

**AZ MiR(TM) 701 Photoresist (14 CPS)**

Version  
1.0

Revision Date:  
05.02.2019

SDS Number:  
70MDGM184517

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**SECTION 1. IDENTIFICATION**

**Product identifier**

: AZ MiR(TM) 701 Photoresist (14 CPS)

**Product number**

: 184517

**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

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**SECTION 2. HAZARDS IDENTIFICATION**

**GHS Classification**

Flammable liquids : Category 3

Skin irritation : Category 2

Serious eye damage : Category 1

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

**Other hazards**

None known.

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**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture : Mixture

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Chemical nature                      Photoresist  
   Mixture contains:  
   organic solvents  
   Polymer

### Hazardous ingredients

Chemical name	Concentration (% w/w)	CAS-No.
Ethyl lactate	60 - 70	97-64-3
n-Butylacetate	10 - 15	123-86-4
Diazonaphthoquinonesulfonic ester	1 - 10	67829000004-5755P
Phenolic polyol	1 - 5	67829000004-5521P

### SECTION 4. FIRST AID MEASURES

- If inhaled : If inhaled, remove to fresh air.  
If breathing is difficult, give oxygen.  
If symptoms persist, call a physician.
- In case of skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.  
Get medical attention if irritation develops and persists.
- In case of eye contact : Remove contact lenses.  
Flush eyes with water at least 15 minutes. Get medical attention if eye irritation develops or persists.
- If swallowed : Keep respiratory tract clear.  
If conscious, drink plenty of water.  
Never give anything by mouth to an unconscious person.  
Obtain medical attention.
- Most important symptoms and effects, both acute and delayed : None known.

### SECTION 5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- Specific hazards during fire fighting : Combustible.  
  
As the product contains combustible organic ingredients, fire will produce dense black smoke containing hazardous products of combustion (see section 10).
- Further information : Use water spray to cool unopened containers.  
Prevent fire extinguishing water from contaminating surface water or the ground water system.
- Special protective equipment for fire-fighters : In the event of fire, wear self-contained breathing apparatus.  
Use personal protective equipment.

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**SECTION 6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions, protective equipment and emergency procedures : Refer to protective measures listed in sections 7 and 8.
- Environmental precautions : The product should not be allowed to enter drains, water courses or the soil.  
Prevent spreading over a wide area (e.g., by containment or oil barriers).  
Local authorities should be advised if significant spillages cannot be contained.

**SECTION 7. HANDLING AND STORAGE**
**Precautions for safe handling**

Advice on protection against fire and explosion : Keep away from heat and sources of ignition. Take measures to prevent the build up of electrostatic charge. Avoid shock and friction.

Advice on safe handling : Do not breathe vapors or spray mist.  
Do not get on skin or clothing.  
For personal protection see section 8.  
Use only in area provided with appropriate exhaust ventilation.

**Conditions for safe storage, including any incompatibilities**

Storage conditions : Keep container tightly closed in a dry and well-ventilated place.  
May liberate combustible solvent vapors.  
Store at appropriate temperature. See label for details.  
Protected from light.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
n-Butylacetate	123-86-4	TWA	150 ppm 710 mg/m <sup>3</sup>	NIOSH REL
		STEL	200 ppm 950 mg/m <sup>3</sup>	NIOSH REL
		TWA	150 ppm 710 mg/m <sup>3</sup>	OSHA Z-1
		TWA	150 ppm 710 mg/m <sup>3</sup>	OSHA P0

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	STEL	200 ppm 950 mg/m3	OSHA P0
	TWA	50 ppm	ACGIH
	STEL	150 ppm	ACGIH

- Engineering measures** : Handle only in a place equipped with local exhaust (or other appropriate exhaust).
- Personal protective equipment**
- Respiratory protection** : In the case of vapor formation use a respirator with an approved filter.  
Respirator with filter for organic vapor  
Use NIOSH approved respiratory protection.
- Filter type** : ABEK-filter
- Hand protection**  
**Additional Protection** : Chemically resistant gloves
- Protective measures** : Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.  
Avoid contact with the skin and the eyes.
- Eye protection** : Safety glasses with side-shields
- Body Protection** : Protective clothing
- Hygiene measures** : Handle in accordance with good industrial hygiene and safety practice.

**SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES**

- Physical state** liquid
- Form** liquid
- Color** clear  
amber  
red
- Odor** strong  
ester-like  
sweet
- Odor Threshold** No information available.
- pH** Not applicable
- Melting point** No information available.
- Boiling point/boiling range** 311 °F (155 °C)

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Flash point	120 °F (49 °C) Method: closed cup
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapor pressure	ca.4 Torr at 68 °F (20 °C)
Relative vapor density	No information available.
Density	1.05 g/cm <sup>3</sup>
Relative density	No information available.
Water solubility	partly miscible
Partition coefficient: n- octanol/water	No information available.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	No information available.
Explosive properties	Not classified as explosive.
Oxidizing properties	No information available.

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### SECTION 10. STABILITY AND REACTIVITY

Chemical stability	: Stable under normal conditions. Sensitivity to light
Possibility of hazardous reactions	: Hazardous polymerization does not occur.
Hazardous decomposition products	: Hazardous decomposition products due to incomplete combustion Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

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## 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: 2,957 mg/kg

Calculation method

## Experience with human exposure

Other Relevant Toxicity Information:

No toxicological testing was carried out on the preparation.

