VertaBond™

High-Volume Automated Vacuum Anneal System for WtW Hybrid Bonding, DtP & PtP Bonding

The YES VertaBond™ is a production-proven automated vacuum anneal system equipped with uniform temperature control and laminar gas flow. This system has an EFEM integrated with two process modules that can accommodate 200 mm and 300 mm wafers, or panel sizes ranging from 400 mm to 550 mm. The VertaBond wafer systems can process batch sizes of 50 wafers (one PM) or 100 wafers (two PMs). VertaBond panel systems can process batch sizes of 12 panels (one PM) or 24 panels (two PMs).

The Vacuum Cure Advantage

- Void-free hybrid bonding in less time and at lower temperatures using vacuum
- Vacuum anneal provides Cu-Cu bonding without voids, delamination or dishing
- Laminar flow reduces/eliminates particles
- Bonding strength increases 3-4.5x under vacuum at temperatures as low as 200°C or 300°C compared to atmospheric anneal
- Vacuum anneal enables 6 µm pitch with no voids or bubbles
- Less film stress and low wafer warpage

COMMON APPLICATIONS

3D packaging
CMOS image sensors under panel
Polyimide bake
Copper anneal
Wafer to wafer bonding anneal
DtP and PtP bonding

Contact Us: We offer process demonstrations. If you would like to submit samples, please call us. We can run your samples and provide a detailed process report.

Yield Engineering Systems, Inc.

Call: **1-510-954-6889** (worldwide) or **1-888-YES-3637** (US toll free)

www.yieldengineering.com

VertaBond™

300 MM SYSTEM SPECIFICATIONS

	DESCRIPTION	SPECIFICATION
SYSTEM / PROCESS	Environment Cleanliness	Class 1 (ISO 3)
	EFEM Cleanliness	Class 1 (ISO 3)
	Max Temp	450˚C
	WiW Temp Uniformity	≥ 250˚C ± 2.5˚C at dwell after temperature stabilization ≤ 250˚C ± 1.5˚C at dwell after temperature stabilization
	WtW Temp Uniformity	± 2.5˚C at dwell after temperature stabilization
	Ramp-rate	Maximum 8.0˚C/min from 150˚C to 350˚C (slope)
	Ramp-down	Maximum 4.0˚C/min from 350˚C to 150˚C (slope)
	Up-time	≥ 95%
	MTTR	≤ 4 hours
	Warpage	≤ 3 mm one side
	Process Pressure	Sub-atmospheric and atmospheric pressures
	Process Recipe	YES BKM recipe: one-step process
	System Footprint	6.5 m^2 (EFEM and one process module); 10.7 m^2 (EFEM and two process modules)
HARDWARE	Wafer Size	300 mm
	Load Port Quantity	2 or 4
	Process Gas Type	N_2 gas (preheated) - Process grade N_2 preferred
	MFC	N_2 calibrated MFC
	N_2 Flow	20 – 200 SLM
	Pump	Purchasable option (process-dependent)
	Standard Cooling	Forced air cooling outside of chamber
	Pump Exhaust	Scrubber-max flow 21 CFM (provided by customer)
	Aligner	Purchasable option
	Safety Compliance	SEMI S2 and S8, CE and NFPA79 compliance
	Chamber Material	Stainless steel chamber 316L
	Process Capability	One process module for 50 wafers, Two process modules for 100 wafers
	O_2 Concentration	<10 ppm
	Warranty	12 months after acceptance

SOFTWARE	SEMI Equipment Communication Standard 2 Message Content (SECS II)	SEMI E5
	Generic Model for Communications and Control of SEMI Equipment (GEM)	SEMI E30
	High-Speed SECS Message Services Generic Services (HSMS)	SEMI E37
	High-Speed SECS Message Services Single-Session Mode (HSMS-SS)	SEMI E37.1
	Standard for Carrier Management (CMS)	SEMI E87
	Specification for Enhanced Carrier Handoff Parallel I/O Interface	SEMI E84
	Specification for Substrate Tracking (STS)	SEMI E90
	Specification for Process Job Management (PJM)	SEMI E40
	Specification for Control Job Management (CJM)	SEMI E94
	Operating System	Windows 10

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200/300 MM BRIDGE SYSTEM SPECIFICATIONS

	DESCRIPTION	SPECIFICATION
SYSTEM / PROCESS	Environment Cleanliness	Class 1 (ISO 3)
	EFEM Cleanliness	Class 1 (ISO 3)
	Max Temp	450˚C
	WiW Temp Uniformity	200 mm: ± 2.0˚C at dwell after temperature stabilization 300 mm: ± 3.0˚C at dwell after temperature stabilization
	WtW Temp Uniformity	± 2.5˚C at dwell after temperature stabilization
	Ramp-rate	Maximum 4.0˚C/min from 100˚C to 350˚C (slope)
	Ramp-down	Maximum 3.0˚C/min from 350˚C to 100˚C (slope)
	Up-time	≥ 95%
	MTTR	≤ 4 hours
	Warpage	≤ 3 mm one side
	Process Pressure	Sub-atmospheric and atmospheric pressures
	Process Recipe	YES BKM recipe: one-step process
	System Footprint	6.5 m^2 (EFEM and one process module); 10.7 m^2 (EFEM and two process modules)
HARDWARE	Wafer Size	200 mm and 300 mm
	Load Port Quantity	2 or 4
	Process Gas Type	N_2 gas (preheated) – Process grade N_2 preferred
	MFC	N_2 calibrated MFC
	N_2 Flow	50 – 200 SLM
	Pump	Purchasable option (process-dependent)
	Standard Cooling	Forced air cooling outside of chamber
	Pump Exhaust	Scrubber-max flow 21 CFM (provided by customer)
	Aligner	Purchasable option
	Safety Compliance	SEMI S2 and S8 compliance
	Chamber Material	Stainless steel chamber 316L
	Process Capability	One process module for 50 wafers, Two process modules for 100 wafers
	O_2 Concentration	<10 ppm
	Warranty	12 months after acceptance
SOFTWARE	SEMI Equipment Communication Standard 2 Message Content (SECS II)	SEMI E5
	Generic Model for Communications and Control of SEMI Equipment (GEM)	SEMI E30
	High-Speed SECS Message Services Generic Services (HSMS)	SEMI E37
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