

SAFETY DATA SHEET



AZ 3330-F Photoresist

Version
1.0

Revision Date:
23.05.2017

SDS Number:
70MDGM184426

SECTION 1. IDENTIFICATION

Product identifier

: AZ 3330-F Photoresist

Product number : 184426

Recommended use of the chemical and restrictions on use
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

Flammable liquids : Category 3

Skin irritation : Category 2

Serious eye damage : Category 1

Skin sensitization : Category 1

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

GHS label elements

Hazard pictograms :



Signal Word : Danger

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Hazard Statements : H226 Flammable liquid and vapor.
 H315 Causes skin irritation.
 H317 May cause an allergic skin reaction.
 H318 Causes serious eye damage.
 H335 + H336 May cause respiratory irritation, and drowsiness or dizziness.

Precautionary Statements : **Prevention:**
 P210 Keep away from heat/sparks/open flames/hot surfaces.
 No smoking.
 P233 Keep container tightly closed.
 P243 Take precautionary measures against static discharge.
 P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
 P272 Contaminated work clothing must not be allowed out of the workplace.
 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.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P362 Take off contaminated clothing and wash before reuse.
 P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 + P235 Store in a well-ventilated place. Keep cool.
 P404 Store in a closed container.

Disposal:

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

Other hazards

The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: < 7 %

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

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Chemical nature Photoresist

Hazardous ingredients

Chemical name	Concentration (% w/w)	CAS-No.
2-Methoxy-1-methylethyl acetate	40 - 45	108-65-6
Ethyl lactate	20 - 25	687-47-8
Diazonaphthoquinonesulfonic ester	5 - 10	67829000004-5762P
Aromatic hydroxy compound	< 2	67829000004-5670P
2-Methoxypropyl acetate-1	< 0.3	70657-70-4

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.

SECTION 6. ACCIDENTAL RELEASE MEASURES

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- 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.

- Methods and materials for containment and cleaning up : Wearing appropriate personal protective equipment, contain spill, ventilate area of spill or leak, remove all sparking devices or ignition sources, collect onto inert absorbent, and place in a suitable container.

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.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
2-Methoxy-1-methylethyl acetate	108-65-6	TWA	50 ppm	US WEEL

- Engineering measures : Handle only in a place equipped with local exhaust (or other appropriate exhaust).

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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.
Hand protection	:	
Additional Protection	:	Chemical resistant gloves
Protective measures	:	Do not breathe vapours, aerosols or mists. Avoid contact with eyes and skin
Eye protection	:	Safety eyewear to protect against splashes.
Body Protection	:	Clothing suitable to prevent skin contact.
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 characteristic ester-like
Odor Threshold	No information available.
pH	No information available.
Melting point	No information available.
Boiling point	No information available.
Flash point	110 °F (43 °C)
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.

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Vapor pressure	ca.2.8 Torr at 68 °F (20 °C)
Relative vapor density	No information available.
Density	ca.1.06 g/cm ³ at 77 °F (25 °C)
Relative density	No information available.
Water solubility	The solvent is partially water soluble but the product forms two layers.
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	No information available.
Oxidizing properties	No information available.

SECTION 10. STABILITY AND REACTIVITY

Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Hazardous polymerization does not occur.
Conditions to avoid	: Avoid contact with oxidizing agents. Avoid contact with strong acids Avoid contact with alkaline materials.
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

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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 ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
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.

Acute oral toxicity

Acute toxicity estimate: > 5,000 mg/kg

Calculation method

Experience with human exposure

Other Relevant Toxicity Information:

No toxicological testing was carried out on the preparation.

Ingredients*2-Methoxy-1-methylethyl acetate (108-65-6):**Acute oral toxicity*

LD50 Rat: 8,532 mg/kg (RTECS)

Acute inhalation toxicity

Rat: > 4350 ppm

Acute dermal toxicity

LD50 Rabbit: > 5,000 mg/kg Source : OECD SIDS

Skin irritation

Rabbit

Result: No irritation

OECD Test Guideline 404

Eye irritation

Rabbit

Result: Irritating to eyes.

