EBL Guidelines

Conditions that affect exposure results

To optimize resolution (smaller patterns):
- Resist thickness: Thin
- Beam current: Small
- Exposure field: Small
- Load substrate/wafer into system at least 30 minutes ahead of starting exposure to ensure temperature and environmental stabilization
- If beam current is changed, allow system to settle at the new beam current for one hour before starting exposure

To optimize speed (shorter exposure times):
- Resist sensitivity: High
- Beam current: Large
- Beam overlapping: Small (low pixel count)
- Exposure field: Large

Stitching and Overlay Errors

<table>
<thead>
<tr>
<th>Field Size</th>
<th>Stitching Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>75 um</td>
<td>&lt; 10 nm</td>
</tr>
<tr>
<td>150 um</td>
<td>&lt; 20 nm</td>
</tr>
<tr>
<td>300 um</td>
<td>&lt; 30 nm</td>
</tr>
<tr>
<td>600 um</td>
<td>&lt; 50 nm</td>
</tr>
<tr>
<td>1.2 mm</td>
<td>&lt; 150 nm (not recommended for small features)</td>
</tr>
</tbody>
</table>

*Note: The 2.4mm field size is not available for our system even though it appears as a choice in the settings

Overlay error: < 30 nm (independent of field size)

General Rules for Pattern Layout
- For target features sizes < 30nm:
  Use line or dot layout tool elements for features and then adjust exposure settings to give desired linewidth. (e.g., draw a line, and then over-expose to get a rectangle of the desired dimension)
- For target feature sizes > 30nm:
  Use the area layout elements (rectangle, etc) to draw features. Adjust exposure to get desired final dimension (e.g., draw a 30nm rectangle and overexpose to result in a 50nm rectangle).