



SAFETY DATA SHEET
AZ P4400 PHOTORESIST

Substance No.: GHSBBG70L8
Version 4.0

Revision Date 12/31/2014
Print Date 12/31/2014

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

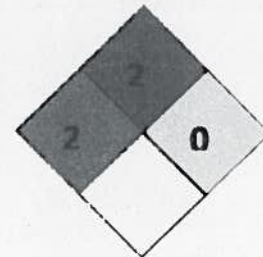
Product name : AZ P4400 PHOTORESIST
Product Use Description : Intermediate for electronic industry
Company : EMD Performance Materials Corp.
An affiliate of Merck KGaA, Darmstadt Germany
One International Plaza, Suite 300
Philadelphia, PA 19113
Telephone : 1-888-367-3275
Emergency telephone number : 1-800-424-9300 (CHEMTREC)

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

HMIS Classification : Health hazard: 2
Flammability: 2
Reactivity: 0
PPE: X

NFPA Classification : Health hazard: 2
Fire Hazard: 2
Reactivity Hazard: 0
Special Hazards: NONE



GHS Classification

Hazard category, Hazard class : Flammable Liquids, Category 3
Hazard category, Hazard class : Eye irritation, Category 2A
Hazard category, Hazard class : Specific target organ toxicity - single exposure, Category 3



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GHS-Labeling

Symbol(s)



Signal word

: Warning

Hazard statements

: Flammable liquid and vapour.
Causes serious eye irritation.
May cause respiratory irritation, and drowsiness or dizziness.

Precautionary statements

: **Prevention:**
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting/ equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Wash skin thoroughly after handling.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or if you feel unwell:
Get medical advice/ attention.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
Storage:
Store in a well-ventilated place. Keep cool.
Store in a closed container.
Disposal:
Dispose of contents/ container to an approved waste disposal plant.

Special labelling of certain mixtures :

The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 30 %



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SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous ingredients

Component	CAS No.	Weight percent
1-Methoxy-2-propanol acetate	108-65-6	65 - 70
Diazonaphthoquinonesulfonic esters	67829000004-6623P	1 - 5
2-Methoxy-1-propanol acetate	70657-70-4	< 0.3

Non-hazardous ingredients

Component	CAS-No.	Weight percent
Cresol novolak resin	67829000004-5653P	25 - 35

SECTION 4. FIRST AID MEASURES

First aid procedures

- Inhalation** : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If symptoms persist, call a physician.
- Skin contact** : Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if irritation develops and persists.
- Eye contact** : Remove contact lenses. Flush eyes with water at least 15 minutes. Get medical attention if eye irritation develops or persists.
- Ingestion** : Keep respiratory tract clear. If conscious, drink plenty of water. Never give anything by mouth to an unconscious person. Obtain medical attention.

SECTION 5. FIREFIGHTING MEASURES

Flammable properties

- Flash point** : 112 °F (44 °C)
Method: closed cup



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Fire fighting

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Further information : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Cool containers/tanks with water spray.

Protective equipment and precautions for firefighters

Specific hazards during firefighting : As the product contains combustible organic components, fire will produce dense black smoke containing hazardous products of combustion (see section 10).

SECTION 6. ACCIDENTAL RELEASE MEASURES

Environmental precautions : Do not allow entry to drains, water courses or soil. Prevent spreading by use of suitable barriers. Local authorities should be advised if significant spillages cannot be contained.

Methods for containment / Methods for 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

Handling

Handling : Do not breathe vapours 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.

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.

Storage

Further information on 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.



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SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Components with workplace control parameters

Components	CAS-No.	Control parameters	Basis
1-Methoxy-2-propanol acetate	108-65-6	TWA: 50 ppm	US WEEL

Engineering measures

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

Personal protective equipment

Eye protection : Safety eyewear to protect against splashes.

Hand protection : Solvent-resistant gloves

Skin and body protection : Clothing suitable to prevent skin contact.

Respiratory protection : In the case of vapour formation use a respirator with an approved filter.
Respirator with filter for organic vapour
Use NIOSH approved respiratory protection.

Hygiene measures : Observe the usual precautions when handling chemicals.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form : Liquid

Color : Clear, amber-red

Odor : Strong, characteristic odor.

Safety data

Flash point : 112 °F (44 °C)
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Starts to boil	: 293 °F (145 °C)
Vapour pressure	: 3.2 Torr at 68 °F (20 °C)
Density	: ca.1.06 g/cm ³ at 68 °F (20 °C)
Water solubility	: The solvent is partially water soluble but the product forms two layers.
VOC	: 700 g/l (Calculated value)
Loss on drying	: >= 65 %

SECTION 10. STABILITY AND REACTIVITY

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).
Hazardous reactions	: Hazardous polymerisation does not occur.
Chemical stability	: Stable under normal conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Data for AZ P4400 PHOTORESIST

Further information : No toxicological testing was carried out on the preparation.



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Data for 1-Methoxy-2-propanol acetate (108-65-6)

- Acute oral toxicity : LD50: 8,532 mg/kg
Species: rat
- Acute inhalation toxicity : LC50: > 23.8 mg/l
Exposure time: 6 h
Species: rat
- Acute dermal toxicity : LD50: > 5,000 mg/kg
Species: rabbit
- Skin irritation : Result: non-irritant
- Eye irritation : Result: Moderate eye irritation
Source : Supplier MSDS
- Sensitisation : Species: Guinea pig
Result: non-sensitizing

Toxicology Assessment

- 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).



