



AZ 1500 Series

Standard
Photoresists

GENERAL INFORMATION

This series of positive photoresists actually consists of three different products. They all contain the same photoactive compound (PAC) which responds to the whole UV-spectrum from 310 - 440 nm covering the three main mercury lines, i, h and g. They may be used with broadband as well as monochromatic exposure. Different novolak resins or fractions thereof were chosen to adopt them for different demands, this is indicated by a corresponding suffix of the product designation:

AZ 1500 (no suffix) is the most popular family and a direct safer solvent (PGMEA) substitute for AZ 1370, AZ 1470 , AZ 1350J, AZ 1450J, AZ 1375. It is available in different viscosities to cover the coating thickness range from 0.5 to 4.0 μm . Due to the slightly lower evaporation rate of the PGMEA (compared to cellosolve acetate based solvent system) these resists will show about 5 - 10% higher photospeed which may be compensated by increasing prebake temperature about 5°C. This resists may be used for wet- and dry-etch and cover all demands for general semiconductor manufacturing and other applications with resolution down to 1 μm .

AZ 1514 H is the safer solvent substitute for the well known AZ 1350 H which is now almost 25 years old and intended for contact and proximity printing. For this application a low photospeed for better control of exposure (about 10s at 15 mW/cm²) and thus a forgiving resist is the best choice. For many years the "non safe solvent" counterparts AZ 111 S and AZ 1350 H have been the standard resists for making semiconductors, AZ 111 S for wet-etch of oxides, AZ 1350 H for aluminium and nitride etch.

AZ 1500 HS family was developed in 1990. The background for this development was the fact that in making discrete and bipolar semiconductor devices wet-etching is still very common. For wet-etching adhesion is the most important issue. Especially on aluminium the mousebite-phenomenon is well known. To solve this problem we have chosen a low molecular weight novolak resin fraction resulting in significantly improved adhesion and also very high photospeed (therefore the suffix **High Speed**). Meanwhile AZ 1500 HS has proven its superior performance in several production lines and lead to less rework and higher yields.

All AZ 1500-series resists are compatible with all common developers used for positive photoresists, like AZ 351B (diluted 1:4), 0.5% NaOH solution and metal ion free developers like AZ 726 MIF. While AZ 1500-family and AZ 1514H are optimised for best process latitude at 50 - 60 seconds development time, AZ 1500HS-family performs best at 20 - 30 seconds development time resulting in a high throughput lithographic process.

PHYSICAL and CHEMICAL PROPERTIES

AZ	1505	1518	1529	1514H	1512HS	1518HS
Solids content [%]	17.7	29.9	34.0	27.8	26.5	30.4
Viscosity [cSt at 25°C]	6.3	34.2	80.0	24.2	18.0	33.0
Absorptivity [l/g*cm] at 398nm	0.80	1.30	1.36	1.22	1.32	1.50
Solvent	methoxy-propyl acetate (PGMEA)					
Max. water content [%]	0.50					
Spectral sensitivity	310 - 440 nm					
Coating characteristic	striation free					
Filtration [µm absolute]	0.1	0.2	0.1			

FILM THICKNESS [µm] as FUNCTION of SPIN SPEED (characteristically)

spin speed [rpm]	2000	3000	4000	5000	6000
AZ 1505	0.71	0.58	0.50	0.45	0.41
AZ 1512HS	1.70	1.39	1.20	1.07	0.98
AZ 1514H	1.98	1.62	1.40	1.25	1.14
AZ 1518 and AZ 1518HS	2.55	2.08	1.80	1.61	1.47
AZ 1529	4.10	3.35	2.90	2.59	2.37

PROCESSING GUIDELINES

Dilution and edge bead removal	AZ EBR Solvent
Prebake	100°C, 50", hotplate
Exposure	broadband and monochromatic
PEB	not required, optional with monochromatic exposure
Development	AZ 351B, 1:4 (tank, spray) or AZ 726 (puddle)
Postbake	115°C, 50s hotplate or 30 min. oven
Removal	AZ 100 Remover, conc.

HANDLING ADVISES

Consult the **Material Safety Data Sheets** provided by us or your local agent!

This AZ Photoresists are made up with our patented safer solvent PGMEA. They are **flammable liquids** and should be kept away from oxidants, sparks and open flames.

Protect from light and heat and store in sealed original containers between 0°C and 25°C, exceeding this range to -5°C or +30°C for 1 week does not adversely affect the properties.

Shelf life is limited and depends on the resist series. The **expiration date** is printed on the label of every bottle below the batch number and coded as **[year/month/day]**.

AZ Photoresists are compatible with most commercially available wafer processing equipment.

Recommended materials include PTFE, stainless steel and high-density poly-ethylene and -propylene.



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