

Mask Aligners

Spin Coaters

Substrate Bonders

Flip Chip Bonders

Probe Systems

MASK ALIGNER
MA 1006/1008 TSA/BSA

www.suss.com

SÜSS MicroTec



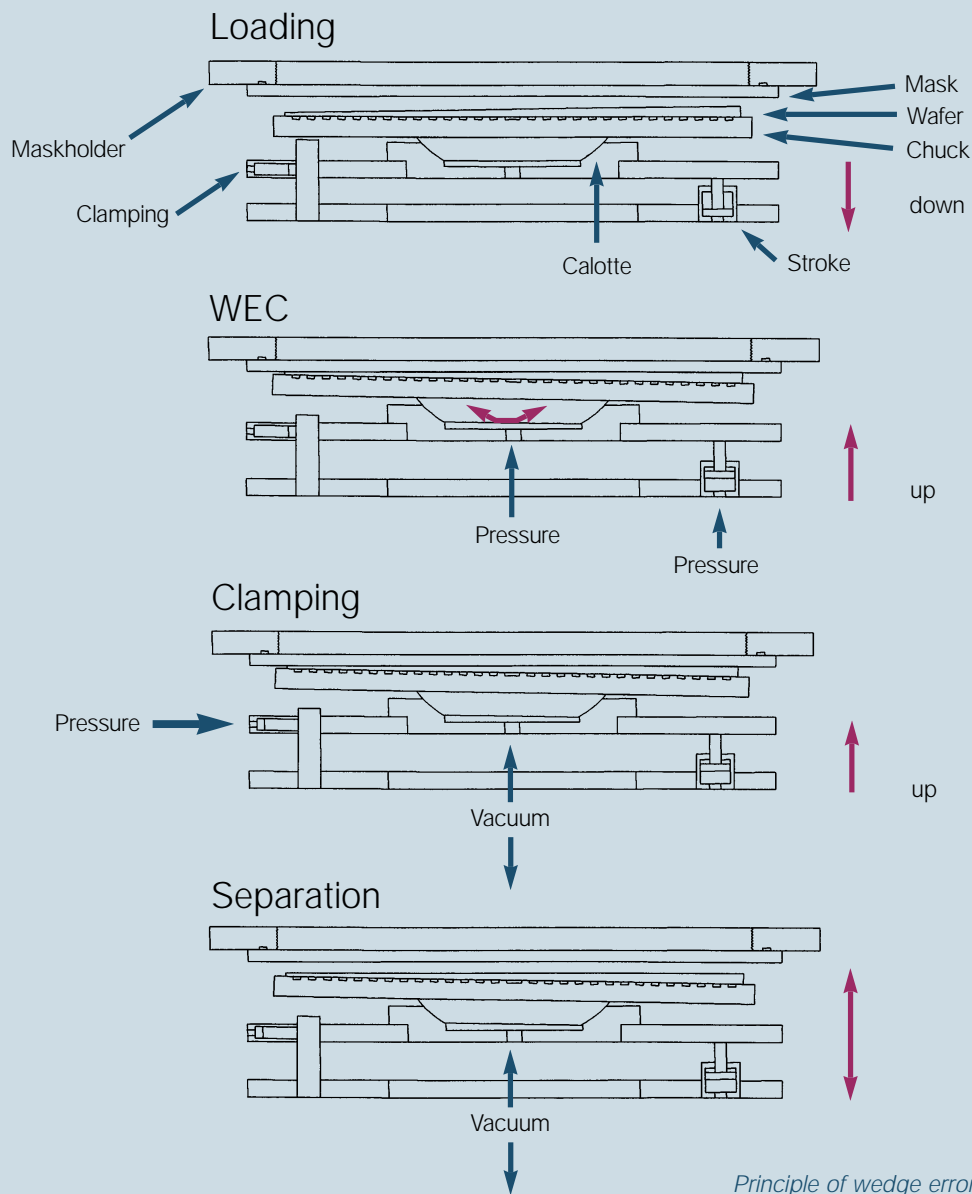
MA 1006 TSA/BSA MA 1008 TSA/BSA

The SUSS MicroTec MA 1006 is a manual mask aligner for top and bottom side alignment with exposure programmes for proximity, soft, hard and vacuum contact suitable for wafers up to 150mm diameter and substrates up to 150mm x 150mm.

