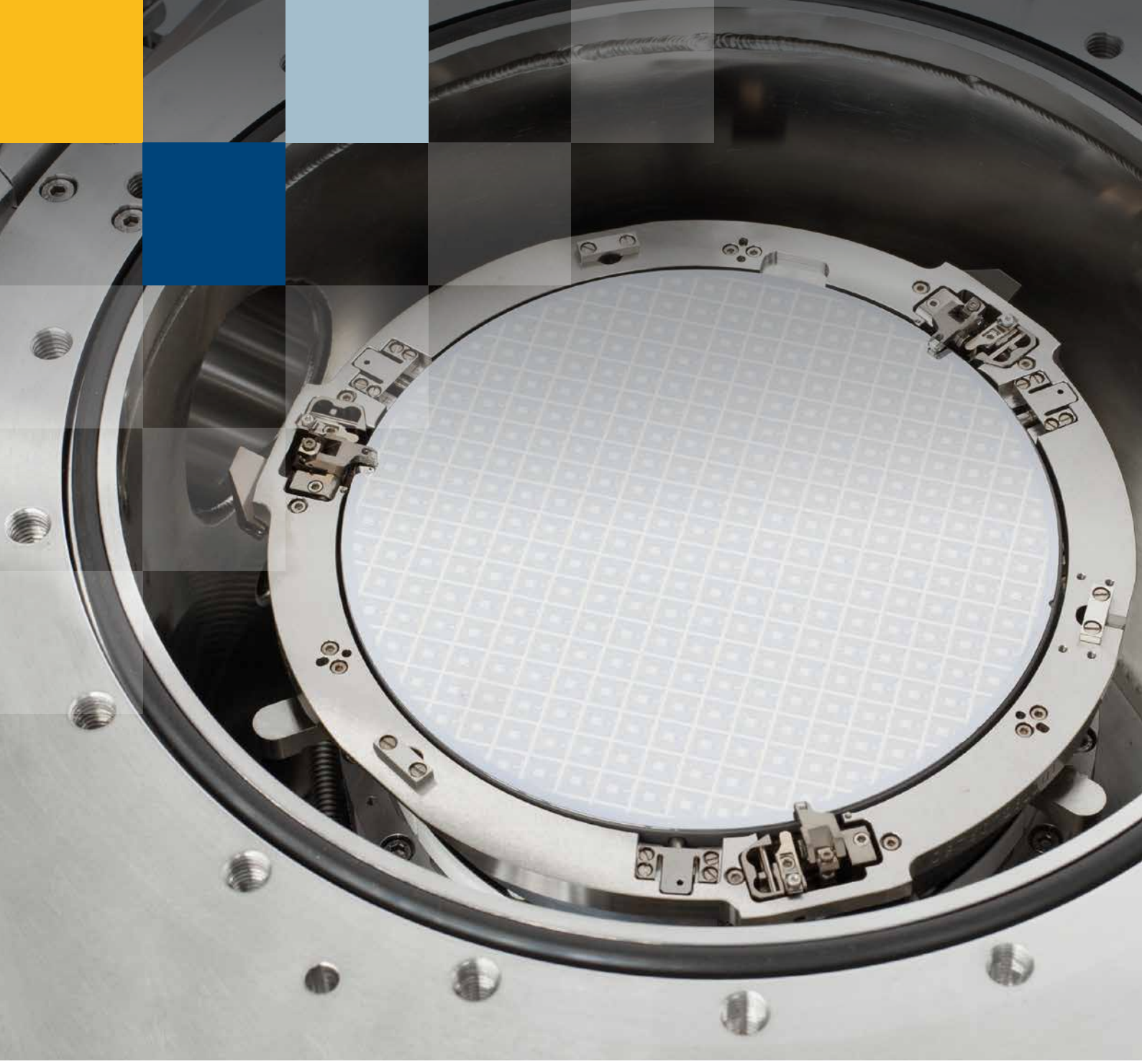
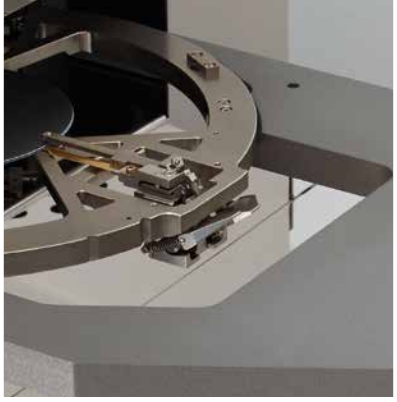


SEMI-AUTOMATED PERMANENT WAFER BONDER

SUSS SB6/8 Gen2

UNIVERSAL WAFER BONDER – FROM R&D TO VOLUME PRODUCTION

SÜSS MicroTec


SUSS SB6/8 Gen2

UNIVERSAL WAFER BONDER

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 machine configurations are serving all kinds of different process requirements and cost of ownership demands.

