



WaferBOND® HT-10.10

Temporary Bonding Material

WaferBOND® HT-10.10 temporary bonding material enables back-end-of-line (BEOL) processing of ultrathin wafers with standard semiconductor equipment.

WaferBOND® HT-10.10 material is an organic coating for 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 techniques and tooling
- Create interconnects before or after thinning
- Protect devices from chemical degradation
- Remove adhesive from device wafer completely

Resistance to Process Chemicals

| Chemistry | Bath Temp. | Time |
|---|------------|--------|
| Acetone | 25°C | 25 min |
| NMP | 85°C | 60 min |
| 6N HCl | 60°C | 30 min |
| 15% H ₂ O ₂ | 60°C | 40 min |
| 30% NH ₄ OH | 25°C | 30 min |
| 10% KI in H ₂ O | 25°C | 20 min |
| Ethanol | 25°C | 5 min |
| Methanol | 25°C | 5 min |
| Isopropanol | 25°C | 5 min |
| Cyclohexanone | 25°C | 5 min |
| Ethyl Lactate | 25°C | 5 min |
| PGMEA | 25°C | 5 min |
| PGME | 25°C | 5 min |
| 30% HCl | 25°C | 90 min |
| 70% HNO ₃ | 25°C | 60 min |
| Note: An HMDS pretreatment is recommended for the following exposure recipes: | | |
| 0.26N TMAH | 60°C | 30 min |
| 30% KOH | 85°C | 60 min |

Contact Brewer Science for process recommendations for different coating thicknesses.

PROCESSING

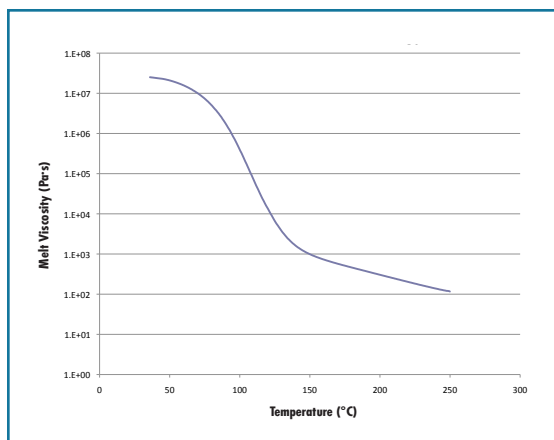
Best known methods (200-mm wafers)

| | 20-μm process | 50-μm process |
|--------------|---------------|---------------|
| Coat | | |
| Spin speed | 1200 rpm | 450 rpm |
| Acceleration | 3000 rpm/s | 500 rpm/s |
| Time | 30 s | 35 s |
| Bake | | |
| Bake 1 | 120°C, 3 min | 120°C, 5 min |
| Bake 2 | 180°C, 4 min | 180°C, 6 min |
| Bond | | |
| Temperature | 180°C | 170°C |
| Force | 3500 N | 2100 N |
| Time | 2 min | 1 min |
| Vacuum | ≤ 5 mbar | ≤ 5 mbar |

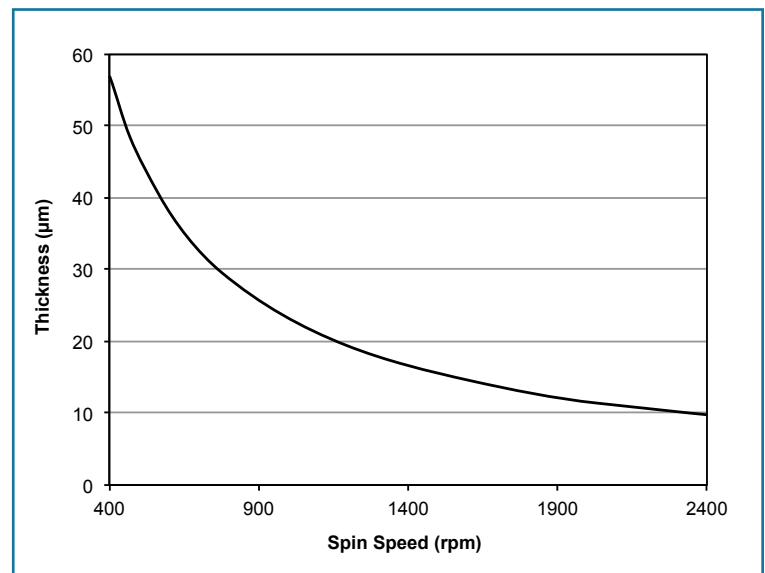
Storage Conditions

Store at room temperature (16 to 26°C)

WaferBOND® HT-10.10 Material Melt Rheology



Spin Speed Curve



Thermal Slide Debonding

Temperature: 190°C

Max Rate: 3 mm/s

Max Force: 3 lb

Thin Wafer Cleaning Process

| Clean – Central or Spray Dispense | | | | |
|-----------------------------------|--|----------------------|----------|----------|
| Step | Speed (rpm) | Acceleration (rmp/s) | Time (s) | Dispense |
| 1 | 1000 | 3000 | 10 | WBR |
| 2 | 1000 | 3000 | 10 | — |
| 3 | Repeat steps 1 & 2 five to thirteen times* | | | |
| 4 | 1000 | 3000 | 20 | IPA |
| 5 | 1000 | 3000 | 30 | — |

*Dependent on thickness and equipment

WBR – WaferBOND® Remover material

IPA – Isopropyl alcohol

Viscosity (Brookfield) at 100°F (37.8°C)

WaferBOND® HT-10.10 material: 1020 cP

Viscosity (Brookfield) at Room Temperature (25°C)

WaferBOND® HT-10.10 material: 1840 cP

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Effective Date: 3/13/2017