## Components

*Ethyl lactate (97-64-3):**Acute oral toxicity*

LD50 Oral Rat: &gt; 2,000 mg/kg

*Acute inhalation toxicity*

LC50 Rat: &gt; 5.4 mg/l; 8 h (External MSDS)

LC50 Rat: &gt; 5.4 mg/l; 4 h ; dust/mist (HSDB)

*Acute dermal toxicity*

LD50 Rabbit: &gt; 5,000 mg/kg (HSDB)

LD50 Dermal Rabbit: &gt; 5,000 mg/kg

*Skin irritation*

Human

Result: No irritation

Patch Test 24 Hrs.

(HSDB)

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70MDGM184517*Eye irritation*

Rabbit

Result: Eye Irritation  
(External MSDS)  
Irritating to eyes.

Rabbit

Result: Eye Irritation  
(External MSDS)  
Irritating to eyes.*Sensitization*

Human experience

Result: negative  
(HSDB)

STOT-single exposure

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: Repeated exposure may cause skin dryness or cracking.  
OECD Test Guideline 404  
(External MSDS)*Eye irritation*

Rabbit

Result: No eye irritation  
OECD Test Guideline 405  
(External MSDS)*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)

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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.

***Diazonaphthoquinonesulfonic ester (67829000004-5755P):***

No information available.

***Phenolic polyol (67829000004-5521P):***

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

**Skin irritation**  
Rabbit  
Result: No skin irritation  
OECD Test Guideline 404  
(Lit.)

**Eye irritation**  
Rabbit  
Result: No eye irritation  
OECD Test Guideline 405  
(Lit.)

**Germ cell mutagenicity**  
**Genotoxicity in vitro**  
Ames test  
Result: negative  
Metabolic activation: with and without metabolic activation  
(own results)

**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity**  
**Product****Persistence and degradability**  
No information available.

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**Bioaccumulative potential**  
No information available.

**Mobility in soil**  
No information available.

*Additional ecological information*  
No ecological testing was carried out on the preparation.

**Components**

*Ethyl lactate (97-64-3):*

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

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 (External MSDS)

EC50 Daphnia magna (Water flea): 560 mg/l; 48 h

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

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

*Biodegradability*  
  
(External MSDS)  
Readily biodegradable.

OECD  
(External MSDS)  
Readily biodegradable.

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

*Bioaccumulation*  
(Bioaccumulation is unlikely. (External MSDS))

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flow-through test LC50 Pimephales promelas (fathead minnow): 18 mg/l; 96 h

Analytical monitoring: yes

OECD Test Guideline 203 (External MSDS)

LC50 Lepomis macrochirus (Bluegill sunfish): 100 mg/l; 96 h

*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 meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.

*Surface tension*

61.3 mN/m

at 20 °C

*Diazonaphthoquinonesulfonic ester (6782900004-5755P):**Toxicity to daphnia and other aquatic invertebrates*

EC50 Daphnia magna (Water flea): &gt; 17.6 mg/l; 48 h

OECD Test Guideline 202

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*Biodegradability*  
10 %, 28 d  
(ECHA)  
Not readily biodegradable.

*Partition coefficient: n-octanol/water*  
log Pow:  $\geq 4.5$  (25 °C)  
Potential bioaccumulation (ECHA)

### *Phenolic polyol (6782900004-5521P):*

*Toxicity to daphnia and other aquatic invertebrates*  
Daphnia magna (Water flea); 96 h  
OECD Test Guideline 202 No observable toxic effect in saturated solution.

*Partition coefficient: n-octanol/water*  
log Pow: 3 (24 °C)  
Bioaccumulation is not expected.

*Surface tension*  
71.9 mN/m  
at 20 °C

## SECTION 13. DISPOSAL CONSIDERATIONS

- Product Waste : Dispose of as hazardous waste in compliance with local and national regulations.  
For disposal, this material is a flammable hazardous waste under RCRA.
- Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
- RCRA number : RCRA number: D001  
Yes -- If it becomes a waste as sold.

## SECTION 14. TRANSPORT INFORMATION

- DOT / 49CFR
- UN/ID/NA number : UN NA 1993
- Proper shipping name : Combustible liquid, n.o.s.  
(Ethyl lactate, n-Butyl acetate)
- Class : CBL
- Packing group : III
- Labels : None
- ERG Code : 128

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Marine pollutant : no

**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.

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**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 SOCOMI Intermediate or Final VOC's (40 CFR 60.489):

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

n-Butylacetate	123-86-4
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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
Diazonaphthoquinonesulfonic ester	67829000004-5755P
Phenolic polyol	67829000004-5521P

**New Jersey Right To Know**

Ethyl lactate	97-64-3
n-Butylacetate	123-86-4
Diazonaphthoquinonesulfonic ester	67829000004-5755P
Phenolic polyol	67829000004-5521P

**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	: This product contains one or several components that are not on the Canadian DSL nor NDSL.
TSCA	: One or more components of this product are not listed on the

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TSCA Inventory. The components, however, are covered by Low Volume Exemptions (LVEs).

**TSCA list**

The following substance(s) is/are subject to a Significant New Use Rule:

Phenolic polyol

67829000004-5521P

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

**Other Regulatory Information**

This product contains a substance which is subject, under TSCA 5(a), to Significant New Use Rule (SNUR). The SNUR allows for use with restrictions set forth in 40 CFR 721.10325. Processes which result in surface water concentrations of the substance exceeding 10 ppb are not permitted. It also has a TSCA Section 12(b) export notification requirement, if exporting the product.

This product is subject to the Export and Customs Control Regulations of the United States and is not to be exported or transferred without prior notification to and approval by the vendor, and not without obtaining proper U.S.A. and local government authorizations.  
ECCN 3C992

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**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.