Flexible tooling allows the quick adaption 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 permits an easy switch from R&D to pilot production and finally volume manufacturing. 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 adhesive bonding as well as thermo compression, fusion and eutectic bonding and the novel Impulse Current Bonding (ICB) process. The chamber pressure conditions can be controlled from vacuum to overpressure. The SB6/8 Gen2 enables bonding temperature up to 550°C by maintaining excellent temperature uniformity and repeatability. In addition, an intuitive graphical user interface and recipe editor 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.

HIGHLIGHTS

+ Precise process recipe control for all bond parameters
+ Precision temperature control and unrivaled uniformity
+ Impulse Current Bonding (ICB) for low temperature permanent bonding
+ Bond force up to 20 kN and temperature up to 550 °C
+ Pressure range in bond chamber from 5×10^{-5} mbar to 3 bar abs.
+ Ergonomic and contamination-free wafer loading

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

FOR FLEXIBLE CONFIGURATION POSSIBILITIES

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

BONDHEAD EITHER WITH OR WITHOUT CENTER PIN

The bond head without center pin offers ideal temperature and bond force uniformity. Combined with SUSS MicroTec's proprietary sequential spacer removal technology, it maintains excellent post-bond alignment. The bond head including a center pin establishes contact between wafers at their center point. This helps to maintain excellent alignment even after thermal expansion of the bond partners and is used to initiate a fusion bond in the center of the wafer stack.

TEMPORARY BOND TOOLING

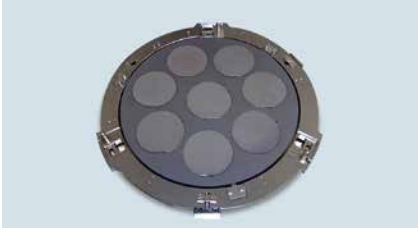
The tooling enables temporary bonding especially for R&D and small-volume production for wafers up to 200 mm. The design of the spacer and guiding mechanics allow adjustment to different wafer sizes as well as the combination of different wafer sizes, e.g. oversize carrier wafers. In combination with a particular pressure plate, the tooling covers nearly 100 % of the wafer surface and thus guarantees best possible post bond uniformity and results in the following wafer processing.

OPEN FIXTURES

The open fixture features a transport ring with minimum contact area for wafer support and maximized contact between the wafer and tooling plates. Its low thermal mass ensures minimum cooling time after unloading the fixture from the bond chamber. This type of fixture allows direct contact between the wafers and the lower and upper tooling 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. Wafers are fully supported and protected during handling. Closed fixtures are therefore ideal for handling irregular substrate shapes as well as fragile and sensitive material such as lithium tantalate.



MULTI-BOND FIXTURES

The multi-bond fixture is used in combination with a special loading and mechanical alignment system supporting multi-wafer bonding as well as multiple wafer sizes at the same time. This allows to maximize the overall system throughput.

Designed for all types of bond processes and bond applications

+ Anodic Bonding
+ Impulse Current Bonding (ICB)
+ Thermo-compression Bonding
+ Eutectic Bonding
+ Glass Frit Bonding
+ Fusion Bonding
+ Adhesive Bonding
+ Temporary Bonding

SEMI-AUTOMATED PERMANENT WAFER BONDER

SUSS SB6/8 Gen2

TECHNICAL DATA

GENERAL FEATURES	
Substrate Size	SB6 Gen2: From pieces up to 150 mm wafers SB8 Gen2: From pieces up to 200 mm wafers
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 (with ramping function)
BOND FORCE	
Maximum Bond Force	20 kN
Bond Force Repeatability	± 2 %
GRAPHICAL USER INTERFACE	
MS Windows based operating system	
Unlimited storage of recipes	
Flat panel display with keyboard and trackball	

PROCESS CHAMBER	
Minimum Pressure	5 x 10^{-6} 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	380 - 400 VAC / 20 A / 50 HZ 200 - 208 VAC / 25 A / 50 / 60 HZ
Exhaust	10.6 cfm
PHYSICAL DIMENSIONS	
Height x Width x Depth	1600 mm x 1200 mm 627 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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