KLA-Tencor

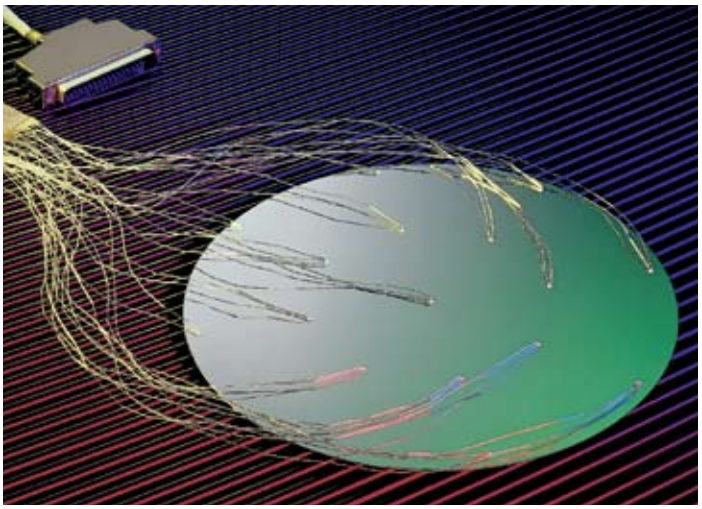
Accelerating Yield

Process Probe™ 1530

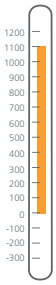
Instrumented Wafers

RTP, PVD, CVD and EPI

Process Probe™ 1530



0°C to 1100°C WIDE RANGE TC WAFER



- Excellent TC-to-TC matching of <0.1°C
- Highly accurate real time measurement
- High accuracy and repeatability in hot wall and cold wall chambers
- High tolerance to thermal shock

THE LARGEST RANGE OF TEMPERATURES FOR *IN SITU* MEASUREMENT OF REAL TIME WAFER TEMPERATURES

The Process Probe™ 1530 instrumented wafer enables precise *in situ* characterization of wafer temperature profiles for a wide range of semiconductor processes. Optimized for use in hot wall and cold wall systems, it provides highly accurate temperature measurements for:

- Optimizing temperature controller parameters
- Reducing equipment qualification time
- Improving uniformity in multi-zone heaters
- Determining wafer stabilization times

The Process Probe 1530 measures a wide temperature range from 0 to 1,100 °C, with thermocouple-to-thermocouple precision of <0.1°C in a hot wall chamber. The instrumented wafer is available in standard sizes from 50 mm (2") to 300mm (12"), with up to 34 thermocouples. The thermocouples can be placed in bare, coated, or patterned substrates to match the thermal properties of test or product wafers.

A flat cable feedthrough allows use of the 1530 in most atmoshpheric and low pressure systems without modification.

AT A GLANCE

Accuracy	±1.1°C or ±0.4 %
Sensor-to-Sensor	<0.1°C
Sensor Type	TC - Type K
Wiring Specifics	Qtz Microtubing, Braided Silica Polyimide Coated Insulation
Sensor Quantity	1-34

SPECIFICATIONS

Substrates	Silicon, GaAs, glass and ceramic, or customer supplied bare, coated or patterned 2-12" wafers
Thermocouple	Type K (special limits)
Sensor Leads	0.003" diameter
Lead Length	Up to 60" (1.5 m)
Lead Insulation	
0-1100 °C	Quartz microtubing segments or braided silica sleeving
0-250 °C	Polyimide Coated Insulation
Feedthrough	Polyimide flat cable with seal under chamber 0-ring, 10^{-3} to 10^{-9} Torr capable
Connector	80 pin Hirose HDS, D-type sub-miniature (≤37 pins) or 2-pin subminiature plugs

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Temperature

BENEFITS OF USING THE PROCESS PROBE 1530

- Perform preventative monitoring
- Determine center-to-edge temperature variation for adjusting heater zone set points
- Diagnose thermal problems quickly with less downtime
- Utilize the highest accuracy metrology to tune the critical plate temperatures
- Evaluate run-to-run, month-to-month chamber repeatability

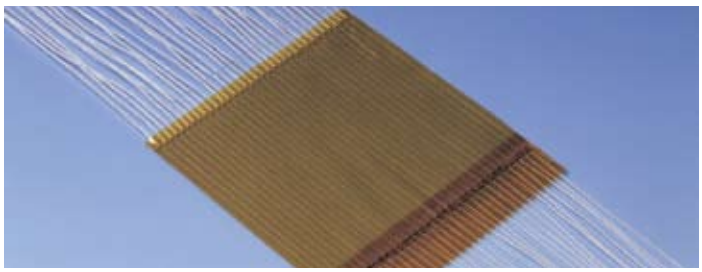
COMMON USES

- **Process visualization**
- **Tool installation and start up**
- **Engineering analysis**
- **Troubleshooting assistance**
- **Chamber matching**
- **PM qualification**
- **Process optimization**

APPLICATION FLEXIBILITY

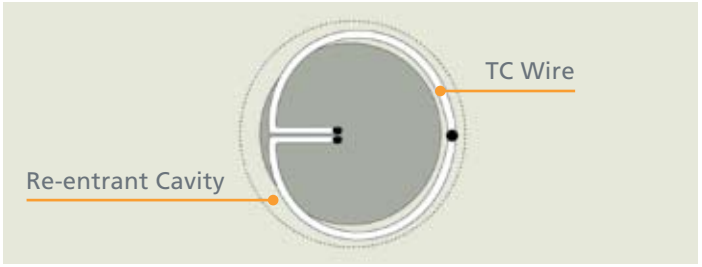
The Process Probe 1530 is designed for use in a variety of equipment configurations, spanning a wide range of temperatures (0 °C to 1,100 °C). All thermocouple leads are safely insulated for a specific temperature range, using either low-particulate quartz microtubing or highly flexible braided silica sleeving for high temperatures, or polyimide coated insulation for lower temperatures.

SIMPLE TO INSTALL AND USE

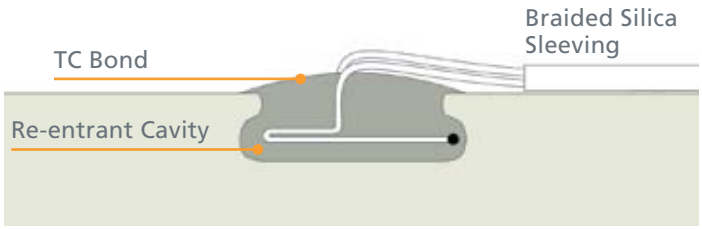


With a flat cable feed through, the 1530 is ready to go in minutes. Just position the wafer with leads in the boat or chamber. Then, place the flat cable under the end cap, O-ring, or flange seal and close the chamber. This maintains the integrity of the chamber vacuum or atmosphere without requiring a vacuum feed through or equipment modification in most cases.

ADVANCED THERMABOND™ TECHNIQUE



The ThermaBond™ technique securely embeds the thermocouple sensors into the silicon, delivering unprecedented measurement accuracy and optimum reliability. The thermocouples are deeply immersed into a reentrant cavity in the wafer and secured with a ceramic bonding material.



This enhanced conduction bond improves heat transfer, maintains its strength, and is extremely tolerant of thermal shock. The ThermaBond structure reduces conduction loss errors 5 to 10 times.

KLA-TENCOR SERVICE and SUPPORT

Customer service is an integral part of KLA-Tencor's portfolio that enables our customers to accelerate yield. Our vast customer service organization collaborates with worldwide customers to achieve the required productivity and performance at the lowest cost.

K-T Services includes comprehensive contracts, time and materials, spares, asset management, customer training, and yield consulting.

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