SAFETY DATA SHEET

AZ® 1512 Photoresist

Version 1.3
Revision Date: 24.10.2019
SDS Number: 70MDGM186135

SECTION 1. IDENTIFICATION

Product identifier
Product name : AZ® 1512 Photoresist

Product number : 186135

Recommended use of the chemical and restrictions on use
Recommended use : Materials for use in technical applications
                   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,

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
Flammable liquids : Category 3

Specific target organ toxicity - single exposure
                   : Category 3 (Central nervous system)

GHS label elements
Hazard pictograms : ♂️ ⚠️

Signal Word : Warning
AZ® 1512 Photoresist

Hazard Statements: H226 Flammable liquid and vapor. H336 May cause drowsiness or dizziness.

Precautionary Statements:
- Prevention:
  - P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
  - P233 Keep container tightly closed.
  - P240 Ground/bond container and receiving equipment.
  - P241 Use explosion-proof electrical/ventilating/lighting/equipment.
  - P242 Use only non-sparking tools.
  - P243 Take precautionary measures against static discharge.
  - P261 Avoid breathing dust/fume/gas/mist/vapors/spray.
  - P271 Use only outdoors or in a well-ventilated area.
  - P280 Wear protective gloves/eye protection/face protection.
- Response:
  - P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  - P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
  - P370 + P378 In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide to extinguish.
- Storage:
  - P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
  - P403 + P235 Store in a well-ventilated place. Keep cool.
  - P405 Store locked up.
- Disposal:
  - P501 Dispose of contents/container to an approved waste disposal plant.

Other hazards
None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance / Mixture</th>
<th>Mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical nature</td>
<td>Photoresist</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Concentration (% w/w)</th>
<th>CAS-No.</th>
</tr>
</thead>
</table>
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SECTION 4. FIRST AID MEASURES

If inhaled : Fresh air.

In case of skin contact : rinse out with polyethylene glycol 400 or a mixture of polyethylene glycol 300/ethanol 2:1 and wash with plenty of water. If neither is available wash with plenty of water. Immediately take off contaminated clothing. Seek medical advice immediately.

In case of eye contact : Rinse out with plenty of water.
Remove contact lenses.

If swallowed : Make victim drink water (two glasses at most). Consult doctor if feeling unwell.

Most important symptoms and effects, both acute and delayed : We have no description of any toxic symptoms.

Notes to physician : No information available.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Water
Foam
Carbon dioxide (CO2)
Dry powder

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

Specific hazards during fire fighting : Combustible.

Vapors are heavier than air and may spread along floors. Development of hazardous combustion gases or vapors possible in the event of fire.

Further information : 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.
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Special protective equipment for fire-fighters:
In the event of fire, wear self-contained breathing apparatus. 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. 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 with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling:
Advice on protection against fire and explosion:
Do not pressurise, cut, weld, braze, solder, drill, or grind on containers.

Advice on safe handling:
Keep away from fire (No Smoking). Observe label precautions.

Conditions for safe storage, including any incompatibilities:
Conditions for safe storage:
Store in original container. Keep tightly closed in a dry, cool and well-ventilated place.

Storage conditions:
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.
Risks from decomposition products: see section 10

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type</th>
<th>Control</th>
<th>Basis</th>
</tr>
</thead>
</table>
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Hazardous components without workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diazonaphthoquinonesulfonic</td>
<td>6782900000</td>
</tr>
<tr>
<td>ester</td>
<td>4-7792P</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.
- See section 7.

Personal protective equipment
- Respiratory protection: Not required; except in case of aerosol formation.
- Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Protective measures: Do not breathe dust/ fume/ gas/ mist/ vapor/ spray. Avoid contact with the skin and the eyes.
- Eye protection: Safety glasses
- Body Protection: Protective clothing
- Hygiene measures: 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: solution
Form: liquid
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<table>
<thead>
<tr>
<th>Property</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>red</td>
</tr>
<tr>
<td>Odor</td>
<td>characteristic pungent</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available.</td>
</tr>
<tr>
<td>pH</td>
<td>No information available.</td>
</tr>
<tr>
<td>Melting point</td>
<td>No information available.</td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>293 °F (145 °C)</td>
</tr>
<tr>
<td>Flash point</td>
<td>approximately 108 °F (42 °C)</td>
</tr>
<tr>
<td></td>
<td>Method: DIN 51755 Part: 1</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>
<tr>
<td>Vapor pressure</td>
<td>3.2 Torr</td>
</tr>
<tr>
<td></td>
<td>at 68 °F (20 °C)</td>
</tr>
<tr>
<td></td>
<td>Method: (calculated)</td>
</tr>
<tr>
<td>Relative vapor density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Density</td>
<td>ca.1.038 g/cm³</td>
</tr>
<tr>
<td></td>
<td>at 77 °F (25 °C)</td>
</tr>
<tr>
<td>Relative density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Water solubility</td>
<td>partly soluble - phase separation</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No information available.</td>
</tr>
</tbody>
</table>
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Autoignition temperature
No information available.

