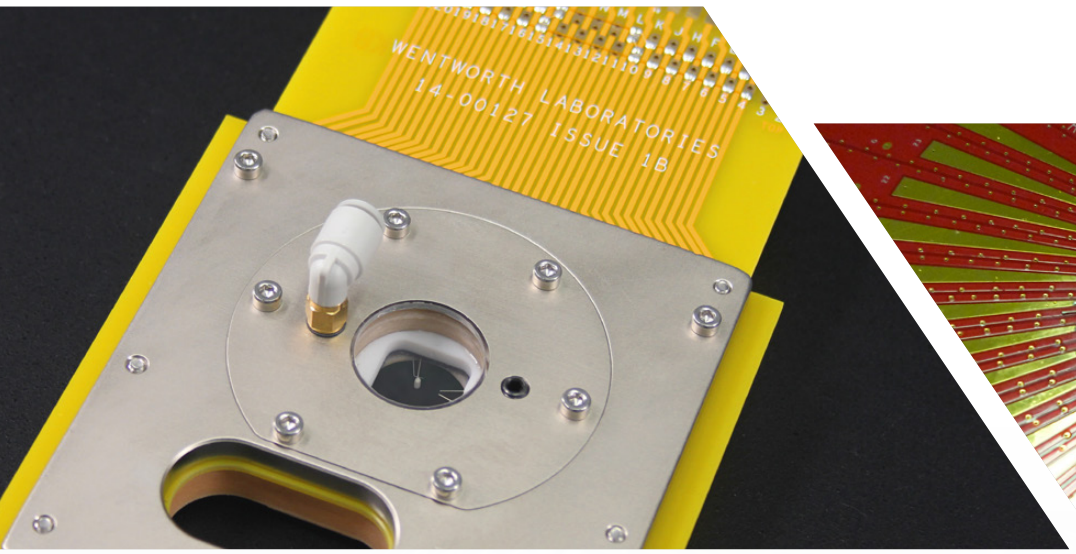
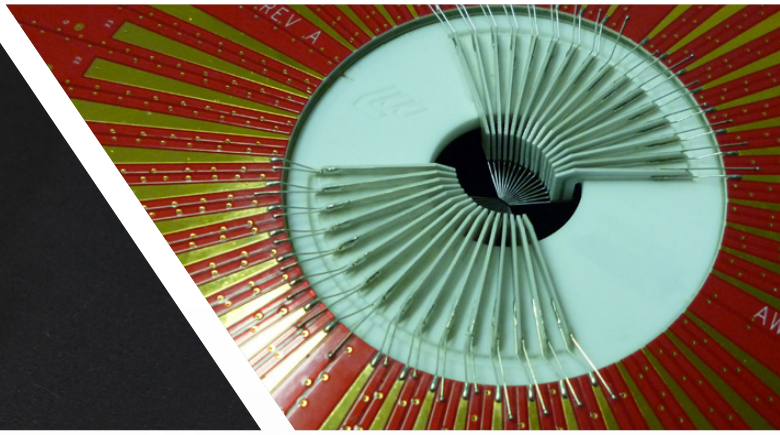