The SUSS MicroTec MA 1008 is a manual mask aligner for top and bottom side alignment with exposure programmes for proximity, soft, hard and vacuum contact suitable for wafers up to 200mm diameter and substrates up to 200mm x 200mm.

MA 1006/8 is equipped with a programmable control unit. Alignment is carried out by means of micrometer screws, the Z-axis is motorized. The machine is fitted with a calotte chuck wedge error compensation system. As an alternative to the standard 350W lamp, the equipment may be fitted with a 500W or 1000W exposure lamp. For top side alignment the aligner is equipped with a splitfield microscope. An upgrade with a CCD camera and monitor is possible. For backside alignment the MA 1006/8 could be equipped with BSA microscopes using a

special image storage system. The spectral range is UV 400 and UV 300. The exposure illumination uniformity over a 6" wafer is $\pm 5\%$. Both the alignment and exposure distances are adjustable in $1\mu\text{m}$ steps. The mask aligner is based on a modular antivibration table. In addition to its conventional use in laboratory and development, the SUSS MicroTec MA 1006/1008 is also suitable for micro optics - micro mechanical devices and both thick and thin film requirements.



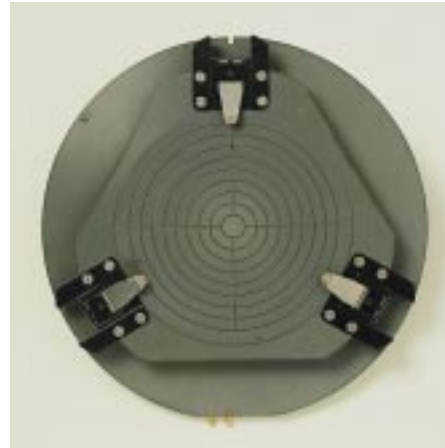
WEDGE ERROR COMPENSATION

The SUSS MicroTec MA 1006 / MA 1008 is equipped with a calotte chuck system for wedge error compensation. This system allows a shift free operation and a very low force is adjustable between mask and substrate during wedge error compensation. This contact force is adjustable

between 2 and 8 N. Nevertheless optimum results of the wedge error compensation are reached. The high precision wedge error compensation system is based on an air bearing system. During the wedge error compensation with adjustable wedge error pressure an automatic thickness compensation is given.



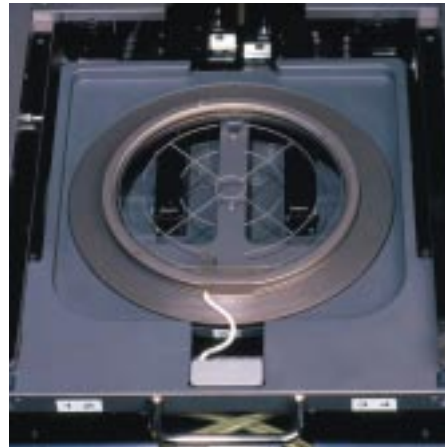
Chuck for Soft-, Hard- and Vacuum Contact Exposures



