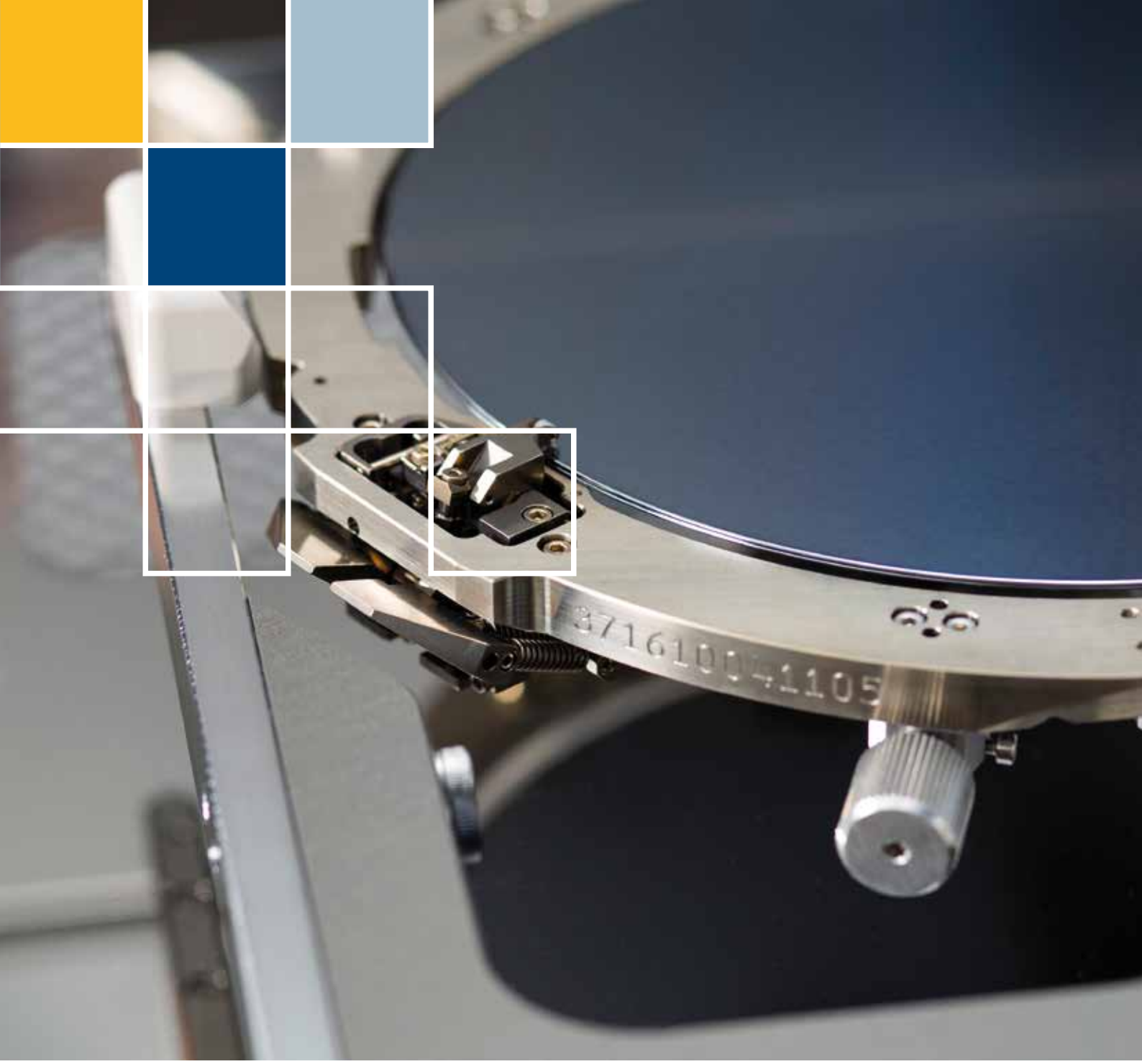

SEMI-AUTOMATED WAFER BONDER PLATFORM

SUSS XB8

UNIVERSAL HIGH-FORCE WAFER BONDER - FROM R&D TO VOLUME PRODUCTION

SÜSS MicroTec

SEMI-AUTOMATED WAFER BODNER

SUSS XB8
UNIVERSAL HIGH-FORCE WAFER BONDER

The XB8 wafer bonder is designed for a wide range of bonding processes and supports substrates with a wafer size of up to 200 mm. All process parameters can be adapted flexibly according to the requirements, which makes the system perfect for use in research and development. In production, the high level of automation and the sophisticated design of the XB8 ensure a high level of process stability. This makes the XB8 wafer bonder ideal for applications from the MEMS, advanced packaging, 3D integration and LED fields.

