SB6/8 GEN2

SEMI-AUTOMATED PERMANENT WAFER BONDER

SB6/8 GEN2 SOLUTIONS	
Features	+ Precise process recipe control for all bond parameters + Precision temperature control and unrivaled uniformity + Fast heating and active cooling to reduce process cycle times + Bond force up to 20 kN + Temperature up to 550 °C + Pressure range in bond chamber from 5x10-5 mbar to 3 bar abs. + Ergonomic and contamination-free wafer loading
Process Flexibility	+ Designed for all types of bond processes and bond applications + Anodic Bonding + Thermo-compression Bonding + Eutectic Bonding + Glass Frit Bonding + Fusion Bonding + Adhesive Bonding + Temporary Bonding

UNIVERSAL WAFER BONDER - FROM R&D TO VOLUME PRODUCTION+

The semi-automated SB6/8 Gen2 is SUSS MicroTec's state-of-the-art universal wafer bonding system that handles wafers up to 200 mm and supports various substrate types and sizes. Variable configurations provide a wide range of temperature, bond forces and chamber pressure thus supporting all types of bond processes.

Flexible tooling allows for adapting to changing process requirements in the semiconductor industry. Major applications are in MEMS and LED packaging and production and 3D stacking.

With its process versatility the SB6/8 Gen2 is used in R&D providing an easy switch to volume production. In all scopes of application the SB6/8 Gen2 stands for superior process stability and high throughput capability.

OPTIMAL PROCESS PARAMETERS

Flexibility in the choice of processes makes the SB6/8 Gen2 a superior tool for many applications. With its wide bandwidth of process parameters the platform creates an ideal environment for all kinds of bond technologies. It supports low force for adhesive bonding as well as high force for thermo compression or eutectic bonding and offers various chamber pressure conditions from vacuum to over pressure. The SB6/8 Gen2 provides an excellent temperature uniformity, high temperature repeatability and a temperature range of up to 550 °C. In addition, an intuitive graphical user interface and recipe editor recipe facilitate all possible process procedures.

ADVANCED PROCESS CONTROL

The SB6/8 Gen2 software design offers productivity features such as different user access levels, automatic recipe checking, programmable force- and temperature ramps as well as advanced data logging. The tool also allows fully manual processing in research and development applications. Multiple events can be triggered during the same recipe step, such as pump down and heating up, granting superior process flexibility.

SAFE WAFER LOADING

The SB6/8 Gen2 provides comprehensive safety on the operator and equipment side: an automated wafer loading system with motorized z-axis protects the operator from direct contact with hot surfaces and pinch points. The closed chamber design of the SB6/8 Gen2 uses a gate valve for fixture loading and prevents particles from entering into the chamber by keeping the inside pressure at slightly above ambient pressure when the gate valve is open.

BOND TOOLING OPTIONS

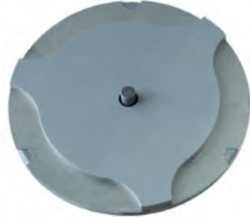
The SB6/8 Gen2 provides a selection of different toolings for various applications and wafer sizes. The tooling can be exchanged quickly and easily enabling simple change-over between different applications.

Material handling unit for ergonomic and contamination-free wafer loading

SEMI-AUTOMATED PERMANENT WAFER BONDER

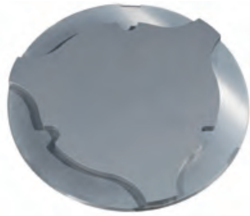
BOND TOOLING OPTIONS

BOND HEAD WITH CENTER PIN



The bond head includes a center pin which allows to establish contact between both wafers at their center point. This helps to maintain excellent alignment even after thermal expansion of the bond partners. The center pin allows an anodic prebond to maintain the alignment of the wafers. It is also used to initiate a fusion bond in the center of the wafer stack.

BOND HEAD WITHOUT CENTER PIN



The bond head offers excellent temperature and and bond force uniformity and maintains excellent post-bond alignment in combination with SUSS' proprietary sequential spacer removal technology. This bond head and tooling design enable optimum yield due to minimal exclusion zones.

OPEN FIXTURES

The open fixture features a transport ring with minimum contact area for wafer support and maximized cut-out area for reduced thermal mass during heat up and cool down. This type of fixture allows direct contact between the wafers and the sandwich and pressure plate which results in optimum temperature uniformity across the wafers. In addition, this enables optimal heating and cooling rates and is therefore the best choice for high throughput applications.

CLOSED FIXTURES

Featuring a transport ring with an integrated SiC tooling plate closed fixtures are designed for handling irregular substrate shapes as well sensitive material such as lithium tantalite. The closed fixture is ideal for fragile substrates like MEMS and optical devices as the wafers are fully supported and protected during handling.

MULTI-BOND FIXTURES

The multi-bond fixture is used in combination with a special loading and mechanical alignment system and supports multi-wafer bonding and multiple wafer sizes at the same time. Bonding multiple wafers in the same bond cycle allows to maximize the overall system throughput.

TECHNICAL DATA

GENERAL FEATURES	
Substrate Size	From pieces up to 150 mm wafers: SB6 Gen2 From pieces up to 200 mm wafers: SB8 Gen2
TEMPERATURE MANAGEMENT	
Heater Design	Independent resistive SiN top- and bottom heater with active air cooling
Maximum Temperature	up to 550 °C
Temperature Uniformity	± 1.5 %
Temperature Repeatability	± 3 °C
Maximum Heating Rate	Up to 30 K/min (with ramping function)
Maximum Cooling Rate	Up to 25 K/min
BOND FORCE	
Maximum Bond Force	20 kN
Bond Force Repeatability	± 2 %
GRAPHICAL USER INTERFACE	
MS Windows based operating system	
Unlimited Storage of Recipes (limited by hard disk size)	
Flat Panel Display with Keyboard and Trackball	
PROCESS CHAMBER	
Minimum Pressure	5×10^{-5} mbar after 5 min pump-down
Maximum Pressure	2 bar overpressure (3 bar absolute)
Chamber Design	Electro-polished class 1 stainless steel bond chamber with gate valve
MEDIA SUPPLY	
Vacuum	<100 mbar absolute
Compressed Air	6-10 bar (CDA)
Nitrogen	7-7.5 bar
Power Requirements	208 – 230 VAC, 50/60 Hz; 25 A; 4200 W
Exhaust	10.6 cfm
PHYSICAL DIMENSIONS	
Height x Width x Depth	1200 mm / 625 mm / 1400 mm
Weight	340 kg

Data, design and specification depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously. Illustrations, photos and specifications in this brochure are not legally binding. SUSS MicroTec reserves the right to change machine specifications without prior notice.

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