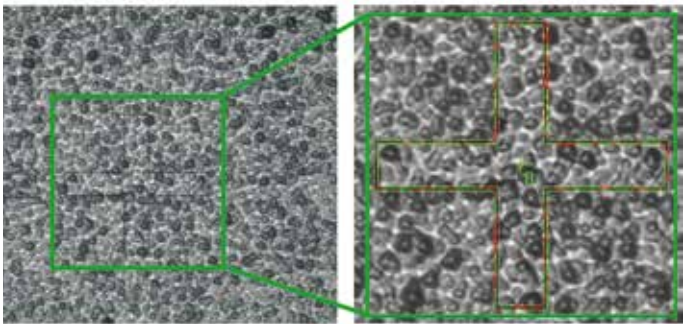
BA8 GEN4 *PRO*

HIGH PRECISION BOND ALIGNER

BA8 GEN4 PRO SOLUTIONS	
Versatility	Configurable alignment technologies + Top-side alignment + Bottom-side alignment + Infrared alignment
Repeatability	Various operation modes for specific process requirements + Manual alignment + Auto alignment + Assisted alignment + Direct alignment
Precision	Improved alignment accuracy + SUSS mask aligner technology + Wedge error compensation + Functional fixture design

HIGH PRECISION BOND ALIGNMENT AND DIRECT BONDING+

The BA8 Gen4 *Pro* bond alignment platform is designed for demanding processes in MEMS and LED production and advanced packaging markets. It accurately aligns substrates and secures their position in fixtures for further process steps. The bond alignment of two wafers is based on the same powerful technology that has proven its value with SUSS MicroTec's mask aligners for mask to wafer alignment. The platform can be configured as a bond aligner only or as a combination of mask and bond aligner. A direct bonding toolkit offers extra functionality for pre-bonding substrates. In order to enhance direct bonding processes, the BA8 Gen4 *Pro* can be equipped with an optional toolkit for selective and full-wafer surface activation. It can easily be upgraded with additional functions within a short time. The system handles substrates up to 200 mm in size. With its ergonomic operation and intuitive user interface, the BA8 Gen4 *Pro* is easy to work with and requires only minimal operator training. Its high degree of automation allows for easy operation and an application in labs, research and development as well as small series production.



Blurred wafer target detected by SUSS pattern recognition software

VERSATILITY THROUGH SOPHISTICATED ALIGNMENT TECHNOLOGIES

The BA8 Gen4 *Pro* incorporates an intelligent design to achieve high alignment accuracy. SUSS MicroTec's unique wedge error compensation system guarantees highest possible planarity between wafers. A selection of alignment technologies configurable to specific needs makes the BA8 Gen4 *Pro* ideal for a wide range of processes and applications.

Top-Side Alignment:

The BA8 Gen4 *Pro* can be optionally equipped with either a manual or motorized top-side alignment system which can reach an alignment accuracy down to 0.25 µm, supported by direct alignment.

Bottom-Side Alignment (BSA):

The BA8 Gen4 *Pro* is equipped with bright-field bottom-side microscopes that include an optical magnification switch and facilitate an alignment accuracy of 1 µm. The BSA microscope with single-field and split-field features uses high resolution CCD cameras. The unique image storage and real-time image processing is more precise and faster than common crosshair alignment.

Infrared Alignment

Infrared alignment allows for the processing of opaque, yet IR-transparent materials such as GaAs, InP, silicon or adhesives, as used for thin-wafer handling or encapsulation applications. The BA8 Gen4 *Pro* can optionally be equipped with a toolset for either transmissive or reflective IR.

HIGH PRECISION BOND ALIGNER

REPEATABILITY THROUGH ENHANCED ALIGNMENT MODES

The BA8 Gen4 *Pro* offers various operation modes for specific process requirements. Automated alignment achieves the highest grade of repeatability.

Manual and Assisted Alignment

Manual alignment uses either a manual or motorized alignment stage that is precisely operated via micrometer screws or joystick. During assisted alignment, the COGNEX®-based pattern recognition software continuously measures and reports accuracy results to the operator. The fiducials are displayed on a screen.

Auto Alignment

Auto alignment is based on a motorized alignment stage. The COGNEX®-based pattern recognition software automatically detects wafer target locations and controls the movement of the alignment stage. Auto alignment couples highest repeatability of process results with optimized throughput and a minimum of operator intervention.

DirectAlign®

As an optional feature, SUSS MicroTec's DirectAlign software enhances the performance of its standard auto alignment using live pattern imaging without interposition of an image storage system, even if process gaps are large. Top-side alignment with DirectAlign achieves an alignment accuracy of 0.25 µm offering the highest precision results for mask aligners on the market.

PRECISION THROUGH FUNCTIONAL FIXTURE DESIGN

The BA8 Gen4 *Pro* offers a variety of bond fixtures. The symmetric fixture design developed by SUSS MicroTec reduces changes in the wafer position, resulting in significant improvement of alignment accuracy.

GenIV fixture in a symmetric open ring design

TECHNICAL DATA	
SUBSTRATES	
Wafer size	Up to 200 mm
Square substrate size	Up to 200 x 200 mm
CONFIGURATIONS	
Bond alignment	Standard
Direct pre-bonding	Optional pre-bonding toolkit
Plasma activation	Optional SELECT toolkit
Mask alignment	Optional mask aligner toolkit
ALIGNMENT	
Process Technologies	Top-side, bottom-side, infrared alignment
Alignment accuracy	Top-side alignment: 0.25 µm Bottom-side alignment:1 µm
ALIGNMENT STAGE	
Travel range X	±3 mm
Travel range Y	±3 mm
Travel range Theta	±3°
WAFER BONDING	
Process technologies	Fusion pre-bonding, plasma activation
GRAPHICAL USER INTERFACE	
Operating system	Windows 7
Programs	Unlimited number of recipes
Operation	Remote access possible
UTILITIES, DIMENSIONS	
Vacuum	< 0.8 bar
Compressed Air	8 bar (116 psi)
Nitrogen	3 bar
POWER REQUIREMENTS	
Power	Voltage AC 230 V
DIMENSIONS	
Width x depth	1350 x 1000 mm = 1.35 sqm
Height	1803 mm incl. top-side microscopes
OPERATOR SAFETY AND ERGONOMICS	
SEMI certificates	S2, S8
EMC	compliant
CE	compliant

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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