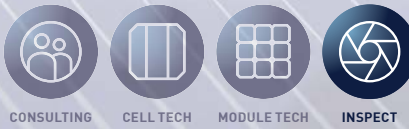


GP STAB-TEST PRO

OFFLINE MECHANICAL STABILITY TESTER



SITUATION

High throughput and uptimes combined with low breakage rates are some of the main tasks of modern solar cell production lines.

Latest development is decrease of wafer thickness in the range of 200 μm and below. Processing these wafers needs a high knowledge of maximum stability and mechanical strength. During processing, the mechanical stability of a wafer can be strongly influenced.

Especially if high breakage is detected in the line, testing of the mechanical stability helps to identify the cause. The GP STAB-TEST is a tool specially designed for this application. With additional test stages, the GP STAB-TEST can also be used for busbar adhesion force measurement after tabbing, and cell bow measurements after firing.

DESCRIPTION

The GP STAB-TEST is a tool for measuring the stability of a wafer or a cell by mechanical bending.

The GP STAB-TEST consists of a force sensor mounted on a linear axis. Different adapters to the force sensor and different base plates allow for a wide range of measurements of force versus displacement. For standard stability testing, the sample is placed on two tips in one diagonal of the wafer, whereas two

other tips in the other diagonal press from top. This so-called "twist test" is suited for simulating the stress on a wafer during screen-printing process. Measurement of the force and displacement during bending give worthy information on the stability. Different test routines, either limited by maximum force, maximum displacement or both as well as measurement of the breakage displacement/force can be carried out. Setups for different force/displacement test like ball/ring test and slab bending are also available.

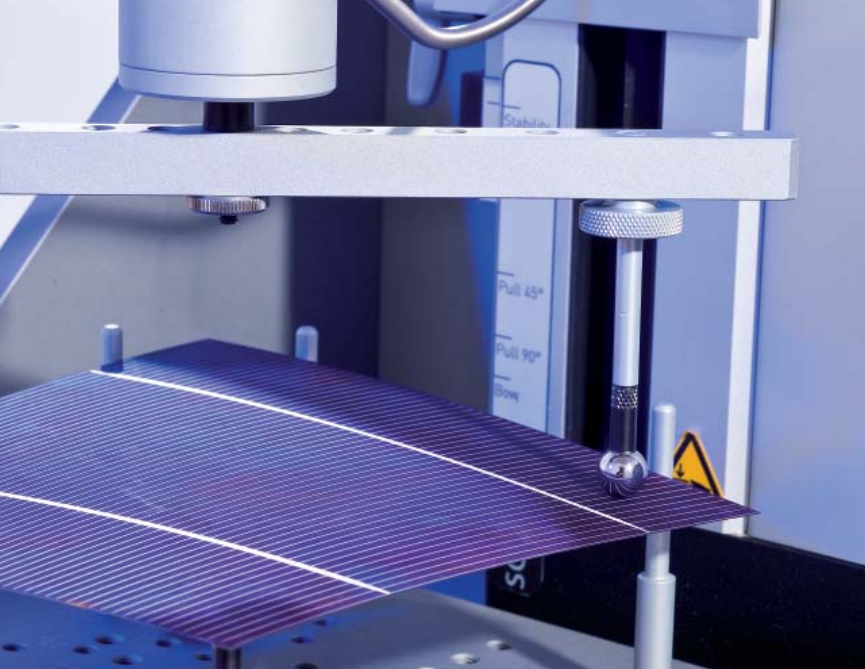
Bow measurements can be carried out by measuring the displacement between touching the surface of a sample when it is relaxed (with bow) and when it is pressed flat on a plate. For adhesion measurements, the cell is fixed to the base plate, and the tabbing mounted to the force sensor. Up-movement of the force sensor pulls the tabbing from the cell. Two simple stages for 45° and 90° pulling are available as well as an advanced pull plate where the cell is actively moved to guarantee a 90° pull angle.

The GP STAB-TEST system consists of a calibrated force sensor/amplifier combination and a high class Keithley multimeter for accurate measurement result. A operator-friendly software serves for controlling the measurement setup, data evaluation, data logging, and recipe management. The GP STAB-TEST helps identifying causes for increased breakage in a production line and therefore helps to reduce breakage rate.

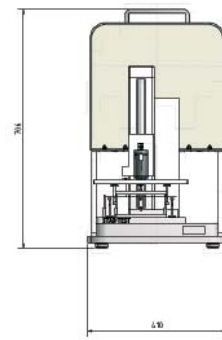


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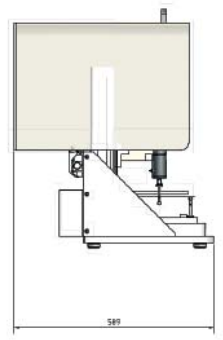
INSPECT



Testing the mechanical stability with GP STAB-TEST Pro



front view



side view

GP STAB-TEST Pro

TOPIC	DESCRIPTION
Samples to be measured	<ul style="list-style-type: none"> > Mono- and multi-crystalline wafers/cells > Square or pseudo square
Wafer size	100 ... 210 mm
Measurements	<ul style="list-style-type: none"> > Stability measurement with force limit, stability limit, force/stability limit, or breakage force/displacement > Adhesion testing > Bow testing
Force accuracy	+/- 10 mN
Displacement Resolution	+/- 5 µm
Power supply	230 V 50-60 Hz
System dimensions (W x H x D)	420mm x 570mm x 480mm (GP STAB-TEST unit) 480mm x 440mm x 550mm (PC + Measurem. equip.)
Order Information/Article Number	04.01.0004

Note: some of the mentioned features are optional. Technical details subject to change without prior notice.
Only technical specifications in quotations and duty books are binding.

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