



## Thinner for AR resists

### AR 300-12, 600-02, 600-07, 600-09 thinner

For adjusting the film thickness of photoresists and e-beam resists

#### Characterisation

- ultra-filtered, colourless, high-purity organic solvent mixtures
- adjustment of resist film thickness by defined dilution:  
AR 300-12 for photoresists, AR 600-02...09 for e-beam resists
- edge bead removal of coated substrates as well as cleaning of equipment
- AR 300-12: removal of photoresist films tempered at up to 150 °C and of non-tempered e-beam resist films

#### Properties

 safer solvent

Parameter / AR	300-12	600-02	600-07	600-09
Main component	PGMEA	anisole	methoxypropanol	ethyl lactate
Density at 20 °C (g/cm <sup>3</sup> )	0.970	0.990	0.960	1.036
Refractive index at 20 °C	1.402	1.517	1.403	1.413
Water content max. (%)	0.1			
Non-volatiles max. (%)	0.002			
Flash point (°C)	42	44	38	46
Filtration (µm)	0.2			
Suitable for dilution of AR photoresists	3000, 4000, 5000	-	-	-
Suitable for dilution of AR e-beam resists	6510, 7000	632, 642, 662, 672, 6200	617	639, 649, 669, 679
Storage 6 month (°C)	10-22			

#### Application properties

Dilution is performed as follows: 1. placing of defined amount of resist, 2. addition of defined amount of thinner, 3. homogenisation by stirring (both liquids should be mixed quickly), and 4. fine filtration (0.2 µm).

#### Information on dilution

Higher dilutions of resists may cause gel formation of the polymers which leads to particle deposition in the resist film during the coating step. Diluted resists should therefore be subjected to ultra-filtration (0.2 µm) prior to use. In most cases it is more advantageous to adjust the desired film thickness by varying the spin speed or to utilise a pre-adjusted resist. Special adjustments of thickness values are possible on request for an additional charge.

#### Formula for dilutions

Example: Starting with a resist with 35 % solids content (AR-P 3510), a solids content of 31 % is desired. Requested is the amount of thinner AR 300-12 in g which has to be added to 100 g resist with 35 % solids content (mass m in g, solids content c /100).

$$m \text{ thinner} = \frac{m \text{ resist} (c \text{ resist} - c \text{ desired})}{c \text{ desired}} = \frac{100.0 \text{ g} (0.35 - 0.31)}{0.31} = 12.9 \text{ g thinner}$$

If 100.0 g resist (35 % solids content = AR-P 3510) are diluted with 12.9 g thinner in defined manner, 112.9 g diluted resist (31 % solids content = AR-P 3540) will be obtained.

With this dilution, the film thickness is reduced from 2.0 to 1.4 µm at a spin speed of 4000 rpm.