

Sigma HF

High Force Bond Tester



setting
new
standards



Technology leader in bond testing worldwide

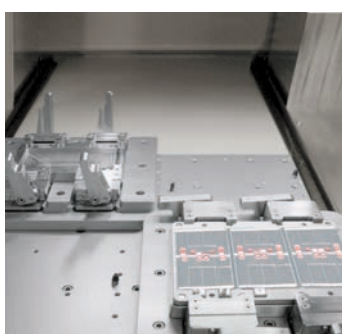
Sigma HF

**5 times
higher
force**

Sigma High Force Bond Tester

The *Sigma HF* sets a new industrial standard by combining many new advances and features with the unique and proven strengths of our existing *Sigma* series.

Whether you need a dedicated or multipurpose bond tester, the *Sigma HF* is the best choice. The *Sigma HF* features unparalleled accuracy, the best ergonomics, highest throughput, full automation capability, maximum flexibility, life time support and the lowest cost of ownership.



Larger working area of 500x500x200mm for flexible positioning and multiple (customized) workholders

For forces up to 1000 kgf

XYZTEC has developed a new test system capable of applying accurate shear, pull and push forces up to 1000 kgf. The new *Sigma HF* includes full 360° shear tool rotation with vectored shear direction. This makes the new *Sigma HF* the ideal test tool for IGBT power modules and other high force applications.

A range of tooling ensures precise load application to the test point. Quick release sample clamping options ensure accurate testing together with rapid load and unloading.

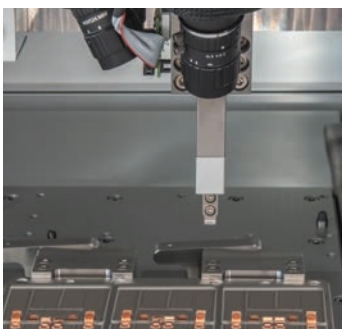
Larger working area

The *Sigma HF*'s test volume of 500 mm in X and Y combined with 200 mm in Z provides the flexibility to test multiple samples. Larger travel ranges for applications including battery modules and large Panel Level Packaging (PLP) are possible on special request.

**4 times
larger
working area**

Positional accuracy

The *Sigma HF*'s system stiffness of 0.1 mm / 1000 kgf tool to work holder sets a new standard in tester rigidity. High tool to sample positional accuracy enables automation of the most complex circuit architecture. Bond strength is measured with an accuracy of $\pm 1\%$.



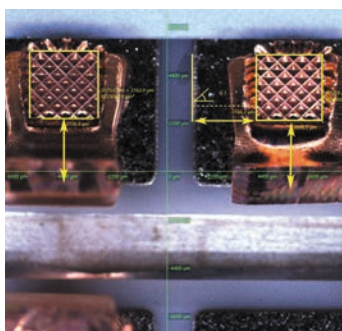
Exceptional system stiffness of 0.1 mm per 1000 kgf

**10 times
higher
axis speed**



Most rigid test head in the industry for forces up to 1000 kgf.

**up time
(OEE)
above 90%**



Advanced image measurement by drawing a line or a shape to measure the length, width, height and area

High resolution and soft landing

The *Sigma* family offers digital temperature correction and 24 bit resolution to ensure the accuracy and repeatability of measurement results. The X, Y- and Z stage speeds can be set between 0 mm/s to 500 mm/s while still producing its 1000 kg force with micron precision. Intelligent software enables extremely rapid “fly” movements and automatic deceleration as the test area is approached. The large stage travel distances and rapid power up are also standard features of the *Sigma HF*. Industry leading shear sensors have programmable landing forces and shear height accuracy confirmed with laser measurement.

Application flexibility

Force

The *Sigma HF* system offers superior flexibility with sensors for shear, push and pull forces from several grams up to 1000 kgf. A wide variety of tests is possible with a wide range of tooling selections.

Single Measurement Unit (SMU)

The open *Sigma* head interface is suitable for either a high force single head measurement unit for forces up to 500 kgf or a single head measurement unit forces up to 1000 kgf.

