AZ 300 MIF Developer

Version	Revision Date:	SDS Number:
5.3	01.07.2024	70MDGM184411

SECTION 1. IDENTIFICATION

Product identifier

: AZ 300 MIF Developer

Product number : 184411

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, an Affiliate of Merck KGaA, Darmstadt, Germany, 1200 Intrepid Avenue, Suite 300, Philadelphia, PA 19112, 1-888-367-3275, www.emdgroup.com/electronics

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

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Hazard pictograms :

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

Chemical name	Concentration (% w/w)	CAS-No.
Tetramethylammonium hydroxide	>= 1 - < 5	75-59-2

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. Immediately call in physician.
Consult a physician.
If breathed in, move person into fresh air.
If breathing has stopped, apply artificial respiration.
If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

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 : Product is compatible with standard fire-fighting agents.
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.

Ambient fire may liberate hazardous vapors.
May release toxic, irritating and/or corrosive gases.

Further information : Suppress (knock down) gases/vapors/mists with a water spray jet.
Prevent fire extinguishing water from contaminating surface water or the ground water system.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
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.

Environmental precautions : Do not flush into surface water or sanitary sewer system.

Methods and materials for containment and cleaning up	:	Cover drains. Collect, bind, and pump off spills. 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	:	Provide sufficient air exchange and/or exhaust in work rooms. Do not inhale substance/mixture. Avoid generation of vapors/aerosols. Avoid inhalation, ingestion and contact with skin and eyes. Observe label precautions.

Conditions for safe storage, including any incompatibilities

Conditions for safe storage	:	No metal containers.
Storage conditions	:	Risks from decomposition products: see section 10 Tightly closed. Keep in a 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

Components	CAS-No.
Tetramethylammonium hydroxide	75-59-2

Engineering measures	:	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. See section 7.

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.

Hand protection
Additional Protection : Chemically resistant gloves
Additional Protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products.

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.
Avoid contact with skin, eyes and clothing.
Wash hands and face before breaks and immediately after handling the product.
Keep away from food and drink.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Form	liquid
Color	colorless
Odor	slight characteristic
Odor Threshold	No information available.
pH	ca. 13 at 68 °F (20 °C)
Melting point	No information available.
Boiling point/boiling range	ca. 212 °F (100 °C) at 1,013 hPa
Flash point	Not applicable
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	Not applicable

Upper explosion limit	Not applicable
Vapor pressure	ca.23 mbar at 68 °F (20 °C)
Relative vapor density	No information available.
Density	ca.1 g/cm3 at 68 °F (20 °C)
Relative density	No information available.
Water solubility	soluble
Partition coefficient: n-octanol/water	No information available.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	ca.1 mPas at 68 °F (20 °C)
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. Violent reactions possible with:
Conditions to avoid	:	no information available
Incompatible materials	:	Metals
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
Inhalation, Eye contact, Skin contact

Acute oral toxicity
Acute toxicity estimate: 315.03 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
LD50 Rat: 449 mg/kg
OECD Test Guideline 402
(in analogy to similar compounds)

Skin irritation
Rabbit
Result: Corrosive, category 1C - where responses occur after exposures between 1 hour and 4 hours and observations up to 14 days.
OECD Test Guideline 404
(ECHA)

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

Experience with human exposure
Other Relevant Toxicity Information:
Causes burns., Harmful if swallowed.

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

Toxicity to daphnia and other aquatic invertebrates
EC50 Daphnia magna (Water flea): 12 mg/l; 48 h
OECD Test Guideline 202 (in analogy to similar compounds)

Toxicity to algae
EC50 Desmodesmus subspicatus (green algae): > 1,000 mg/l; 72 h
OECD Test Guideline 201 (in analogy to similar compounds)

Persistence and degradability
No information available.

Bioaccumulative potential
No information available.

Mobility in soil
No information available.

Additional ecological information
Discharge into the environment must be avoided.

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.

SECTION 14. TRANSPORT INFORMATION

DOT / 49CFR

UN/ID/NA number	:	1835
Proper shipping name	:	Tetramethylammonium hydroxide solution
Class	:	8
Packing group	:	III
Labels	:	CORROSIVE
ERG Code	:	153
Marine pollutant	:	no
Remarks	:	LTD QTY =< 5 L or 5 KG net capacity, as per 49 CFR 173.154

International Regulations

IATA-DGR

UN/ID No.	:	UN 1835
Proper shipping name	:	Tetramethylammonium hydroxide, solution
Class	:	8
Packing group	:	III
Labels	:	Corrosive
Packing instruction (cargo aircraft)	:	856

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.

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:

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

SECTION 16. OTHER INFORMATION

The information provided in this 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.