Chuck for Proximity, Soft- and Hard Contact Exposures



Chuck for Soft Contact Exposures and Back Side Alignment



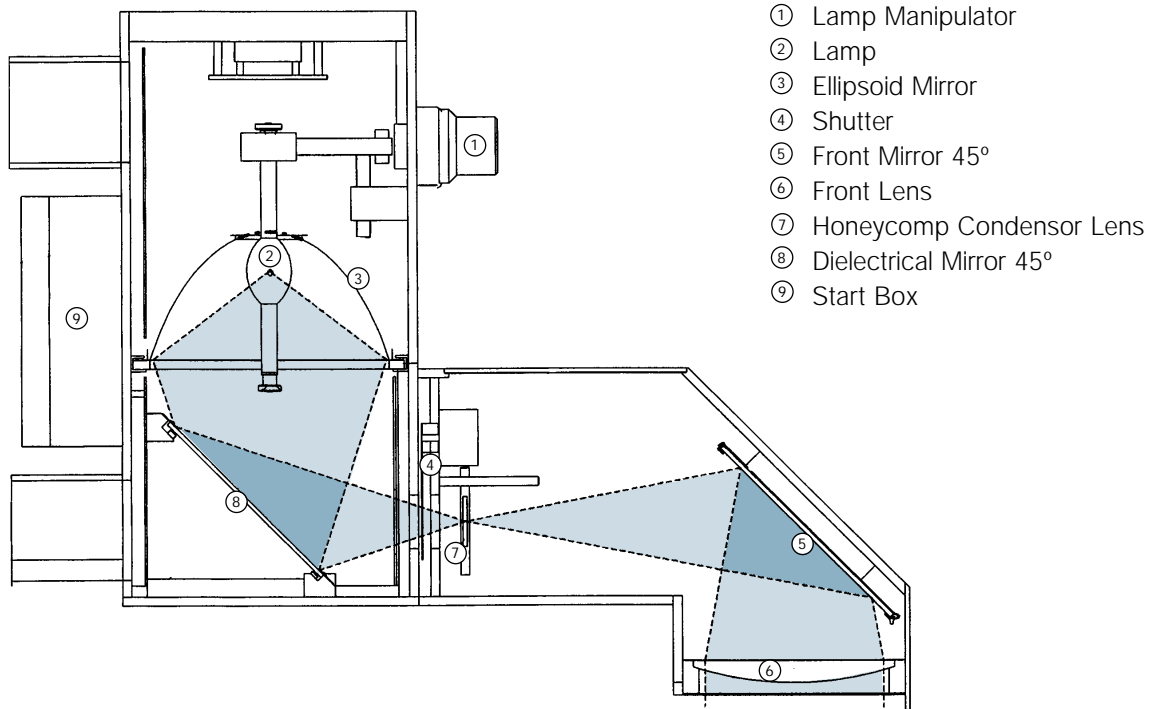
Chuck Loading Plate, Glass Chuck and BSA Microscopes

CHUCKS AND MASK HOLDERS

The SUSS MicroTec Mask Aligners offer a wide range of chucks and mask holders from 1" diameter wafers up to 200 x 200mm substrates. The thickness of a wafer or substrate can reach up to 5mm. For non Semi Standard material chucks

and mask holders can be customized. Chucks are available for all exposure programmes including proximity, soft, hard and vacuum contact. For bottom side alignment there are transparent glass chucks available to view the substrates from the back side.

EXPOSURE PROGRAMMES



- ① Lamp Manipulator
- ② Lamp
- ③ Ellipsoid Mirror
- ④ Shutter
- ⑤ Front Mirror 45°
- ⑥ Front Lens
- ⑦ Honeycomp Condensor Lens
- ⑧ Dielectrical Mirror 45°
- ⑨ Start Box

Proximity:	
Alignment and Exposure Gap adjustable in 1µm steps:	0 - 999µm
Soft Contact:	
Adjustable Contact Pressure:	2 - 8 N
Hard Contact:	
Nitrogen Pressure underneath the wafer:	0 - 2 bar
Vacuum Contact:	
Vacuum:	<-0,8bar (200mbar)



SUSS MicroTec MSP 150/200 with binocular photo head

Objectives	Field of view	Working distance	Eyepieces	Depth of focus	Resolution
2.5x	4,0 mm	11,3 mm	10x	80μm	3.5μm
5.0x	2,0 mm	12,0 mm	10x	60μm	2.5μm
10x	1,0 mm	10,1 mm	10x	20μm	1.25μm
20x	0,5 mm	12,0 mm	10x	3μm	0.8μm