Flexibility in process development

The XB8 wafer bonder offers an extremely large parameter window and is therefore suitable for carrying out all standard bonding processes. Bond force options of 60 kN and 100 kN are available and a temperature range of up to 550 °C is covered. An easy-to-use software enables parameters to be set quickly. Ramp functions also enable the process to be adapted optimally to special bonding requirements. Different substrate forms and wafer sizes are processed in specially adapted fixtures. A multi-bond fixture, for example, enables the maximum possible throughput increase by bonding up to eight wafers at once. With its variable usage options the XB8 wafer bonder is the right choice for process development

Process stability through high repeat accuracy

Reproducible process results from wafer to wafer are essential for achieving a consistently high product quality. The XB8 wafer bonder has a closed process chamber with an automatic loading function. During loading, the chamber is flooded with nitrogen to ensure the best possible level of cleanliness. The high level of automation minimizes the influence the operator has on the process result. The thermal decoupling of the heater from the actual bonding chamber enables a process temperature which can be reproduced precisely, combined with an optimal repeat accuracy of the bonding force. The independence from the operator and the sophisticated design of the XB8 wafer bonder guarantee a consistent high process stability and an optimal process result.

XB8 HIGHLIGHTS

+ Bond force up to 100 kN and temperature up to 550 °C
+ Excellent bond force and temperature uniformity
+ Chamber pressure from 5×10^{-5} mbar to 3 bar absolute
+ Various tooling options to cover a wide range of applications
+ Fast heating and active cooling for high throughput
+ High degree of automation to minimize operator intervention

Designed for all types of bond processes and bond applications

+ *Metal Diffusion Bonding*
+ *Eutectic and SLID Bonding*
+ *Hybrid and Fusion Bonding*
+ *Glass Frit Bonding*
+ *Adhesive Bonding*
+ *Anodic Bonding*
+ *Temporary Bonding*

HIGH YIELD DUE TO THE HOMOGENEITY OF THE TEMPERATURE AND BONDING FORCE DISTRIBUTION

In addition to the reproducibility of the bonding process from wafer to wafer, a homogeneous process result across the wafer is essential for achieving a high yield. The thermally decoupled ceramic heaters guarantee an even temperature distribution and also ensure an optimal bonding force homogeneity within the entire temperature range. An optionally available multi-zone heating system enables advanced control of the temperature distribution. With the XB8, the bonding force is captured via a construction consisting of three pillars, which is decoupled from the vacuum chamber. There are also bonding force zones for 4", 6" and 8" wafers. This innovative, mechanical and thermal structure of the XB8 wafer bonder enables optimal bonding force and temperature distribution across the wafer, resulting in a high yield.

BOND TOOLING OPTIONS

FOR FLEXIBLE CONFIGURATION POSSIBILITIES

CENTER PIN TOOLING OPTION

This tooling option can be used with the open- and closed fixture and allows fusion bonding in a controlled atmosphere. It can also help in achieving the best possible post-bond alignement by holding the wafers in place during pump down and spacer flag removal. The center pin can be preloaded with a recipe programmable bond force in order to ensure uniform bond results.

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 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 as sensitive material such as lithium tantalate. 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.

SUSS XB8

TECHNICAL DATA

GENERAL FEATURES	
Substrate Size	4", 6", 8" wafers dedicated tooling for pieces
TEMPERATURE MANAGEMENT	
Heater Design	Independent resistive ceramic heaters with active cooling and optional multi-zone heaters
Maximum Temperature	up to 550 °C
Temperature Uniformity	< 1.5 %
Temperature Repeatability	± 3 °C
Maximum Heating Rate	Up to 40 K/min
Maximum Cooling Rate	Up to 40 K/min
BOND FORCE	
Maximum Bond Force	60 kN or 100 kN Bond force zones for 4", 6" and 8" wafers
Bond Force Repeatability	< ± 2 %
GRAPHICAL USER INTERFACE	
	MS Windows based operating system
	Unlimited Storage of Recipes
	Flat Panel Display with Pointing Device
PROCESS CHAMBER	
Minimum Pressure	5 x 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	6-7 bar (CDA)
Nitrogen	5-6 bar
Power Requirements	208/400 VAC, 60/50 Hz; 50/30 A; 4200 W
Exhaust	600 SLPM
PHYSICAL DIMENSIONS	
Height x Width x Depth	1469 mm x 778 mm x 1710 mm
Weight	700 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.

Visit **www.suss.com/locations**
for your nearest SUSS representative or contact us:
SÜSS MicroTec SE
+49 89 32007-0 · info@suss.com

WWW.SUSS.COM

SÜSS MicroTec

XB8 · 10/2017 · DS_XB8_2017 · V1