KLA-Tencor

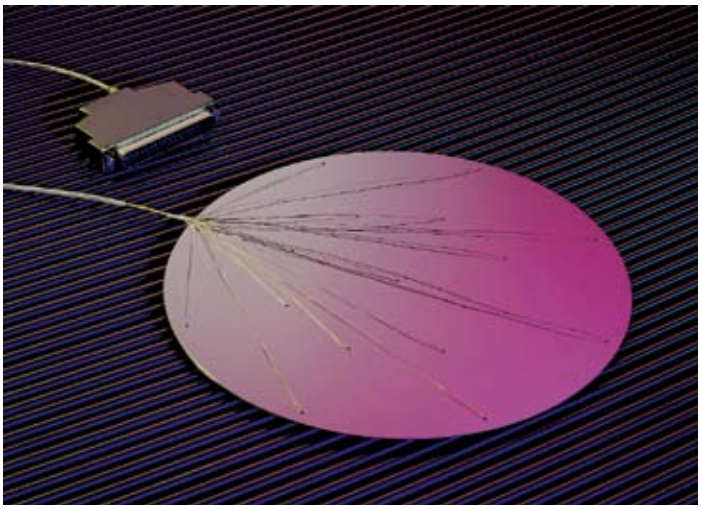
Accelerating Yield

Process Probe™ 1730

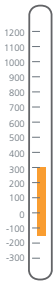
Instrumented Wafers

Probe and Test

Process Probe™ 1730



-150°C to 300°C SUB-ZERO TC WAFER



- Excellent TC-to-TC matching of <0.1°C
- Highly accurate real time measurement
- Below zero temperature capability
- Up to 34 measurements points per wafer

WIDE TEMPERATURE RANGE FOR EXTREME APPLICATIONS, INCLUDING SUB-ZERO REGIMES

The Process Probe™ 1730 instrumented wafer enables precise *in situ* characterization of wafer temperature profiles for probe and test hot and chill plates. The 1730 produces highly accurate temperature measurements and repeatability necessary to characterize a process, calibrate temperature set points, optimize system dynamic response, and establish wafer thermal models for model based control systems.

The Process Probe 1730 measures a wide temperature range from -150 to 300°C, with thermocouple-to-thermocouple precision of <0.1°C. The instrumented wafer is available in standard sizes from 50 mm (2") to 300 mm (12"), with up to 34 Type-K thermocouples. The thermocouples can be placed in bare, coated, or patterned substrates to match the thermal properties of test or product wafers.

With the 1730, wafer thermal response to probe conditions is now available real time during each critical cycle: loading, temperature ramping, steady-state, chilling, and unloading. The response time and stability can be measured as well as how environmental effects contribute to wafer temperature non-uniformity.

Another key benefit to using the 1730 is the ability to reduce set up and recalibration time of the probe and test system. The re-usable 1730 provides immediate response feedback as the plate settings are altered, enabling quick tune times and consistency of values.

AT A GLANCE

Accuracy	±1.1°C or ±0.4 %
Sensor-to-Sensor	<0.1°C
Sensor Type	TC - Type K
Wiring Specifics	Polyimide coating
Sensor Quantity	1-34

SPECIFICATIONS

Substrates	Silicon, GaAs, glass and ceramic, or customer supplied bare, coated or patterned 2-12" wafers
Thermocouple	Type K
Sensor Leads	0.003" diameter
Lead Length	4 feet (1.22 m) standard – other lengths available
Insulation	Polyimide coating
Stress Relief	(Optional) Stainless steel relief clamp near wafer edge when more than one TC
Connector	80 pin Hirose HDS, D-type sub-miniature (≤37 pins) or 2-pin sub-miniature plugs
Feedthrough	Polyimide flat cable with seal under 0-ring, 10^{-6} Torr base pressure compatible with flat cable feedthrough

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Temperature

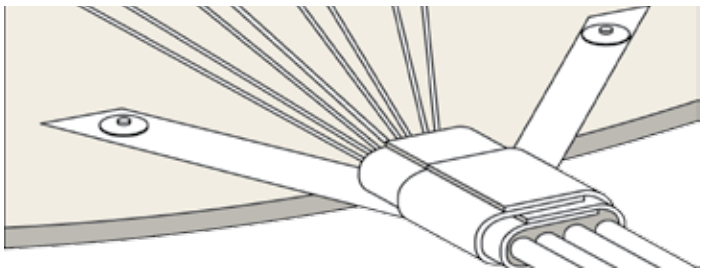
BENEFITS OF USING THE PROCESS PROBE 1730

- Perform preventative monitoring
- Determine center-to-edge temperature variation for adjusting plate 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

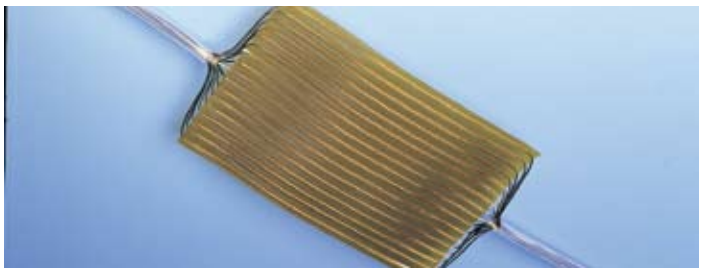
- **Process visualization**
- **Tool installation and start up**
- **Engineering analysis**
- **Troubleshooting assistance**
- **Chamber matching**
- **PM qualification**
- **Process optimization**

APPLICATION FLEXIBILITY



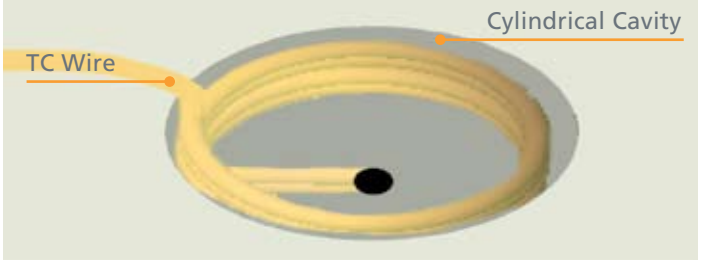
The Process Probe 1730 features a stress relief that is engineered for durability in a wide range of thermal loads. The rugged stress relief clamp assembly facilitates installation and removal of wafers from the plate without damaging the TC-to-wafer bonds. Lead flexibility helps to maintain the correct proximity gap.

SIMPLE TO INSTALL AND USE

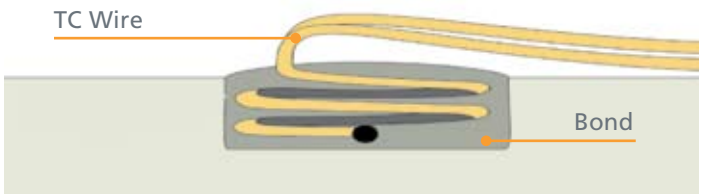


With SensArray's flat cable feedthrough integrated within the TC leads, the 1730 wafers are easily installed in a variety of system designs, without modification to the system. The fine-gauge lead system limits weight imbalance and allows accurate wafer positioning on proximity spacers or pins.

INTEGRATED SENSOR STRUCTURE



Advanced thermocouple bonding technology ensures accurate measurement and high reliability. Highly accurate temperature readings are made by measuring bulk silicon temperature.



The helical thermocouple assembly is bonded into the cylindrical cavity by a high temperature bonding material, providing a long path length of immersion that enhances heat transfer and minimizes sensor temperature errors. Optimum sensitivity and strength are achieved, and leads are electrically isolated.

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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