MICROSCOPES

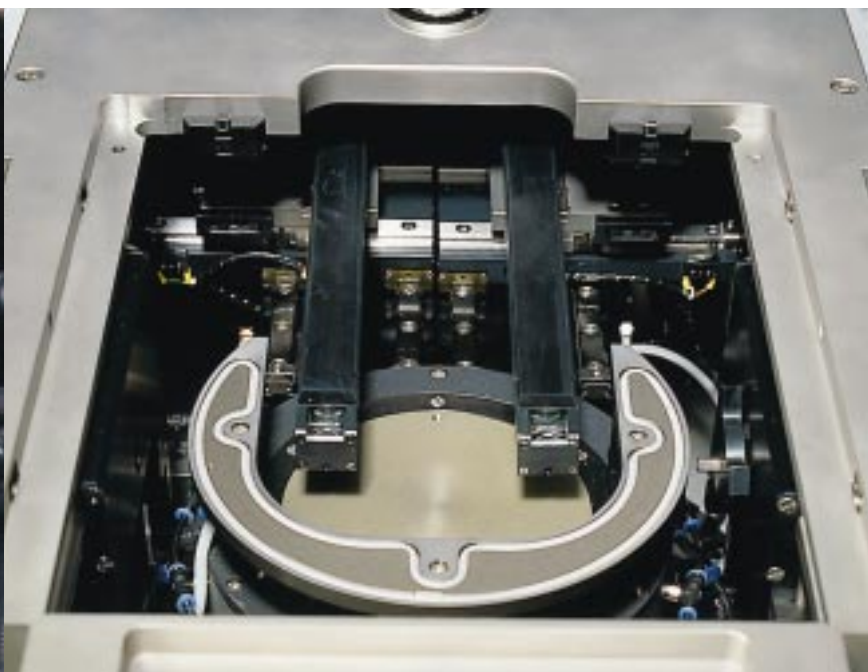
The SUSS MicroTec MSP 150 / 200 has a very large range of objective distance adjustable from 31mm up to 241mm without a change in focus. It may be equipped with a binocular head or binocular photo head. Its large working distance and depth of focus in addition to a very good image resolution is another advantage of the SUSS MicroTec MSP 150 / 200. The SUSS MicroTec MSP 150 / 200 may also be equipped with two objective revolvers for three different objectives.

Top Side Splitfiled Microscope MSP 150 / 200:

- Adjustment range in X : 10mm left /right
- Adjustment range in Y : 10mm left /right
- Adjustment range in Θ : $\pm 5^\circ$
- Objective distance adjustable: 31mm - 150/241mm
- One objective moveable to pass center position

Additional Objectives for MSP 150 / 200:

- Objective: 2.5 x
- Objective: 5.0 x
- Objective: 10 x
- Objective: 20 x



BSA Video Camera System - Photo Tubes.

VIDEO CAMERA SYSTEM

For the back side alignment (BSA) of a wafer to a mask the MA 1006/8 can be equipped with the Digital Storage System DSS 02. This video equipment contains of two black and white CCD cameras, a b/w monitor and the video processing unit.

For the alignment the mask image is stored onto the monitor. The superimposed real wafer image is then adjusted to the stored mask image.

The DSS 02 can also be used in the same way for top side alignment (TSA) only. In this case the Splitfield Microscope MSP 150/200 is equipped with one b/w CCD camera and a b/w monitor and the video processing unit.

For Mask Aligners with both TSA and BSA equipment the DSS 02 is shared between either one. It will be activated by hitting the appropriate button on the Aligner key board.

Splitfield Video Camera System:

- | | |
|-------------------------|----------------------|
| - Image Storage System: | SUSS MicroTec DSS 02 |
| - Camera: | CCD 2/3" Chip |
| - Monitor: | Screen 10" - 15" |

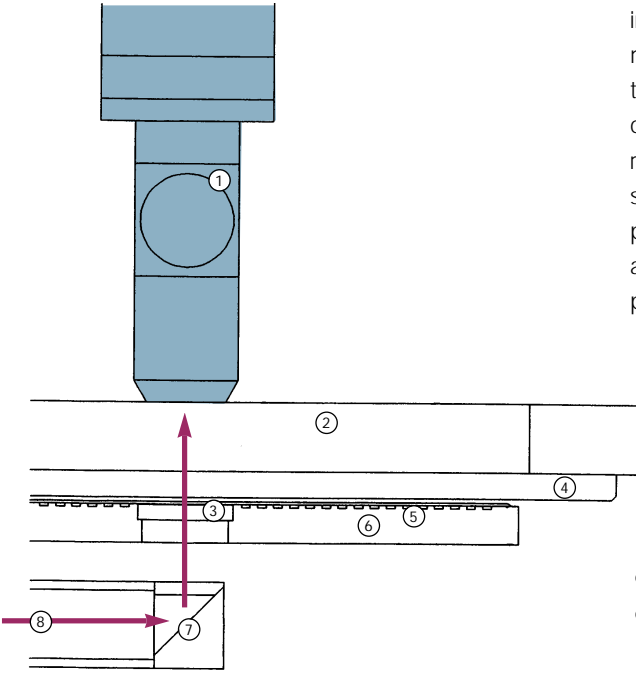
- Optics:

- | | |
|--|--------------|
| - Zoom factor nom.: | 5x 35x |
| - Zoom factor visual
(14" Monitor): | 150x - 1000x |



INFRARED ALIGNMENT SYSTEM

The SUSS MicroTec MA 1006 / MA 1008 can be equipped with a bottom side infrared alignment system. This alignment system includes a video infrared camera, a 14" black and white video monitor, a control unit for the illumination, a bottom side infrared illumination, a special glass IR-chuck and a modified alignment stage. The camera is equipped with a 2/3" (or similar) highly sensitive IR vidicon imaging tube with a spectral response from 400nm up to 1.600nm. Also available are lead sulfide imaging tubes with a spectral response from 400nm up to 2.000nm.