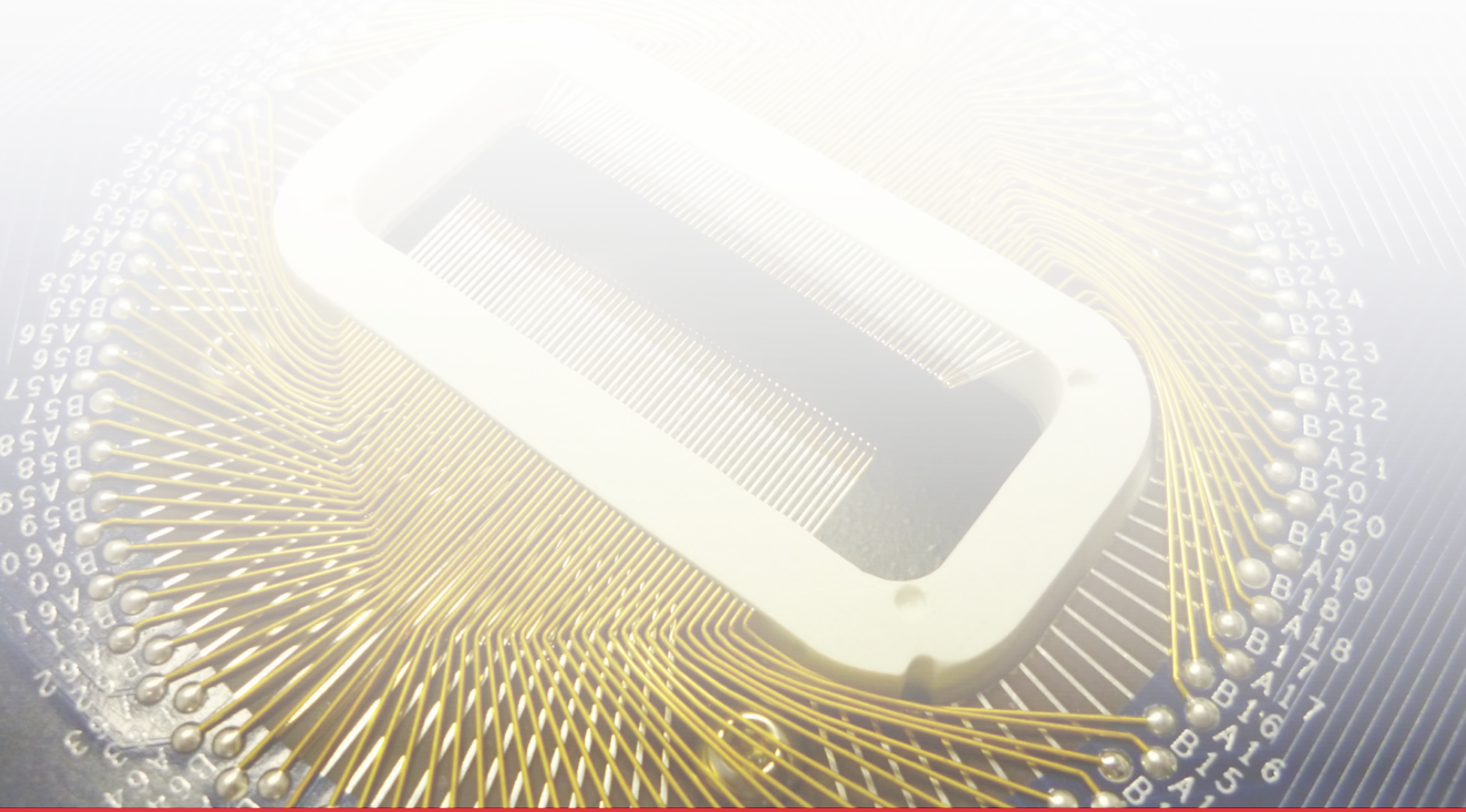
Wentworth Laboratories

