

MICRO-DERM®

Plating and Coating Thickness Testing Instrumentation



- Beta-backscatter measuring technique
- In compliance with ASTM B567, ISO/DIS 3543 and DIN 50 983 Specifications
- Measures many typical thickness applications, including gold on nickel, copper on epoxy, photoresist, silver on copper, tin on kovar, titanium nitride on steel, tin-lead alloys
- MicroDerm MP-900 can measure nickel thickness on copper using the Hall Effect technique
- Probe systems are designed for precise measurement on a variety of surfaces, from small parts (connectors and pins) to large parts (printed circuit boards)

- Micro-Derm BBS thickness standards (4 point sets) consist of a bare sample of base material, a sample of infinitely thick coating material, and two thickness standards certified traceable to NIST (National Institute of Standards Technology)
- Each measurement system comes complete with a benchtop measuring instrument, a measuring probe and guide, and thickness standards
- High quality manufacturing ensures the most accurate plating and thickness readings possible
- Designed for unmatched ease-of-use and efficiency

Veeco® UPA Technology
We make the process more productive.™

TESTING INSTRUMENTATION



Micro-Derm® MP-900

Only the MP-900 combines beta-backscatter and Hall-Effect measuring techniques, eliminating the costly need for two separate instruments.

- Compact design
- Comprehensive measuring capabilities
- Economical alternative to X-Ray fluorescence machines
- Boosts throughput
- 45 non-volatile calibration memories allow user to instantly switch applications
- Unique NOVRAM design maintains valuable calibrations without battery back-up
- Standard calibration modes: 4-point, 3-point, 2-point, linear, multipoint, and Sn-Pb.
- Special multi-point tin-lead calibration mode automatically compensates and corrects for different tin-lead compositions.
- New 3-point BBS mode eliminates need for "infinite" coating standards
- Multi-point calibration mode for Hall-Effect measurements



Micro-Derm® MP-700

The MP-700D accurately measures the thickness of coatings and platings such as gold, silver, rhodium, tin, tin-lead, copper, nickel, photoresist, aluminum, palladium, and titanium-tungsten.

- Measurement can be made on any part
- 16 non-volatile calibration memories
- Two probe inputs allow user to switch applications with ready-to-use probes
- Easy-to-read display prompts operator through procedure, eliminating errors
- LED read-out displays measurements in microinches, micrometers, mils, angstroms, percent composition, etc.
- Standard features include automatic diagnostic test, error detection, RS-232C output port

MICRO-DERM® Specifications

	MP-900	MP-700		MP-900	MP-700		MP-900	MP-700
Nonvolatile Application/Calibration Memories	45	16	Statistics: Mean, standard deviation, percent uncertainty (actual), normalized counts, number of measurements	YES	YES	Voltage Input: 110/120/220/240 ± 10%; 50/60Hz	YES	YES
Probe Inputs	4-BBS 1-Hall Effect	2-BBS	Statistics: Percent uncertainty (predicted), count rate, percent composition, constants A & B	YES	YES	Fuse Rating 100/120V 1/2 ASB 220/240V 1/4 ASB	YES	YES
Display-4 digit LED Numerals 0.43" (1.1cm) in Height	YES	YES	Histogram Printout	YES	YES	Power Consumption	45W	45W
Readouts: Microinches, micrometers, mils, Angstroms, percent composition, count rate	YES	YES	Built-in Self-test Diagnostics Program	YES	YES	Probe Lamp Output	YES	YES
Built-in High Speed AlphaNumeric Electrostatic Printer	YES 28 char.	YES 28 char.	Microprocessor-based Circuitry	YES	YES	RS-232C Output	YES	YES
						Basic Unit: Weight 14 lbs. (6.4kg); Size 17" x 12" x 4" (43.2 x 30.5 x 10.2cm)	YES	YES

PROBES, GUIDES and ACCESSORIES



PS-10A Probe System

For Measurements on Small Parts

This compact, lightweight probe system is specifically designed for measuring small electronic components such as I.C.s, lead frames, transistor headers and leads, flat packs, relays, terminals, pins, diodes, connectors, contacts, wires, etc.

