SAFETY DATA SHEET

AZ MIR 703 PHOTORESIST (14 CPS)

SECTION 1. IDENTIFICATION

Product identifier
: AZ MIR 703 PHOTORESIST (14 CPS)

Product number
: 581093

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, 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

Flammable liquids
: Category 3

Serious eye damage
: Category 1

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

GHS label elements

Hazard pictograms
: 

Signal Word
: Danger

Hazard Statements
: H226 Flammable liquid and vapor.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.

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.
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.
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**

**Substance / Mixture**: Mixture
Chemical nature  
Photoresist  
Mixture contains:  
organic solvents  
Polymer  

### Hazardous ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Concentration (% w/w)</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl lactate</td>
<td>&gt;= 50 - &lt; 70</td>
<td>97-64-3</td>
</tr>
<tr>
<td>n-Butylacetate</td>
<td>&gt;= 10 - &lt; 20</td>
<td>123-86-4</td>
</tr>
</tbody>
</table>

### 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. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed  
immediately make victim drink water (two glasses at most). Consult a physician.

Most important symptoms and effects, both acute and delayed  
Irritation and corrosion  
Cough  
Shortness of breath  
Risk of serious damage to eyes.

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. Forms explosive mixtures with air at elevated temperatures. Development of hazardous combustion gases or vapors possible in the event of fire.  

Further information  
Cool closed containers exposed to fire with water spray. Prevent fire extinguishing water from contaminating surface water or the ground water system.
SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Environmental precautions:
- Do not flush into surface water or sanitary sewer system. Risk of explosion.

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. Chemizorb®). Dispose of properly. Clean up affected area.

SECTION 7. HANDLING AND STORAGE

Precautions for safe handling
- Advice on protection against fire and explosion: Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge. 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/PERSOAL PROTECTION**

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value type (Form of exposure)</th>
<th>Control parameters / Permissible concentration</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Butylacetate</td>
<td>123-86-4</td>
<td>TWA</td>
<td>150 ppm 710 mg/m³</td>
<td>NIOSH REL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>200 ppm 950 mg/m³</td>
<td>NIOSH REL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>150 ppm 710 mg/m³</td>
<td>OSHA Z-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>150 ppm 710 mg/m³</td>
<td>OSHA P0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>200 ppm 950 mg/m³</td>
<td>OSHA P0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>50 ppm</td>
<td>ACGIH</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>150 ppm</td>
<td>ACGIH</td>
</tr>
</tbody>
</table>

**Hazardous components without workplace control parameters**

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl lactate</td>
<td>97-64-3</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**: required when vapors/aerosols are generated.
- **Hand protection**
  - Additional Protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products.

- **Protective measures**: Flame retardant antistatic protective clothing.
- **Eye protection**: Tightly fitting safety goggles
- **Body Protection**: Protective clothing

- **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
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, amber, red</td>
</tr>
<tr>
<td>Odor</td>
<td>strong characteristic</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>311 °F (155 °C)</td>
</tr>
<tr>
<td>Flash point</td>
<td>approximately 118 °F (48 °C)</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>ca.4 Torr at 68 °F (20 °C)</td>
</tr>
<tr>
<td>Relative vapor density</td>
<td>No information available.</td>
</tr>
<tr>
<td>Density</td>
<td>1.065 g/cm³</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.065</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: No information available.
Explosive properties: No information available.
Oxidizing properties: No information available.

SECTION 10. STABILITY AND REACTIVITY

Reactivity: Vapor/air-mixtures are explosive at intense warming.
Chemical stability:
- Sensitivity to light: The product is chemically stable under standard ambient conditions (room temperature).
Possibility of hazardous reactions: Hazardous polymerization does not occur.
Conditions to avoid:
- Heating. 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 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: 3,933 mg/kg
Calculation method

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

Eye irritation
Mixture causes serious eye damage.

Experience with human exposure
Other Relevant Toxicity Information:
Other dangerous properties can not be excluded. Handle in accordance with good industrial hygiene and safety practice.