AOI measuring toolkit

The measurement tool kit offers a variety of options for fully examining samples. The toolkit makes use of advanced image processing software and our advanced high-resolution cameras. A few of the features that can be measured automatically include; largest distance, smallest distance, object area, distance between objects, angle between objects and wire thickness.

Other innovative solutions

- Self-aligning shear tool (patented)
- Deep access tool to enable complex sample architecture
- Inline option for automatic loading

**stop guessing
start
measuring**



Unique 360° head design with up to five mounted cameras

**maximize
your tests per
hour (UPH)**



Full safety guarding for more extensive safety precautions

Automation

Complex samples can be tested fully automatically. Production tolerances in bond and wire positions being automatically corrected with multiple nested fiducial and individual wire detect capability. Automation programming is structured for easy generation and maintenance.

Auto grading

XYZTEC's advanced image processing software provides the option to automatically grade sheared samples. Using optical inspection, the area of bulk material remaining is calculated as a percentage of the whole. This result and a picture with graphical overlay are stored on the system. Automatic grading removes operator influences improving accuracy and reduces distribution.

Built-in image capture and automation camera

Unique to the Sigma HF are its up to five high speed 6 megapixel cameras for easy positioning and programming.

Perfect tool alignment is possible with up to 3 side-view or front-view tool cameras on a 360° rotational head. Up to 2 perpendicular fiducial cameras can be equipped for sample clamping detection using fiducial mark recognition.

Multiple cameras are particularly useful when you need a large field of view for automation as well as a high magnification for image capture.

Safeguarding

Higher forces and speeds require more extensive safety precautions. The *Sigma HF* system is fitted with full safety guarding that allows for both production line flexibility and ease of use. Access points are designed to protect the operator and provide ergonomic access for easy sample loading.

Specifications

Force sensors	Single measurement unit (1 sensor)	500	kgf
	Single measurement unit (1 sensor)	1000	kgf
	Shear sensor deep access	80	mm
	Resolution	24	bit
	Accuracy	±1	%
	Minimum landing force	2.5	gf
	Correlation with other testing systems		
	Digital correction of temperature and creep		
	Calibration weights OIML class M1 or NIST class 1		
Stages	Resolution of built in optical linear encoders	10	nm
	X travel, Y travel	500	mm*
	Z Travel	200	mm
	Axis (X,Y & Z) speed	500	mm/s
	Hook concentricity	±10	µm
	Software hook concentricity	±5	µm
	Tool rotation accuracy	±1	°
Mechanical	Footprint X & Y	1200	mm
	Height	2000	mm
	Weight	1300	kg
Controls	Ergonomic layout to SEMI S8		
	Two ergonomic joysticks with 6 quick access buttons each		
	LED illumination		
Software	Fully compatible with <i>Sigma</i> software		
	Supports Microsoft Windows 7/8/10™, 32 and 64 bit systems		
	Easy to learn intuitive graphical user interface		
	Minimum number of mouse clicks		
	Customizable screens, optimized for wide and touch screens		
	Integrated report editor and data export		
	Easy data sorting, grouping and filtering		
	Integrated SPC and system GR&R analysis		
Services	Multiple languages, multiple user network environment		
	Export to XLS, DOC, PPT, PDF, XPS, CSV, XML, DBF, etc.		
	SECS/GEM**		
	Compressed air >600 kPa required		
	1 Phase 100-240VAC 1+N+PE 45-64 Hz 5A		
	3 Phase 207-528VAC 3+N+PE 50-60 Hz 8A		
	MAX OCP device 3x16A		
	SCCR 10 kA		
Cameras	300mA earth leakage protection		
	Vibration class VC-C (SPIE99)		
	Front tool camera	6 MP	High speed
	Side tool camera	6 MP	High speed
	Fiducial camera	6 MP	High speed

Specifications are subject to change without prior notice.

* XYZTEC also offers *Sigma* platforms with larger axis strokes for 12 inch (300mm) wafer testing and other applications.

** Contact XYZTEC for more information and options for your factory.

stay
up-to-date
free software
updates



XYZTEC's international team for sales and service and our international offices

global
presence
local
support



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