PROBER ACCESSORIES:
CANTILEVER PROBE CARDS







EPOXY & BLADE PROBE CARDS

With specialist probe card facilities based in Europe and North America, we build a wide range of standard and custom cantilever probe cards based on epoxy and blade technologies.

Our epoxy probe cards can accommodate high pin counts and benefit from competitive pricing and quick turn-around times. We also have the expertise to build blade probe cards and offer a wide range of parts for their repair. All of our probe cards are supported by a fast maintenance and repair service, and offer a low cost of ownership thanks to:

- Excellent longevity
- Low tip wear
- High precision alignment
- Excellent planarity
- Stable Contact Resistance (Cres)

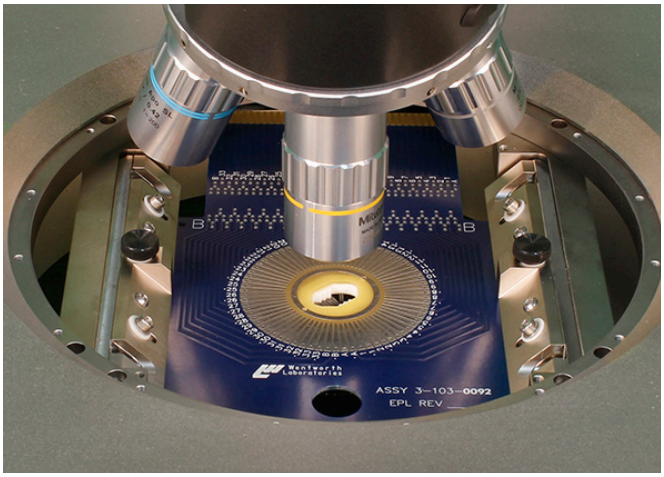
KEY FEATURES

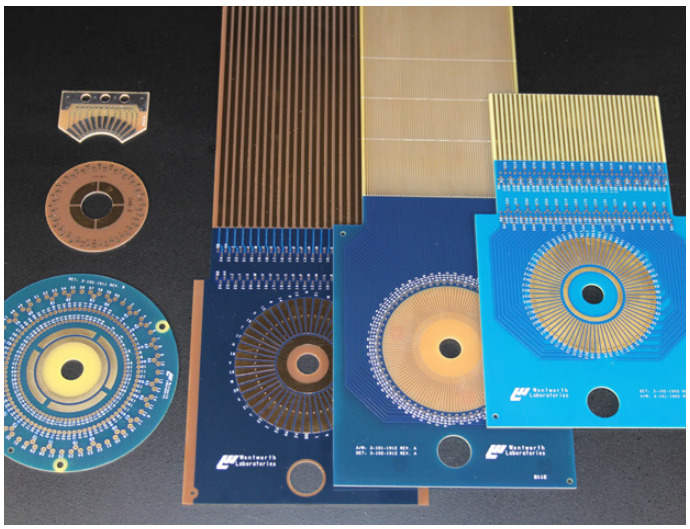
- Covering temperature ranges from -271°C (2 Kelvin) to +300°C
- For high voltage up to 10 kV and high current up to in excess of 200 amps (pulsed)
- Low leakage down to femtoamp (fA) range
- Needle materials include tungsten (W), tungsten rhenium (WRe), beryllium copper (BeCu) and palladium alloy (Pd)

APPLICATIONS

Wentworth's dedicated probe card teams are highly experienced in designing and building cantilever probe cards for many applications including high current, high voltage, low leakage, high temperature, cryogenic, radio frequency, multiple die and laser bar testing.

We have experience of building probe cards used to test displays, LEDs, MEMS, flip chip, ceramic substrates, power semiconductors including MOSFETs and IGBTs as well as optical, memory, logic and many other devices. As an ISO 9001 certified company, our professionals work closely with you to support your project from concept right through to completion.





PROBE CARD DESIGN

Central to our probe card design processes is our in-house developed cantilever probe card design software. It ensures all quality requirements including ISO9001 are met consistently by

- Supporting the automated design of key components
- Importing device specific data automatically to create all manufacturing documentation
- Facilitating the automatic programming of key manufacturing equipment and tracking progress through the manufacturing process
- Controlling state-of-the-art micro machining tools

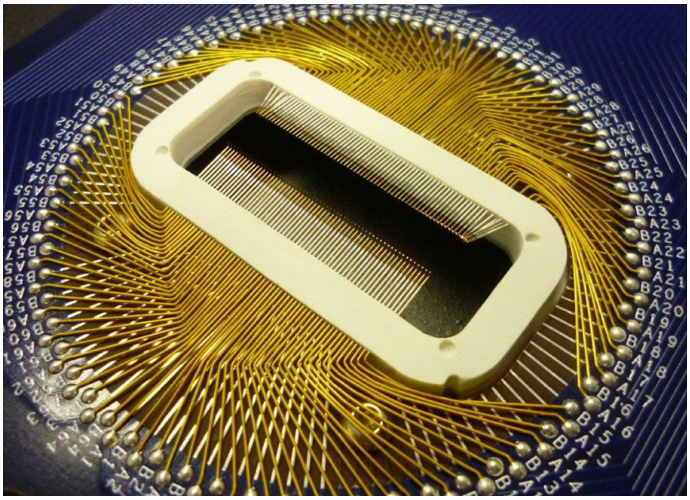
PROBE CARD TYPES

EPOXY

Epoxy probe cards can accommodate a high pin count, and provide a cost-effective solution for most probing requirements. Our standard epoxy cards are suitable for use with chuck temperatures up to 100°C depending on geometry.

A wide range of options including those listed below means that we can tailor each probe card to your specific requirements:

- Number of probes
- Probe and PCB material
- Pitch
- Leakage in the nA and pA range



LOW LEAKAGE

Capable of operating in the fA range at voltages up to 30 V, Wentworth's low leakage epoxy probe cards deliver ultra-low leakage measurements. Achieving small pitches down to 50 µm, they are suitable for a range of operating temperatures with superior performance.