Components

Ethyl lactate (97-64-3):

Acute oral toxicity
LD50 Rat: > 2,000 mg/kg (HSDB)

Acute inhalation toxicity
LC50 Rat: > 5.4 mg/l; 4 h; dust/mist (HSDB)

Acute dermal toxicity
LD50 Rabbit: > 5,000 mg/kg (HSDB)

Skin irritation
Human
Result: No irritation
Patch Test 24 Hrs. (HSDB)

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

Sensitization
Human experience
Result: negative (HSDB)
STOT-single exposure
Exposure route: Inhalation
Assessment: May cause respiratory irritation.
n-Butylacetate (123-86-4):

Acute oral toxicity
LD50 Rat: 10,760 mg/kg
OECD Test Guideline 423 (External MSDS)

Acute inhalation toxicity
LC50 Rat: 0.74 mg/l; 4 h; aerosol (ECHA)
OECD Test Guideline 403

Acute dermal toxicity
LD50 Rabbit: > 14,100 mg/kg
OECD Test Guideline 402 (External MSDS)

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

Result: Repeated exposure may cause skin dryness or cracking.
(ECHA)

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

Sensitization
Maximization Test Mouse
Result: Did not cause sensitization on laboratory animals.
(ECHA)

Germ cell mutagenicity
Genotoxicity in vitro
Ames test
Escherichia coli/Salmonella typhimurium
Result: negative
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471 (External MSDS)

Mutagenicity (mammal cell test): chromosome aberration.
Result: negative
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 473 (ECHA)

Teratogenicity
Application Route: Inhalation
Rat
Exposure time: 6 weeks
Method: OECD Test Guideline 414 (ECHA)
STOT single exposure
Target Organs: Central nervous system
Assessment: May cause drowsiness or dizziness.
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

Ethyl lactate (97-64-3):

Toxicity to fish
LC50 Danio rerio (zebra fish): 320 mg/l; 96 h

Toxicity to daphnia and other aquatic invertebrates
EC50 Daphnia magna (Water flea): 560 mg/l; 48 h

Toxicity to algae
ErC50 Pseudokirchneriella subcapitata (green algae): 3,500 mg/l; 72 h

Biodegradability

(External MSDS)
Readily biodegradable.

Partition coefficient: n-octanol/water
log Pow: ca. -0.04
(calculated)
(Lit.) Bioaccumulation is not expected.

Bioaccumulation
(Bioaccumulation is unlikely. (External MSDS))
n-Butylacetate (123-86-4):

Toxicity to fish
flow-through test LC50 Pimephales promelas (fathead minnow): 18 mg/l; 96 h
Analytical monitoring: yes
OECD Test Guideline 203 (External MSDS)

Toxicity to daphnia and other aquatic invertebrates
static test EC50 Daphnia magna (Water flea): 44 mg/l; 48 h (ECHA)

Toxicity to algae
static test ErC50 Desmodesmus subspicatus (green algae): 674.7 mg/l; 72 h (ECHA)

Toxicity to bacteria
EC50 Pseudomonas putida: 959 mg/l; 18 h (IUCLID)

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

Theoretical oxygen demand (ThOD)
2,207 mg/g
(Lit.)

Ratio BOD/ThBOD
BOD5 7 - 46 %
(Lit.)

Partition coefficient: n-octanol/water
log Pow: 2.3 (25 °C)
OECD Test Guideline 107
Bioaccumulation is not expected.

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

Surface tension
61.3 mN/m
at 20 °C

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. (Ethyl lactate, n-Butyl acetate)
- Class: 3
- Packing group: III
- Labels: FLAMMABLE LIQUID
- 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
- UN/ID No.: UN 1993
- Proper shipping name: Flammable liquid, n.o.s. (Ethyl lactate, n-Butyl acetate)
- Class: 3
- Packing group: III
- Labels: 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. (Ethyl lactate, n-Butyl 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
n-Butylacetate 123-86-4 5000lbs
*: Calculated RQ exceeds reasonably attainable upper limit.
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).
The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489):
- n-Butylacetate 123-86-4

Clean Water Act
The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:
- n-Butylacetate 123-86-4

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:
- n-Butylacetate 123-86-4

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
- Ethyl lactate 97-64-3
- n-Butylacetate 123-86-4

Pennsylvania Right To Know
- Ethyl lactate 97-64-3
- n-Butylacetate 123-86-4

New Jersey Right To Know
- Ethyl lactate 97-64-3
- n-Butylacetate 123-86-4

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 : This product contains one or several components that are not on the Canadian DSL nor NDSL.

TSCA list
The following substance(s) is/are subject to a Significant New Use Rule:
4,4’-[1-[4-[1-(4-Hydroxyphenyl)]-1-methylethyl]phenyl]ethylidene]bisphenol
110726-28-8

The following substance(s) is/are subject to TSCA 12(b) export notification requirements:
4,4’-[1-[4-[1-(4-Hydroxyphenyl)]-1-methylethyl]phenyl]ethylidene]bisphenol
110726-28-8

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.