Decomposition temperature
No information available.

Viscosity, dynamic
approximately 35 mPas
at 68 °F (20 °C)

Explosive properties
No information available.

Oxidizing properties
No information available.

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
Hazardous polymerization does not occur.
Reacts with the following substances: Strong acids Oxidizing agents alkaline substances

Conditions to avoid
Keep away from open flames, hot surfaces and sources of ignition.
Extremes of temperature and direct sunlight.

Incompatible materials
no information available

Hazardous decomposition products
Hazardous decomposition products due to incomplete combustion
Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

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
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NTP

equal to 0.1% is on OSHA's list of regulated carcinogens.
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.

Acute dermal toxicity
Acute toxicity estimate: 3,390 mg/kg
Calculation method

Experience with human exposure
Other Relevant Toxicity Information:
Handle in accordance with good industrial hygiene and safety practice.

Components

1-Methoxy-2-propanol acetate (108-65-6):

Acute oral toxicity
LD50 Rat: 6,190 mg/kg
OECD Test Guideline 401 (ECHA)

Acute dermal toxicity
LD50 Rat: > 2,000 mg/kg
OECD Test Guideline 402 (ECHA)

Skin irritation
Rabbit
Result: No skin irritation
OECD Test Guideline 404
(ECHA)

Eye irritation
Rabbit
Result: No eye irritation
OECD Test Guideline 405
(ECHA)

Sensitization
Maximization Test Guinea pig
Result: Does not cause skin sensitization.
Method: OECD Test Guideline 406
(ECHA)

Repeated dose toxicity
Rat
male and female
Oral
44 d
daily
NOAEL: >= 1,000 mg/kg
OECD Test Guideline 422
(ECHA), Subacute toxicity
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Germ cell mutagenicity
Genotoxicity in vitro
Ames test
Salmonella typhimurium
Result: negative
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
(ECHA)

Teratogenicity
Application Route: Inhalation
Rat
Number of exposures: daily
Test period: 21 d
Method: OECD Test Guideline 414
(ECHA)
STOT-single exposure
Assessment: May cause drowsiness or dizziness.
Remarks: (ECHA)

Diazonaphthoquinonesulfonic ester (67829000004-7792P):

Acute oral toxicity
LD50 Rat: > 5,000 mg/kg
OECD Test Guideline 401 (ECHA)

Skin irritation
Rabbit
Result: Skin irritation
OECD Test Guideline 404
(ECHA)

Eye irritation
Result: No eye irritation
in vitro eye irritation test
(own results)

Sensitization
Local lymph node assay (LLNA) Mouse
Result: Does not cause skin sensitization.
Method: OECD Test Guideline 442B
(ECHA)

Germ cell mutagenicity
Genotoxicity in vitro
Ames test
Salmonella typhimurium
Result: negative
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)
(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.
Discharge into the environment must be avoided.

Components

1-Methoxy-2-propanol acetate (108-65-6):

Toxicity to fish
static test LC50 Oncorhynchus mykiss (rainbow trout): 134 mg/l; 96 h
OECD Test Guideline 203 (ECHA)

Toxicity to daphnia and other aquatic invertebrates
static test EC50 Daphnia magna (Water flea): 408 mg/l; 48 h
OECD Test Guideline 202 (ECHA)

Toxicity to algae
static test NOEC Pseudokirchneriella subcapitata (green algae): > 1,000 mg/l; 96 h
Analytical monitoring: yes
OECD Test Guideline 201 (ECHA)

static test ErC50 Pseudokirchneriella subcapitata (green algae): > 1,000 mg/l; 96 h
Analytical monitoring: yes
OECD Test Guideline 201 (ECHA)

