WaferBond® HT-10.10 material is an organic coating for high-temperature temporary wafer bonding for MEMS and 3-D wafer-level packaging applications. WaferBond® HT-10.10 material enables thinning and backside standard lithographic processing through effective bonding and subsequent thermal debonding. The material has been developed and tested especially for use in through-silicon via creation, finishing, and redistribution layer completion in processes up to 220°C.

**Benefits**

- Process ultrathin wafers using standard BEOL technique and tooling
- Create interconnects before or after thinning
- Transfer completed thinned wafer to film frame for final testing and dicing

**Solder bumps or posts may be a) captured in bond line before thinning or b) created after backside processing.**

Thinned device may be mounted on film frame for dicing and pick-and-place handling.
Processing

Coating Parameters (20 µm coating on 8-inch wafer)
Processes are available for 50 µm and 100 µm coating.
Spin Speed: 1000 to 2500 rpm
Acceleration: 1000 rpm/s
Spin Time: 30 to 60 s

Hot Plate Bake Process
Proximity Bake:
180°C at 3000 µm for 1 minute
180°C at 1500 µm for 1 minute
180°C at 500 µm for 2 minutes
Contact Bake:
120°C for 2 minutes
180°C for 2 minutes

Bonding Process
Temperature: 180°C
Time: 2 minutes
Vacuum: 5 mbar
Pressure: ~15.5 psi (flat wafers)

Mechanical Debonding Process
EUV® Debonder at 190°C to 220°C
Fast slide-off debonding cycle (< 5 min)

Rheology

Thin Wafer Cleaning Process
Without MegPie Tool
1. Dispense WaferBOND Remover at 1 ml/s with wafer spinning at 900 rpm for 10 s
2. Spin off Remover at 900 rpm for 10 s
3. Repeat steps 1 and 2 thirteen (13) times (total cycles = 14, total time = 280 s
4. Rinse with IPA at center for 30 s at 900 rpm
5. Sweep rinse with isopropyl alcohol (IPA) for 30 s at 900 rpm
6. Spin dry at 2000 rpm for 30 s

With MegPie Tool*
1. Complete steps 1 through 3 above
2. Cover the wafer surface with Remover and clean with MegPie for 3 minutes
3. Rinse with IPA at center for 30 s at 900 rpm
4. Sweep rinse with IPA for 30 s at 900 rpm
5. Spin dry at 2000 rpm for 30 s
* Care must be taken to ensure that no backside contamination results from use of MegPie. With use of WaferBOND Remover, more data is needed to support use of MegPie as some studies suggest MegPie may increase particle counts.

Storage Conditions
Store at room temperature (16°C to 26°C)

Resistance to Process Chemicals

Chemical Resistance Testing with No Degradation

<table>
<thead>
<tr>
<th>Chemistry</th>
<th>Bath Temp.</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetone</td>
<td>25°C</td>
<td>25 min</td>
</tr>
<tr>
<td>NMP</td>
<td>85°C</td>
<td>60 min</td>
</tr>
<tr>
<td>6N HCl</td>
<td>60°C</td>
<td>30 min</td>
</tr>
<tr>
<td>15% H2O2</td>
<td>60°C</td>
<td>40 min</td>
</tr>
<tr>
<td>30% NH4OH</td>
<td>25°C</td>
<td>30 min</td>
</tr>
<tr>
<td>10% KI in H2O</td>
<td>25°C</td>
<td>20 min</td>
</tr>
<tr>
<td>EtOH</td>
<td>25°C</td>
<td>5 min</td>
</tr>
<tr>
<td>MeOH</td>
<td>25°C</td>
<td>5 min</td>
</tr>
<tr>
<td>IPA</td>
<td>25°C</td>
<td>5 min</td>
</tr>
<tr>
<td>Cyclohexanone</td>
<td>25°C</td>
<td>5 min</td>
</tr>
<tr>
<td>Ethyl Lactate</td>
<td>25°C</td>
<td>5 min</td>
</tr>
<tr>
<td>PGMEA</td>
<td>25°C</td>
<td>5 min</td>
</tr>
<tr>
<td>PGME</td>
<td>25°C</td>
<td>5 min</td>
</tr>
<tr>
<td>30% HCl</td>
<td>25°C</td>
<td>90 min</td>
</tr>
<tr>
<td>70% HNO3</td>
<td>25°C</td>
<td>60 min</td>
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</tbody>
</table>

Note: An HMDS pretreatment is recommended for the following exposure recipe:

<table>
<thead>
<tr>
<th></th>
<th>Bath Temp.</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.26N TMAH</td>
<td>60°C</td>
<td>30 min</td>
</tr>
<tr>
<td>30% KOH</td>
<td>85°C</td>
<td>60 min</td>
</tr>
</tbody>
</table>

Please contact your Brewer Science, Inc., representative for process recommendations for thicker coatings of 50 µm and 100 µm, or reach us through the Internet at www.brewerscience.com/contact-us.