

Technical Data Sheet

Sigma W12 Wafer Bondtester

The Sigma W12 wafer bond tester is a highly flexible machine that is suitable for a wide range of test requirements, from the laboratory to series production. This model is primarily designed and conceived for the bond testing of 12" wafers.

The unique design, which is characterized by its space-optimized dimensions and modular structure, offers the best user-friendliness combined with high flexibility. The rotating measurement unit (RMU) offers space for six sensors with different force ranges.

Using wafer chucks specially developed for the Sigma W12, the wafer to be tested can be fixed absolutely planar by means of vacuum and, if necessary, wafer pushers. This reduces warpage and any induced residual stresses to a minimum. These wafer workholders are available in different sizes depending on the size of the wafer. The Sigma W12 bond tester is specially designed for carrying out tensile and shear tests on solder balls and shearing off dies.

The modular design of the machine makes it possible to make changes, extensions and customer adaptations of any kind without having to change the essential design and thus the recognition value of the machine.

The graphical user interface (GUI) of the Sigma W12 is clearly divided into various control panels, which are used for intuitive processing and can be accessed via a fixed menu bar that is visible at all times. The logically structured software interface supports the user in creating their own test methods and fracture codes for subsequent grading.

The Sigma W12 can be operated in manual, semi-automated and fully automated mode. Many different modules are available to the operator for setting up customized automation, which can be easily linked together. No knowledge of programming languages is required.

Integrated image and video capture

The standard configuration includes a vertically looking camera permanently installed on the frame of the machine at a short distance from the test point. This can be used for taking images before and/or after the bond tests, but also for programming automation. Three magnifications are available to the user with an optical resolution of 1.5 μm . The xyztec software supports up to three live camera views simultaneously.

Soft landing and high accuracy

The Sigma W12 can perform a wide range of tests at forces from < 0.1 gf to 10 kgf. The digital temperature correction and the 24 bit AD converter ensure an accuracy and repeatability of $\pm 0.075\%$. The axes (x, y, and z) can be moved from 1 mm/s to 50 mm/s depending on the requirements and corresponding settings in the software. The joystick sensitivity integrated in the intelligent software enables fast movements and automatic deceleration when approaching the test area.

Enhancement options:

- Handling and transfer systems
- Customized automation with system expansion for handling and transfer systems
- Aligner systems for correct alignment of the wafer
- Wafer cleaning unit
- Wafer loader for automatic loading and unloading
- Integrated MES interface: SECS/GEM, GEM300
- Compressed air resp. Vacuum cleaning device (e.g. for solder ball shear tests)
- Image and pattern recognition software package
- Ergonomic SEMI S2 housing
- Camera solutions of various magnifications
- Grey value correlation analyses for assessment of creep behavior

Characteristics and technical specifications

Force sensors	
Ranges	100 gf, 1 kgf, 10 kgf
Max. shear force	10 kgf
Max. pull force	10 kgf
Accuracy	$\pm 0,075\%$
ADC resolution	24 bit
Min. landing force	2,5 gf

Axes	
Resolution of optical encoders	$\pm 30\text{ nm}$
x-axis	500 mm
y-axis	370 mm
z-axis	90 mm
Axis speed	50 mm/s
Hook concentricity	$\pm 10\ \mu\text{m}$
Rotational accuracy	$\pm 1^\circ$

Dimensions	
x footprint	1300 mm
y footprint	935 mm
Height	608 mm
Weight	100 kg

Software	
Supports from Microsoft Windows 7, 32 and 64 bit systems	
Intuitive, no special knowledge required	
Customization of the user interface according to customer requirements	
Integrated Report editor and data export	
Integrated SPC and GR&R analyses	
Different languages and user hierarchies	
Export to xls, docx, pptx, pdf, xps, csv, xml, etc.	
Easy data sorting, grouping and filtering	
Customizable screens, optimized for wide and touch screens	

Handling and control	
Ergonomic layout according to SEMI S8	
Microscope adjustable in height, depth and angle	
Swivel microscope holder	
Ergonomic joysticks with each 6 buttons for fast control	
LED illumination	

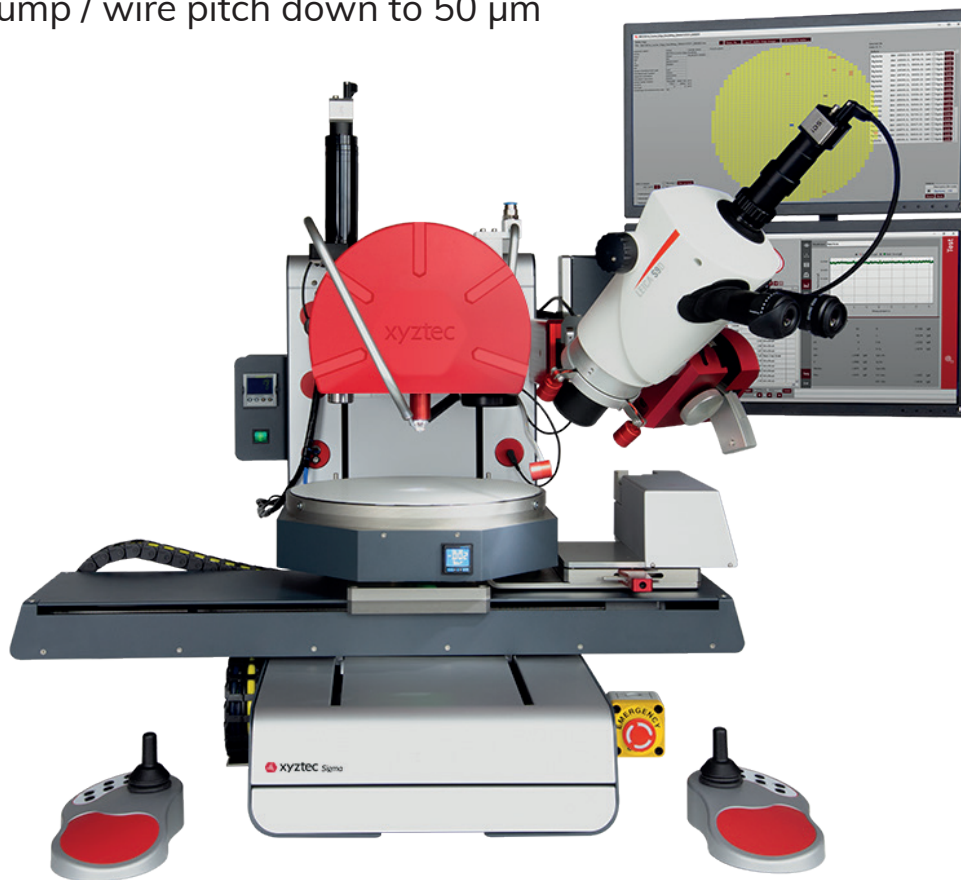


Wafer bond tester Sigma W12



Bond tester for 12" wafers

- Bond tester for wafer sizes from 4 - 8"
- Wafer bond tester for manual, semi-automatic and fully automatic testing
- x stage: 370 mm, y stage: 370 mm
- Force range from 0.075 gf - 10 kgf
- Bump / wire pitch down to 50 μm



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