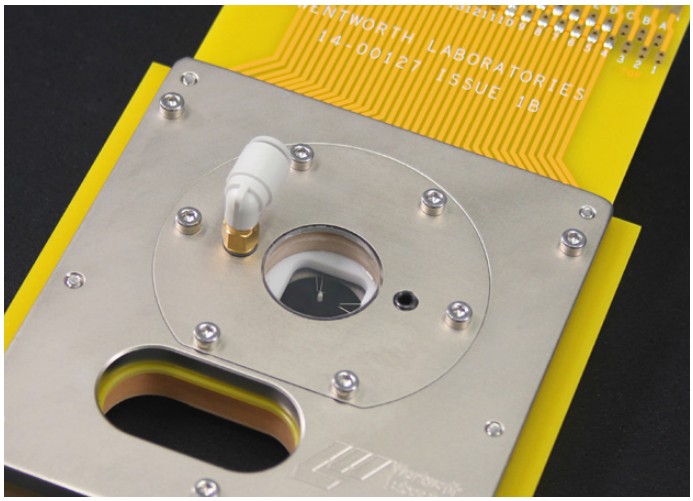
We design low leakage probe cards for use with all major parametric analysers including Keithley and Keysight.

Working with a variety of superior engineering materials, we can accommodate most requirements demanded by specialist applications. We assemble, clean and test our low leakage probe cards to tightly controlled specifications.

HIGH VOLTAGE/HIGH CURRENT

Wentworth's HV/HC epoxy probe cards offer an ideal solution for minimizing the risk of damaging devices or test equipment when probing at high voltages and/or high currents. They are proven to provide reliable performance and can operate at temperatures of up to 250°C.

Our **high voltage probe cards** are designed to withstand up to 10 kV depending on test set-up and are ideal for testing power devices such as IGBTs and MOSFETs. Our **high current probe cards** are capable of operating at up to 200 Amp pulsed current and beyond so they can be used to carry out electrical measurements of high-power discrete devices like power transistors, power diodes, thyristors or high-power amplifiers.



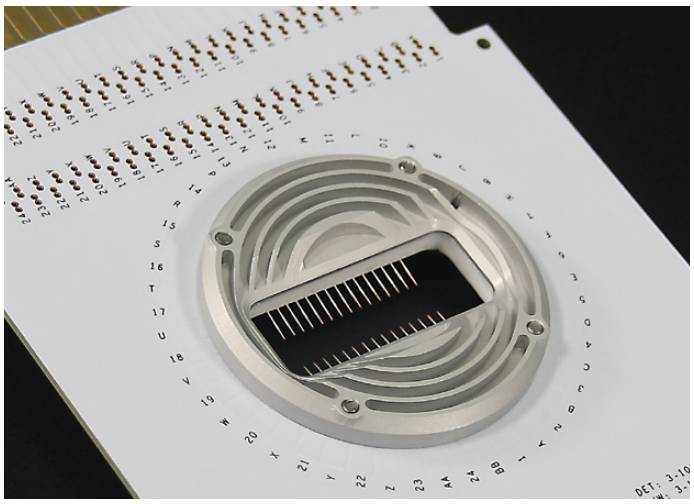
PROBE CARD TYPES

EXTREME TEMPERATURE

Backed by many years of experience of designing probe cards, our extreme temperature epoxy probe cards enable you to carry out electrical characterization of your wafers across a broad range of temperatures.

Our **high temperature probe cards** are ideally suited for use in test environments up to +300°C. They are suitable for hot chuck applications and can also be mounted on manipulators.

Our **cryogenic probe cards** are designed for temperatures as low as -271°C (2 Kelvin). They can be used with specialist low temperature wafer probe stations, but are also suitable for use inside a cryostat.

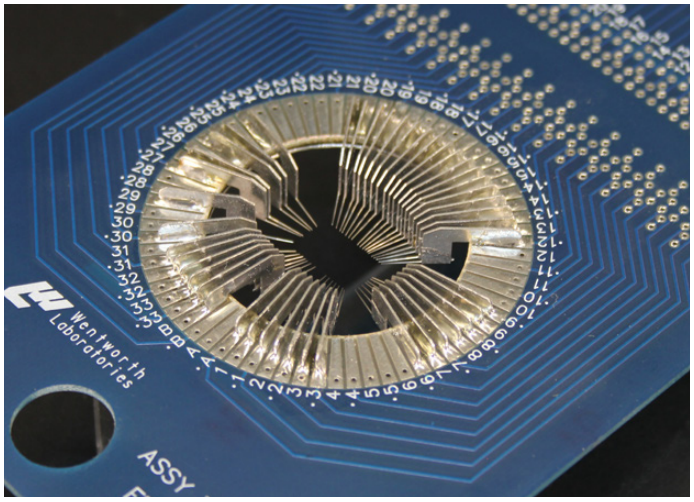


BLADE PROBE CARDS

Blade probe cards can offer a cost-effective solution for less complex wafer test applications.

