Product Information

Lithography

**Features**
- E-beam patternable
- Negative tone
- Etch resistance
- High purity

**Benefits**
- Direct write
- Thin films
- High resolution
- Excellent line edge roughness
- Aqueous development

**Application Methods**
- Standard spin-on deposition coating equipment.
- Typical spin-coating speeds between 1000 to 5000 rpm’s.
- Hot plate exposure of 150 °C can be used to remove the solvent.

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*Dow Corning® XR-1541 E-Beam Resist*

Hydrogen silsesquioxane electron beam spin-on resist

**Typical Properties**
Specification Writers: Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

<table>
<thead>
<tr>
<th>Property</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal Feature Size</td>
<td>nm</td>
<td>6</td>
</tr>
<tr>
<td>Shelf Life at 5°C</td>
<td>months</td>
<td>6</td>
</tr>
<tr>
<td>Edge Definition</td>
<td>nm</td>
<td>3.3</td>
</tr>
<tr>
<td>Refractive Index</td>
<td>-</td>
<td>1.41</td>
</tr>
<tr>
<td>Trace Metals Impurities</td>
<td>ppb</td>
<td>&lt;10</td>
</tr>
<tr>
<td>Spin-on Film Thickness - 2%</td>
<td>nm</td>
<td>30 - 60</td>
</tr>
<tr>
<td>Spin-on Film Thickness - 4%</td>
<td>nm</td>
<td>55 - 115</td>
</tr>
<tr>
<td>Spin-on Film Thickness - 6%</td>
<td>nm</td>
<td>85 - 180</td>
</tr>
</tbody>
</table>
DESCRIPTION
Dow Corning XR-1541 E-Beam Resists are comprised of hydrogen silsesquioxane (HSQ) resin in a carrier solvent of methylisobutylketone (MIBK). It functions as a negative tone electron-beam resist with capability to define features as small as 6 nm. These resists are processed to high purity semiconductor grade (<10 ppb trace metals). They are available in compositions of resin in carrier solvent to produce thin films ranging in thickness of 30 to 180 nm in a single coat. Customized compositions are available upon request. Formulation with a volatile methyl siloxane (VMS) fluid blend carrier solvent is also available upon request. The VMS blend carrier solvent is exempt from United States federal and state regulations covering volatile organic compounds (VOC).

PROCESSING/CURING
Variable energy electron beam lithography allows control of the electron penetration depth in HSQ from below 35 nm to greater than 175 nm with a single exposure tool with beam energies from 200 eV to 100 keV. Optimal doses depend upon beam energy, desired resolution, and film thickness, but area doses from 400 to 700 µC/cm2 are typical and dependent on thickness. A 350 °C post exposure bake in N2 enhances the contrast properties of the film. Films can then be developed in a standard aqueous base developer (0.26 N TMAH).

PACKAGING
Dow Corning® XR-1541 E-Beam Resists is available in 125-ml, and 250-ml containers as inducements to infringe any patent. Dow Corning’s sole warranty is that the product will meet the Dow Corning sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted. DOW CORNING SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. DOW CORNING DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.

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