- ① Infrared Video System
- ② Mask Holder
Top/Bottom Side
- ③ Window
- ④ Mask
- ⑤ Wafer
- ⑥ Chuck
- ⑦ Prisma
- ⑧ Infrared Illumination

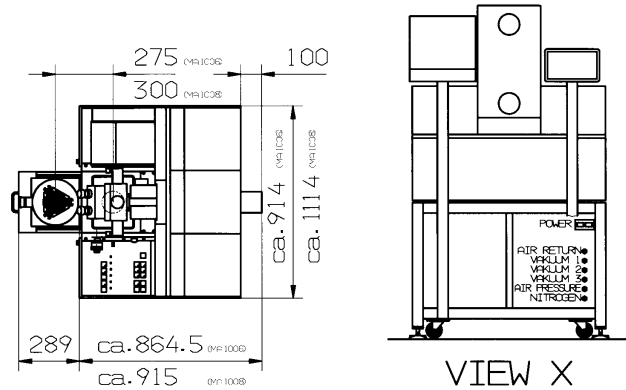
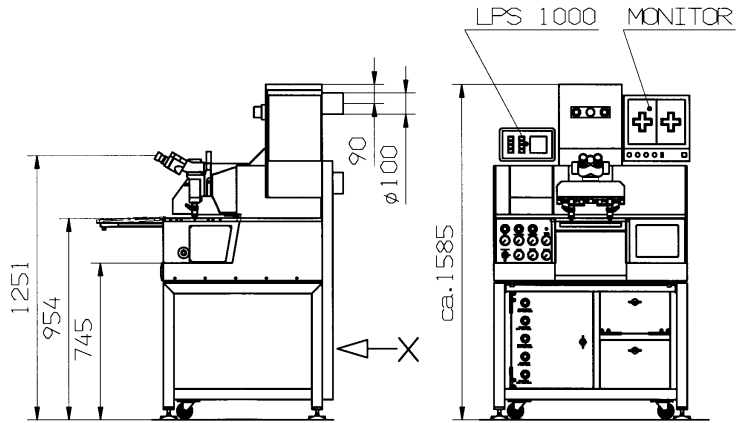
TECHNICAL DATA

Dimensions MA 1006:

- Width: ca. 920 mm
- Height: ca. 1600 mm
- Depth: ca. 870 mm
- Weight: ca. 450 kg

Dimensions MA 1008:

- Width: ca. 1150 mm
- Height: ca. 1600 mm
- Depth: ca. 920 mm
- Weight: ca. 500 kg



Dimensions MA 1006

Utilities:

- Vacuum: < - 0,8 bar (200 mbar)
- Compressed air: 4 bar - 6 bar, 1m³/h
- Nitrogen: 2 bar - 3 bar, 0,5 m³/h
- Voltage: 230 V ± 10%, 50/60 Hz

Power Requirement:

- 350W lamp: 1.200 VA
- 1.000W lamp: 2.000 VA

Wafer / Substrate Size:

- Wafer size: (MA 1006) max. 150mm ø
- Substrate size: (MA 1006) max. 150 x 150mm
- Wafer size: (MA 1008) max. 200mm ø
- Substrate size: (MA 1008) max. 200 x 200mm
- Thickness: 0 - 5mm

Mask Size:

- Mask size: (MA 1006) max. 7" x 7"
- Mask size: (MA 1008) max. 9" x 9"

Exposure Optics:

- UV400: 350nm - 450nm: Hg-lamp: 350W / 1000W
- UV300: 280nm - 350nm: Hg-lamp: 350W / 1000W
- Uniformity
 - (wafer ø 150mm): (MA 1006) ± 5% typical
 - (wafer ø 150mm): (MA 1008) ± 7% typical

Data depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously. Illustrations in this brochure are not legally binding. Design and specification of custom built machines depend on individual conditions and can vary according to equipment configurations.

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