Innovation
Creativity
Customer-specific solutions

Positive Photoresist for Lift-off AR-P 5300

Photoresists

AR-P 5300 photoresist series for lift-off applications

Sensitive positive-tone resists for the production of evaporation samples

Characterisation

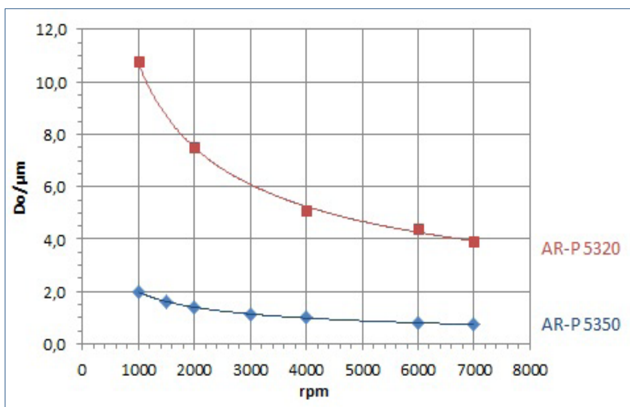
- broadband UV, i-line, g-line
- high photosensitivity, high resolution
- good adhesion properties
- for undercut structures for the production of evaporation samples, in particular of metal using lift-off techniques e.g. for conductor paths
- plasma etching resistant, temperature stable up to 120 °C
- combination of novolac and naphthoquinone diazide
- safer solvent PGMEA

Properties I

Parameter / AR-P	5320	5350
Solids content (%)	39	28
Viscosity 25 °C (mPas)	250	13
Film thickness/ 4000 rpm (µm)	5.0	1.0
Resolution (µm)	2.0	0.5
Contrast	4.0	5.0
Flash point (°C)	42	
Storage temperature (°C)*	10 - 18	

* Products have a guaranteed shelf life of temperatures from the date of sale if stored correctly and can also be used without guarantee until the date indicated on the label.

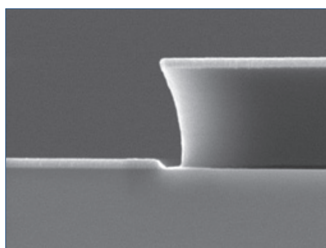
Spin curve



Properties II

Glass transition temperature	108	
Dielectric constant	3.1	
Cauchy coefficients	N_0	1.623
	N_1	166.8
	N_2	10
Plasma etching rates (nm/min)	Ar-sputtering	7
(5 Pa, 240-250 V bias)	O_2	161
	CF_4	39
	80 CF_4 + 16 O_2	90

Lift-off resist structures



AR-P 5350
Lift-off resist structure after metal evaporation

Resist structures

AR-P 5320
Lift-off resist structure after development

Process parameters

Substrate	Si 4“ wafer
Tempering	105 °C, 4 min, hot plate
Exposure	g-line stepper (NA: 0.56)
Development	AR 300-35, 1 : 2, 60 s, 22 °C

Process chemicals

Adhesion promoter	AR 300-80
Developer	AR 300-26, 300-35
Thinner	AR 300-12
Remover	AR 300-76, AR 600-71

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Process conditions

This diagram shows exemplary process steps for AR-P 5300 resists. All specifications are guideline values which have to be adapted to own specific conditions. For further information on processing, ☞ "Detailed instructions for optimum processing of photoresists". For recommendations on waste water treatment and general safety instructions, ☞ "General product information on Allresist photoresists".

Process step	AR-P 5320	AR-P 5350
Coating	6000 rpm, 60 s 4.0 µm	4000 rpm, 60 s 1.0 µm
Tempering (± 1 °C)	105 °C, 4 min hot plate or 100 °C, 40 min convection oven	
UV exposure	Broadband UV, 365 nm, 405 nm, 436 nm Exposure dose (E_0, broadband UV stepper):	
	58 mJ/cm²	55 mJ/cm²
Development (21-23 °C ± 0,5 °C) puddle	AR 300-26, 3 : 2 2 min	AR 300-35, 1 : 2 60 s
Rinse	DI-H_2O, 30 s	
Post-bake (optional)	Not required	
Customer-specific technologies	Generation of e.g. semiconductor properties or lift-off	
Removal	AR 300-76 or O_2 plasma ashing	

Processing instructions

Tempering: Higher tempering temperatures are required to produce the undercut.
Development: The undercut of resist structures is generated during aqueous-alkaline development.

Development recommendations

Resist / Developer	AR 300-26	AR 300-35	AR 300-40
AR-P 5320	2 : 1 to 3 : 2 (1-3 min)	-	-
AR-P 5350	1 : 7	1 : 2	300-47, 2 : 3