**DOT / 49CFR**
- **UN/ID/NA number**: UN 1835
- **Proper shipping name**: Tetramethylammonium hydroxide solution

<table>
<thead>
<tr>
<th>Class</th>
<th>Packing group</th>
<th>Labels</th>
<th>ERG Code</th>
<th>Marine pollutant</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>III</td>
<td>Class 8 - Corrosive substances</td>
<td>153</td>
<td>no</td>
<td>LTD QTY &lt;= 5 L or 5 KG net capacity, as per 49 CFR 173.154</td>
</tr>
</tbody>
</table>

**International Regulations**

**IATA-DGR**
- **UN/ID No.**: UN 1835
- **Proper shipping name**: Tetramethylammonium hydroxide, solution
- **Class**: 8
- **Packing group**: III
- **Labels**: Class 8 - Corrosive substances
- **Packing instruction (cargo)**: 856
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Packing instruction (passenger aircraft): 852

IMDG-Code
- UN number: UN 1835
- Proper shipping name: TETRAMETHYLAMMONIUM HYDROXIDE SOLUTION

Class: 8
Packing group: III
Labels: 8
EmS Code: F-A, S-B
Marine pollutant: no
Remarks: Ammonium compounds, Alkalis

Special precautions for user
Not applicable

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know

CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 302
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act
This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC’s (40 CFR 60.489).

Clean Water Act
This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

**US State Regulations**

**Massachusetts Right To Know**
No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know**
Tetramethylammonium hydroxide 75-59-2

**New Jersey Right To Know**
Tetramethylammonium hydroxide 75-59-2

**California Prop. 65**
This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

The ingredients of this product are reported in the following inventories:

- **DSL**: All components of this product are on the Canadian DSL
- **TSCA**: All substances listed on the TSCA Active Inventory.

**SECTION 16. OTHER INFORMATION**

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.