Brewer Science® WaferBOND® HT-10.10

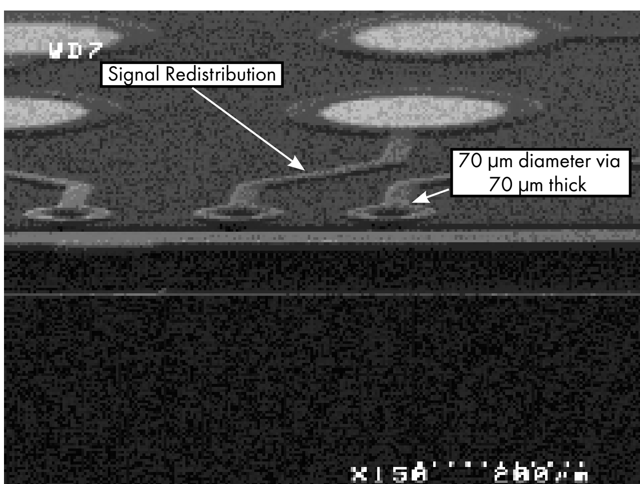
Temporary Wafer Bonding Material

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

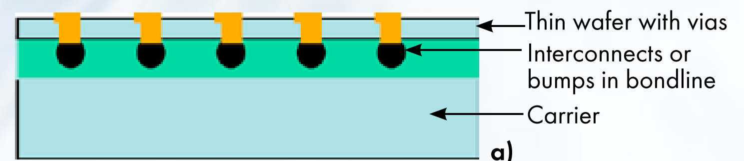
WaferBond® HT-10.10 material is an organic coating for high-temperature temporary wafer bonding for MEMS and 3-D wafer-level packaging applications. WaferBOND® HT-10.10 material enables thinning and backside standard lithographic processing through effective bonding and subsequent thermal debonding. 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.

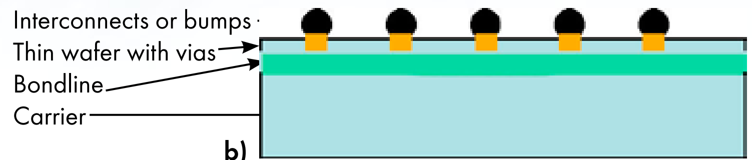
Benefits

- 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

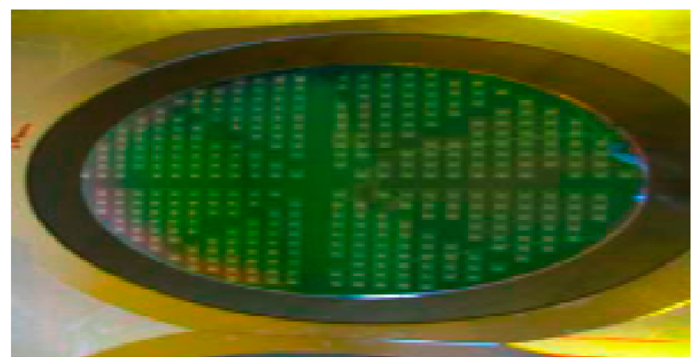


70-µm thick wafer, 1:1-aspect-ratio vias, copper redistribution layer





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)

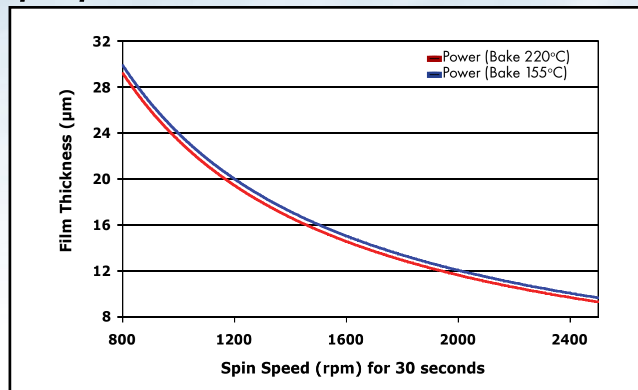
Processes are available for 50 µm and 100 µm coating.

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
- or -
Contact Bake:
120 °C for 2 minutes
180 °C for 2 minutes

Spin Speed Curve



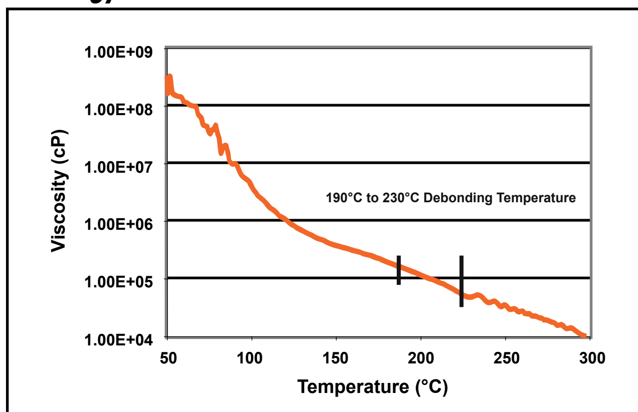
Bonding Process

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

Mechanical Debonding Process

EVG® 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 step 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 insure 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

Chemistry	Bath Temp.	Time
Acetone	25 °C	25 min
NMP	85 °C	60 min
6N HCl	60 °C	30 min
15% H_2O_2	60 °C	40 min
30% NH_4OH	25 °C	30 min
10% KI in H_2O	25 °C	20 min
EtOH	25 °C	5 min
MeOH	25 °C	5 min
IPA	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 recomended for the following exposure recipe:

Chemistry	Bath Temp.	Time
0.26N TMAH	60 °C	30 min
30% KOH	85 °C	60 min

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.

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