Toxicity to bacteria
static test EC10 activated sludge: > 1,000 mg/l; 30 min
OECD Test Guideline 209 (ECHA)

static test EC20 activated sludge: > 1,000 mg/l; 30 min
OECD Test Guideline 209 (ECHA)

Toxicity to fish (Chronic toxicity)
flow-through test NOEC Oryzias latipes (Orange-red killifish): 47.5 mg/l; 14 d
Analytical monitoring: yes
OECD Test Guideline 204 (ECHA)
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**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**  
semi-static test NOEC Daphnia magna (Water flea): >= 100 mg/l; 21 d

Analytical monitoring: yes

OECD Test Guideline 211 (ECHA)

**Biodegradability**  
83 %; 28 d; aerobic  
OECD Test Guideline 301F (ECHA)  
Readily biodegradable.

**Biochemical Oxygen Demand (BOD)**  
330 mg/l (5 d)  
(IUCN)

**Chemical Oxygen Demand (COD)**  
1,740 mg/l  
(IUCN)

**Theoretical oxygen demand (ThOD)**  
1,820 mg/l  
(IUCN)

**Partition coefficient: n-octanol/water**  
log Pow: 1.2 (20 °C)  
OECD Test Guideline 117  
Bioaccumulation is not expected. (ECHA)

Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

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**Diazonaphthoquinonesulfonic ester (678290000004-7792P):**

**Toxicity to fish**  
static test LC50 Danio rerio (zebra fish): 22 - 50 mg/l; 96 h  
OECD Test Guideline 203 (ECHA)

**Toxicity to daphnia and other aquatic invertebrates**  
LC50 Daphnia magna (Water flea): 13.76 mg/l; 48 h The value is calculated

**Toxicity to algae**  
static test EL50 Desmodesmus subspicatus (green algae): 12 mg/l; 72 h  
Analytical monitoring: yes  
OECD Test Guideline 201 (ECHA)

**Toxicity to bacteria**  
IC50: > 1,000 mg/l  
OECD Test Guideline 209

static test EL50 Desmodesmus subspicatus (green algae): 12 mg/l; 72 h  
OECD Test Guideline 201
Biodegradability
39 %; 28 d; aerobic
OECD Test Guideline 301 D
(ECHA)
Not readily biodegradable.

Partition coefficient: n-octanol/water
log Pow: 3.2
(calculated)
EPI Suite™ Bioaccumulation is not expected.

Surface tension
72 mN/m
at 20 °C
Method: OECD Test Guideline 115

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 : UN 1993
Proper shipping name : Flammable liquids, n.o.s.
(2-methoxy-1-methylethyl acetate)
Class : 3
Packing group : III
Labels : Class 3 - Flammable liquids
ERG Code : 128
Marine pollutant : no
Remarks : LTD QTY <= 5 L net capacity, as per 49 CFR 173.150,
Combustible Liquid if flash point >= 38 °C (100 °F), as per 49 CFR.173.150(f)

International Regulations
IATA-DGR
UNID No. : UN 1993
Proper shipping name : Flammable liquid, n.o.s.
(2-methoxy-1-methylethyl acetate)
Class : 3
Packing group : III
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Labels: Class 3 - Flammable liquids
Packing instruction (cargo aircraft): 366
Packing instruction (passenger aircraft): 355

IMDG-Code
UN number: UN 1993
Proper shipping name: FLAMMABLE LIQUID, N.O.S.
(2-methoxy-1-methylethyl acetate)
Class: 3
Packing group: III
Labels: 3
EmS Code: F-E, S-E
Marine pollutant: no

Special precautions for user
Not applicable

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know
CERCLA Reportable Quantity
Cresol 1319-77-3 100lbs

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity
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 80).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 88.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMIL Intermediate or Final VOC's (40 CFR 60.489).

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

- Cresol 1319-77-3
- Formaldehyde 50-00-0

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

- Cresol 1319-77-3
- Formaldehyde 50-00-0

US State Regulations

Massachusetts Right To Know
- Formaldehyde 50-00-0

Pennsylvania Right To Know
- acelone 67-64-1
- Cresol 1319-77-3
- Formaldehyde 50-00-0

California Prop. 65
- Formaldehyde

WARNING: This product can expose you to one or more chemicals which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov 50-00-0

WARNING: This product can expose you to one or more chemicals which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov 67-64-1

N-methyl-2-pyrrolidone 872-50-4

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.