Thanks to their inherent design, blade probe cards offer good visual and physical access to the device under test (DUT). This makes them ideal for tests which require the use of optics to view the device during probing or where a diagnostic probe is needed in addition to the probe card.

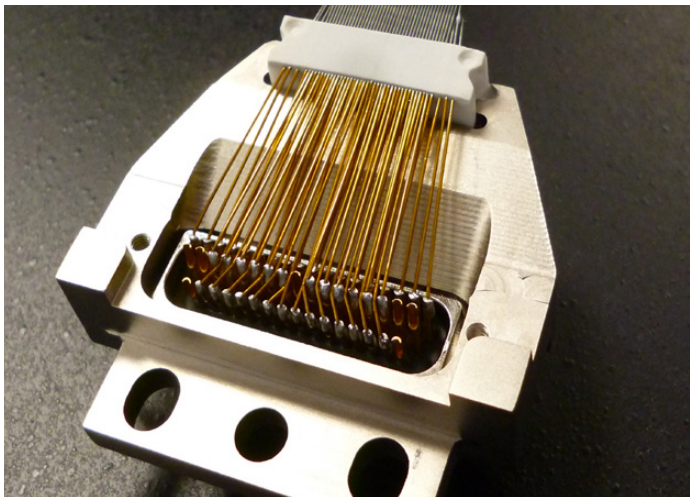
We have the expertise to build brand-new blade probe cards and re-build or repair existing ones. Using high end materials, and pre-assembled parts, we provide quick and low-priced blade card solutions to complement our own wafer probe stations or to be used with other test equipment.



CUSTOM PROBE CARDS

In addition to our ranges of standard epoxy probe cards we design bespoke probe cards to suit your more specific probing requirements. Customization can include any of the following:

- Probe cards for use on a specific (non-Wentworth) wafer probe station without the use of a standard probe card holder
- Probe cards for use on non-standard probe card mounts or test heads such as XYZ manipulators
- Custom PCB layout
- Probe cards for applications requiring testing at extreme temperature with high voltage/high current



BLADE PROBES

As the original inventor and patent holder of blade type probe cards, Wentworth Laboratories manufactures blade probes (also known as needle holder assemblies) for a variety of different applications. These are an essential part for any organisation who wishes to build, or maintain, their own blade probe cards.

Each of our basic blade probe shapes come in several sizes, and can be combined with your choice of needle to provide custom blades to suit your application. We offer solutions to fit standard and custom PCBs. A wide choice of options is available to tailor the blade probe to meet your test requirements.

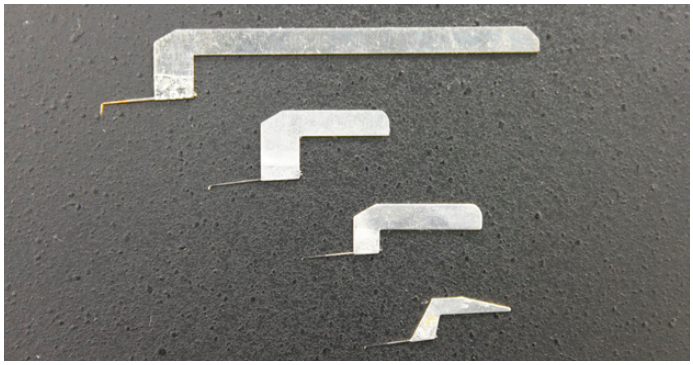
Probe needles are available in the following materials: Tungsten (W), tungsten rhenium (WRe), beryllium copper (BeCu), palladium alloy as well as gold and rhodium plating.