Sensitization

Maximization Test Guinea pig

Result: Does not cause skin sensitization.

Method: OECD Test Guideline 406

Repeated dose toxicity

Rat

males

-

6 h

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NOAEL: 1.62 mg/l
LOAEL: 5.39 mg/l
Subacute toxicity

Rat
female

-

6 h
NOAEL: 5.39 mg/l
LOAEL: 16.18 mg/l
Subacute toxicity

*Germ cell mutagenicity**Genotoxicity in vitro*

Ames test

Salmonella typhimurium

Result: negative

Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 471

CMR effects

Teratogenicity:

Oral and Inhalation developmental toxicity studies were conducted in pregnant rats and rabbits with PGMEA (1-Methoxy-2-propanol acetate) containing approximately 2% beta isomer (cited in 1-METHOXY-2-PROPANOL ACETATE OECD SIDS Report). No statistically significant effects were noted in developmental parameters at any of the dose levels tested (Oral study - up to 1,000 mg/kg/day and inhalation study - up to 4000 ppm).

STOT-single exposure

Assessment: May cause respiratory irritation.

Remarks: Source : NITE

*Ethyl lactate (687-47-8):**Acute oral toxicity*

LD50 Rat: > 2,000 mg/kg

Acute inhalation toxicity

LC50 Rat: > 5.4 mg/l; 8 h Source : Supplier MSDS

Acute dermal toxicity

LD50 Rabbit: > 5,000 mg/kg

Skin irritation

Result: Mild skin irritation

Eye irritation

Rabbit

Result: Severe eye irritation

(External MSDS)

Risk of serious damage to eyes.

Sensitization

Result: Did not cause sensitization on laboratory animals.

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70MDGM184426*Diazonaphthoquinonesulfonic ester (67829000004-5762P):*

Acute oral toxicity
LD50 Rat: > 2,000 mg/kg
OECD Test Guideline 401

Skin irritation
Rabbit
Result: No skin irritation
OECD Test Guideline 404

Eye irritation
Rabbit
Result: No eye irritation
OECD Test Guideline 405
slight irritation

Sensitization
Maximization Test Guinea pig
Result: Did not cause sensitization on laboratory animals.
Method: OECD Test Guideline 406

Germ cell mutagenicity
Genotoxicity in vitro
Ames test
Result: negative
Method: Mutagenicity (Escherichia coli - reverse mutation assay)

Aromatic hydroxy compound (67829000004-5670P):

No information available.

2-Methoxypropyl acetate-1 (70657-70-4):

Acute inhalation toxicity
Data refers to Beta Isomer
CMR effects

Teratogenicity:

The beta isomer, 2-Methoxy-1-propanol acetate, was tested by itself for developmental/teratogenic effects in pregnant rats and rabbits. Developmental/teratogenic effects were observed in both species via the inhalation route of exposure. In rabbits, the effects only occurred in the highest dose group (545 ppm) in absence of any significant maternal toxicity. In rats, these effects were also only observed in the highest dose group, but in the presence of significant maternal toxicity, which placed the cause of the developmental effects in question. The No Observable Adverse Effect Level, NOAEL, for the inhalation exposures in rabbits with the pure beta isomer was determined to be 145 ppm, this equates to exposure of 1-Methoxy-2-propanol acetate with a level of beta isomer > 2%. Since this Product formulation contains < 0.3% of the beta isomer, it is judged that exposure to this product formulation does not pose a reproductive hazard.

Reproductive toxicity:
May damage the unborn child.
STOT-single exposure
Exposure route: Inhalation

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Assessment: May cause respiratory irritation.
Remarks: Source : Directive 67/548/EEC

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.

