TECHNICAL INFORMATION

Futurrex
Productivity Tools

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PROCEDURE TO ESTABLISH LIFT-OFF PROCESS

1. Determination of bake conditions:

If the substrate is a good conductor of heat such as silicon, GaAs, InP etc., this procedure step is unnecessary and bake conditions in Technical Information for the resist should be followed.

If the substrate is a poor conductor of heat, such as glass, place the substrate on a hotplate and record the time needed to bring the substrate surface to the prescribed temperatures for softbake and post-exposure bakes using a thermocouple gauge.

Then add the substrate heat-up time and the bake time prescribed in the Technical Information to obtain the substrate-specific and resist thickness-specific total bake time.

2. Determination of resist development time:

Deposit resist film by spin-coating at prescribed spin speed. Perform softbake only, at conditions determined in paragraph 1, above.

Make several scratches through the entire resist thickness to obtain endpoint detection marks during resist development. Then record the time needed to develop the unexposed resist until the scratch marks disappear.

If the substrate surface is flat, add 10-15 s overdevelopment time to the original time that was needed to clear the resist to obtain the total development time for the resist process. If the substrate surface is not planar, increase the overdevelpment time to facilitate resist development from recessed areas of surface topology.

3. Control of resist sidewall undercut:

Make exposure energy the only variable that dictates the lift-off profile by setting bake conditions and development time constant for a specific film thickness. Then adjust the degree of resist sidewall undercut with exposure energy.

If the critical dimension measured at the top of the printed pattern is equal to the corresponding critical dimension on the printing mask, then the correct exposure dose has been applied and a reproducible resist sidewall undercut will be obtained.

To reduce the degree of resist sidewall undercut, the exposure dose needs to be increased.