OPTICAL LITHOGRAPHY TIPS AND ADVICE

LOCATION: OPTICAL LITHOGRAPHY

PRIMARY TRAINER: Stephanie Bozic (2-6724, sbozic@ualberta.ca)
SECONDARY TRAINER: Jolene Chorzempa (2-4823, jolenec@ualberta.ca)

1. OVERVIEW

► If using a silicon substrate with no metal layer (silicon oxide, silicon nitride, silicon) HMDS must be done prior to spinning photo resist. Consult SOP for YES HMDS Oven.
► The more vacuum grooves on a chuck, the better the support.
► Changing the spread speed will change the thickness of a resist. Faster speeds=thinner; slower speeds=thicker
► Photo resist must be used at room temperature. If it is cold, let it sit for 30min.
► Look closely for where the decimal places are set on the timers.
► Highly thermal conductive substrates (eg. silicon) can be baked on the hotplates. Substrates with low thermal conductivity (eg. glass, borofloat) need to be baked in the oven.
► After baking some photo resists will require a hydration step.
► If the humidity is too high lithography won’t work well and if it’s too low lithography won’t work well. humidity between 40-60% is good.
► Inspect the mask before using. Is it dirty? Are all your features there?
► Mount the mask on the frame chrome side down. (“Brown down”)
► When setting the mask on the mask frame, ensure the substrate chuck is lowered.
► Be sure to inspect your substrates well. Any mistakes will carry through the process and will be harder to correct later on.
► When developing the photo resist, agitation is important. Agitation will reduce developing times.
<table>
<thead>
<tr>
<th>Under Developed</th>
<th>Over Exposed</th>
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<th>Over Developed</th>
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<tbody>
<tr>
<td>-foggy or rainbow colors in areas that are supposed to be clear of resist</td>
<td>-notching on square corners</td>
<td>-foggy or rainbow colors in areas that are supposed to be clear of resist</td>
<td>-rounding of square corners</td>
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<tr>
<td>-bulging in square pits</td>
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<td>-small features &lt;1 micron</td>
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<tr>
<td>-try developing for another couple of seconds</td>
<td>-decrease exposure time for next wafer</td>
<td>-increase exposure time for next wafer</td>
<td>-decrease developing time for next wafer</td>
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