Ingredients

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

Toxicity to fish
LC50 *S.gairdnerii*: 100 - 180 mg/l; 96 h
OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates
EC50 *Daphnia magna* (Water flea): 373 mg/l; 48 h
OECD Test Guideline 202

Toxicity to algae
EC50 *Pseudokirchneriella subcapitata* (green algae): > 1,000 mg/l; 96 h
OECD Test Guideline 201

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

Toxicity to fish (Chronic toxicity)
NOEC *Oryzias latipes* (Orange-red killifish): 47.5 mg/l; 14 d
OECD Test Guideline 204

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)
semi-static test NOEC *Daphnia magna* (Water flea): >= 100 mg/l; 21 d
OECD Test Guideline 211

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70MDGM184426*Biodegradability*100 %; 8 d
OECD Test Guideline 302B
Readily eliminated from water*Biochemical Oxygen Demand (BOD)*330 mg/g (5 d)
(IUCLID)*Chemical Oxygen Demand (COD)*1,740 mg/g
(IUCLID)*Theoretical oxygen demand (ThOD)*1,820 mg/g
(IUCLID)*Partition coefficient: n-octanol/water*log Pow: 1.2 (20 °C)
OECD Test Guideline 117
Bioaccumulation is not expected.

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

*Ethyl lactate (687-47-8):**Toxicity to fish*LC50 Danio rerio (zebra fish): 320 mg/l; 96 h
OECD Test Guideline 203 (External MSDS)*Toxicity to daphnia and other aquatic invertebrates*EC50 Daphnia magna (Water flea): 683 mg/l; 48 h
OECD Test Guideline 202*Toxicity to algae*

IC50 Pseudokirchneriella subcapitata (green algae): 2,200 mg/l; 70 h (External MSDS)

*Biodegradability*86 %; 28 d
Readily biodegradable.*Chemical Oxygen Demand (COD)*

1,620 mg/g

*Diazonaphthoquinonesulfonic ester (67829000004-5762P):**Toxicity to fish*LC50 Danio rerio (zebra fish): > 500 mg/l; 96 h
OECD Test Guideline 203

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Biodegradability
< 20 %; 28 d
Modified Sturm Test
Not readily biodegradable.

Partition coefficient: n-octanol/water
log Pow: 4
OECD Test Guideline 107

Aromatic hydroxy compound (6782900004-5670P):

No information available.

2-Methoxypropyl acetate-1 (70657-70-4):

Toxicity to fish
LC50: 124 mg/l; 96 h (ECOTOX Database)

Toxicity to daphnia and other aquatic invertebrates
: 2,333 mg/l; 48 h (ECOTOX Database)

Toxicity to algae
EC50: 9.337 mg/l; 96 h (ECOTOX Database)

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 1993
Proper shipping name : Flammable liquids, n.o.s.

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(2-methoxy-1-methylethyl acetate, Ethyl lactate)
 Class : 3
 Packing group : III
 Labels : FLAMMABLE LIQUID
 ERG Code : 128
 Marine pollutant : no

International Regulations
IATA-DGR

UN/ID No. : UN 1993
 Proper shipping name : Flammable liquid, n.o.s.
 (2-methoxy-1-methylethyl acetate, Ethyl lactate)
 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.
 (2-methoxy-1-methylethyl acetate, Ethyl lactate)
 Class : 3
 Packing group : III
 Labels : 3
 EmS Code : F-E, S-E
 Marine pollutant : no

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.

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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).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMII 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

2-Methoxy-1-methylethyl acetate	108-65-6
Ethyl lactate	687-47-8
Diazonaphthoquinonesulfonic ester	67829000004-5762P
Aromatic hydroxy compound	67829000004-5670P

New Jersey Right To Know

2-Methoxy-1-methylethyl acetate	108-65-6
Ethyl lactate	687-47-8
Diazonaphthoquinonesulfonic ester	67829000004-5762P
Aromatic hydroxy compound	67829000004-5670P

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 components listed on the Canadian NDSL list. All other components are on the Canadian DSL list.
TSCA	: All components of the product are listed in the TSCA-inventory.

SECTION 16. OTHER INFORMATION

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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.