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Data for 2-Methoxy-1-propanol acetate (70657-70-4)

Acute inhalation toxicity : Data refers to Beta Isomer

Toxicology Assessment

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.

Data for Diazonaphthoquinonesulfonic esters (67829000004-5546P)

Acute oral toxicity : LD50 Oral: > 5,000 mg/kg
Species: rat
By analogy with a similar product.

Skin irritation : Species: rabbit
Result: No skin irritation

Eye irritation : Species: rabbit
Result: slight irritant effect - does not require labelling
Classification: not irritating

SECTION 12. ECOLOGICAL INFORMATION

Data for AZ P4400 PHOTORESIST

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



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Data for 1-Methoxy-2-propanol acetate (108-65-6)

Ecotoxicity effects

- Toxicity to fish : LC50: 100 - 180 mg/l Exposure time: 96 h
Species: Oncorhynchus mykiss (rainbow trout)
- : LC50: 161 mg/l Exposure time: 96 h
Species: Fish general (Pisces)
- : NOEC: 100 mg/l Exposure time: 96 h
Species: Fish general (Pisces)
- Toxicity to daphnia and other aquatic invertebrates : EC50: > 500 mg/l
Species: Daphnia magna
- Toxicity to bacteria : EC20: 1,000 mg/l
Exposure time: 30 min
Species: activated sludge

Elimination information (persistence and degradability)

- Biodegradability : Method: OECD 302 B
: The product is biodegradable.

Data for Diazonaphthoquinonesulfonic esters (67829000004-5546P)

Ecotoxicity effects

- Toxicity to fish : LC50: 20 - 50 mg/l Exposure time: 96 h
Species: Danio rerio (zebra fish)
By analogy with a similar product.
- Toxicity to bacteria : EC50: > 1,000 mg/l
Method: OECD 209

Elimination information (persistence and degradability)

- Biodegradability : Result: Not readily biodegradable.
Method: OECD 301 D

Further information on ecology

- Chemical Oxygen Demand (COD) : 1.716 mg/g



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SECTION 13. DISPOSAL CONSIDERATIONS

- Further information : 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 hazardous waste : RCRA number: D001
Yes -- If it becomes a waste as sold.

SECTION 14. TRANSPORT INFORMATION

DOT
Not restricted

IATA

- UN number : 1993
Description of the goods : Flammable liquid, n.o.s.
(2-Methoxy-1-methylethyl acetate)
- Class : 3
Packing group : III
Labels : 3
Environmentally hazardous : no
Additional data for transport : PASSENGER AIRCRAFT SHIPMENT OF GLASS
CONTAINERS >2.5L NOT PERMITTED. CARGO AIRCRAFT
ONLY!

IMDG

- UN number : 1993
Description of the goods : FLAMMABLE LIQUID, N.O.S.
(2-Methoxy-1-methylethyl acetate)
- Class : 3
Packing group : III
Labels : 3
EmS Number 1 : F-E
EmS Number 2 : S-E
Marine pollutant : no
Environmentally hazardous : no



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SECTION 15. REGULATORY INFORMATION

Notification status

- TSCA** : All components of this product are listed on the TSCA Inventory.
- DSL** : All components of this product are on the Canadian DSL.
- WHMIS Classification** : B3: Combustible Liquid
- Canadian PBT Chemicals** : This product does not contain any components on the DSL that are classified as Persistent, Bioaccumulative and Toxic (PBT) under CEPA.

CERCLA Reportable Quantity :

This material does not contain any components with a CERCLA RQ.

Carcinogenicity

- IARC** : No component 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 identified as a carcinogen or potential carcinogen by OSHA.
- NTP** : No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
- ACGIH** : No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

EPCRA - Emergency Planning and Community Right-to-Know Act

SARA 302 Reportable Quantity : This material does not contain any components with a SARA 302 RQ.

SARA 304 Extremely Hazardous Substances : This material does not contain any components with a section 304 EHS RQ.

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
Ozone-Depletion Potential

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).

US. Clean Air Act - Hazardous Air Pollutants (HAP)

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 12 (40 CFR 61).

US. Clean Air Act Section 112(r); Regulated toxic and flammable substances 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 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

US. Clean Air Act Section 111 SOCM I Intermediate or Final Volatile Organic Compunds (VOC) - 40 CFR part 60.489

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

US State Regulations

Massachusetts Right To Know Components

: No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

: 1-Methoxy-2-propanol acetate	108-65-6
Cresol novolak resin	67829000004-5653P
Diazonaphthoquinonesulfonic esters	67829000004-6623P



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New Jersey Right To Know Components	: 1-Methoxy-2-propanol acetate	108-65-6
	Cresol novolak resin	67829000004-5653P
	Diazonaphthoquinonesulfonic esters	67829000004-6623P
California Prop. 65 Components	: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.	

SECTION 16. OTHER INFORMATION

This information is supplied under the OSHA Hazard Communication Standard, 29 CFR 1910.1200, and is offered in good faith based on data available to us that we believe to be true and accurate. For any sub-heading within any section not addressed herein, no relevant information is determined or applicable. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable to the material. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate for that use. No warranty, express or implied, is made regarding the accuracy of this data, the hazards connected with the use of the material, or the results to be obtained from the use thereof. We assume no responsibility for damage or injury from the use of the product described herein. Data provided here are typical and not intended for use as product specifications.



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