CHOOSE YOUR PARAMETERS

- Material
- Gram force
- Tip diameter
- Tip length
- Tip shape
- Probe extension (beam length)
- Probe plating

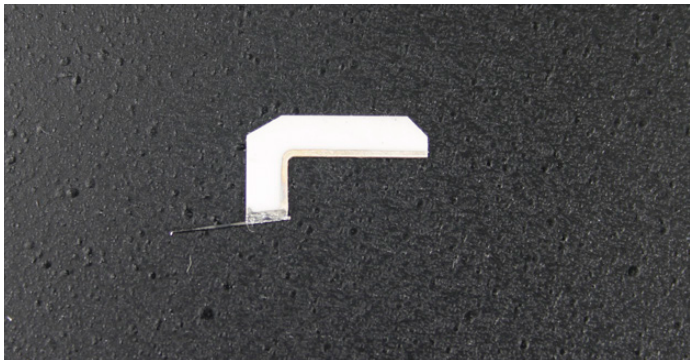
METAL BLADES

Our standard metal blade probes are available in a wide variety of different shapes and sizes. Their robust and stable design makes them suitable for most applications including multi-level probing. We can also provide longer reach blades for custom geometries on boards with wide opening sizes.



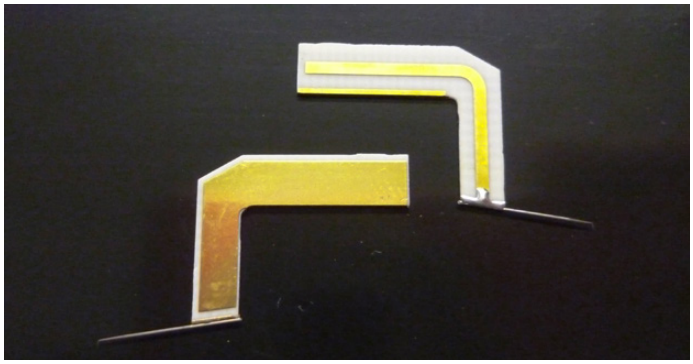
STANDARD CERAMIC BLADES

Our ceramic blade probes are available in two different shapes. Their high rigidity and slim design make them ideal for higher density applications. Thanks to their non-conductive characteristics, they are often used to reduce leakage and noise for parametric testing applications. Traditionally, these types of blade probes are also used in high temperature applications.



STRIPLINE CERAMIC BLADES

We offer three different types of high frequency stripline blades to cater for different applications. With their fixed impedance at 50 ohm, they are specifically designed for high frequency applications up to 4 GHz. They are also ideal for low leakage applications and can achieve values in the femtoamp range.



PROBE CARD OVERVIEW

	PCB material			Chuck/environment temperature		Minimum pitch				Leakage			Current/probe			
	FR4	HTG FR4	Polymide	Min temp	Max temp	25-45 µm	45-60 µm	60-80 µm	80 µm+	nA	pA	fA	Up to 100 mA	Up to 200 mA	Up to 700 mA	Up to 150 A (pulsed)
Epoxy	✓	✓		20°C	100°C	✓	✓	✓	✓	✓	✓		✓	✓		
High temperature		✓	✓	40°C	300°C		✓	✓	✓	✓	✓		✓	✓		
Cryogenic/low temperature epoxy			✓	-271°C	20°C		✓	✓	✓	✓	✓		✓	✓		
High current (kV probing)			✓	20°C	250°C				✓	✓			✓	✓	✓	✓
Low leakage epoxy	✓	✓	✓	20°C	80°C	✓	✓	✓	✓		✓	✓	✓			
Short beam-shielded signal epoxy	✓	✓	✓	20°C	180°C	✓	✓	✓	✓		✓		✓			
Double-sided epoxy	n/a			20°C	80°C		✓	✓	✓		✓		✓	✓	✓	
Blade	✓			20°C	80°C			✓	✓	✓	✓		✓	✓		
ACS Stripline blade	✓	✓	✓	20°C	80°C			✓	✓			✓	✓			

The above specifications are for guidance only. Individual probe card performance depends on many factors — contact us for specific requirements.

BUILDING YOUR OWN PROBE CARDS

If you are looking to build or maintain your own probe cards, we also offer probe card manufacturing equipment, printed circuit boards and an extensive range of metal and ceramic blade probes.

ABOUT WENTWORTH LABORATORIES

With over 50 years' experience in wafer probing technology, our solutions are the number one choice for many leading-edge wafer test applications across the globe.

With the support of a world-wide network of representatives, we enable our customers to fulfil even the most challenging wafer probing goals, maximizing their productivity and reducing costs.

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