Adhesion Promoter for AR Resists

AR 300-80 new and HMDS adhesion promoter

For improving the adhesive strength of photo and e-beam resists

Characterisation

- improvement of the adhesive strength of photo and e-beam resist films
- especially for surfaces with low adhesion properties, e.g. metal, SiO_2, GaAs
- AR 300-80 new: spin coating of a silicium organic solution = improved adhesion properties and simple, cheaper alternative to HDMS
- HMDS: evaporation of HMDS on the substrate surface (equipment required)

Properties

Parameter / AR	300-80 new	HMDS
Density at 20 °C (g/cm³)	0.971	0.774
Flash point (°C)	7	14
Filtration (µm)	0.2	0.2
Storage temperature (°C)	10-22	

Processing information AR 300-80 (new)

AR 300-80 new is applied by spin coating between 1000 and 6000 rpm. The film thickness can be adjusted by varying the spin speed to the optimum conditions of the respective process.

Higher spin speeds and thus thinner films are preferable, e.g. 4000 rpm with approx. 15 nm thickness. Too high concentrations (film thickness values) may reduce or neutralise the adhesion-promoting effect.

It is recommended for AR 300-80 new to perform the subsequent tempering on a hot plate for 2 min or in a convection oven for 25 min at 180 °C. AR 300-80 new offers the big advantage for sensitive substrates that a bake step at olny 60 °C for the same amount of time is sufficient, even though higher temperatures are well tolerated. The previous AR 300-80 product will only be sold as long as it is in stock.
During tempering, a very uniform, extremely thin layer of adhesion promoter is generated on the substrate (approx. 15 nm). After cooling of the substrate, the resist can be applied as usual.

An excess of adhesion promoter may be rinsed off with organic solvents like e.g. AR 600-70 or AR 600-71. The optimised surface properties are maintained without restriction.

Processing information HMDS

Appropriate equipment is required for the processing of HMDS. For large scale production, hot plates with HMDS vapor deposition are used. If no such equipment is available, the following procedure should be applied:

The pre-treatment should be performed immediately prior to resist coating. Generally, hot plates with integrated HMDS-evaporation are used in the production. If this option is not available, the substrate is placed in a desiccator where HMDS evaporates at room temperature or at temperatures up to 160 °C max. HMDS is under these conditions deposited as monomolecular layer (approx. 5 nm) on the substrate surface.

The treated substrate can be coated with resist immediately after HMDS-deposition without subsequent tempering, or stored in a closed container for a couple of days.

The storage stability may be limited due to an uptake of water from the atmosphere. Storage in open containers should thus be avoided.