The Model PS-10A uses a special large diameter G-M tube for high accuracy and improved statistical performance. The G-M tube detects the beta particles reflected from the coating measured, and transmits the impulses to the Micro-Derm instrument where the signal is translated into a thickness and read out on a digital display.

Interchangeable Source / Aperture Assemblies

A unique source ring and aperture plate assembly ensures simple interchangeability of a large variety of source-aperture

combinations for measurements on almost any type of small part.

Many sizes and types of aperture plate configurations are available to precisely define the measurement area. Each source is mounted with the customer specified aperture plate to form modular source/aperture assemblies.

Aperture plates are made of wear-resistant hardened stainless steel and are available with either circular or rectangular openings. Parts to be tested are placed over the aperture plate opening and a spring-loaded pin holds the part firmly in place.

Typical Hardened Stainless Steel Aperture Plates



Rectangular
.010-2-3 S (.25-1.6)
.010-3-3 S (.25-2.4)
.014-2-3 S (.36-1.6)
.014-2-3 S #350 (.36-1.6)
.014-3-3 S (.36-2.4)
.020-2-3 S (.51-1.6)
.020-3-3 S (.51-2.4)
.025-3-3 S (.64-2.4)
.035-3-3 S (.89-2.4)
.045-3-35 (1.14-2.4)

Circular
.010 DS (.025)
.014 DS (.036)
.020 DS (.051)
.031 DS (.08)
.056 DS #395 (1.4)
.062 DS (1.6)

Aperture Nests

For difficult to position parts, UPA provides custom made aperture-nesting fixtures. Nesting fixtures allow easy positioning of parts such as flat lead frames, small contacts, leads, etc. The complete assembly consists of a precision aperture plate matched to a part-holding nesting device.

Our Applications Engineers will be pleased to review your specific requirements.



Guide Model CB-5

For Measurements on Printed Circuit Boards

The new patented circuit board Guide Model CB-5 measures surface plating thickness on printed circuit boards with unprecedented speed and accuracy.

Through its unique optical positioning system, the CB-5 easily locates and positions the HH-3 Measuring Probe (see back page) on small circuit board areas. Place the CB-5 on the board, and the exact area to be measured is illuminated on the PCB... no need to line up crosshairs!

Unique, interchangeable light spot reticles correspond exactly to the size and shape of the measuring probe's specimen mask opening, which clearly defines the measurement area on the PCB.

Since the CB-5 Guide can be moved to any part of a printed circuit board surface, it can make measurements even in the center of the very largest PCB's. Probes may be instantly interchanged in the CB-5 by using the G-3 clamp included with each HH-3 probe system.

Micro-Derm® PROBES and GUIDES



HH-3 Probe with C-3 Clamp and Replacement Probe Barrel MB-3.

HH-3 PROBE

A self-contained probe system consisting of a Probe Barrel (MB-3) containing the beta source (Pm, Ti, Sr), Geiger-Müller (G-M) tube, and a specimen mask.

This versatile probe can be used with any one of several probe guides and stands, and enables measurement on almost any size or shape part such as PCB's, cylinders, sheet stock for canning, flat sheets, chassis and small parts.

HH-4 PROBE

A complete, self-contained probe system that enables measurements of plating and coating on curved or flat internal surfaces as small as 0.5" (127 mm) I.D. The unique configuration allows the beta particles to be emitted through an opening on the side of the probe. The thickness of gold, rhodium, silver, graphite, tin-lead and other coatings can be measured on the inside surfaces of bearings, rings, tubes, waveguides, cylinders, etc. Guide I.D. is used with the HH-4 probe system.



HH-4 Probe is ideal for inside surface measuring.



TR-1 Probe System for non-contact measurements

TR-1 PROBE SYSTEM

Used to measure the thickness of compact and hard disks (CD's), foils, tapes, silicon wafers, etc. The sample being measured is placed between the beta-source and G-M tube detector. Measurements with the TR-1 are non-contacting, which allows continuously moving foils or tapes to be measured. Requires Type T source (Pm, Ti, Sr).



SMALL PARTS GUIDE SPG-1

This guide is for positioning the HH-3 Probe for measurements on small electronic components such as connectors, pins, lead frames, wires, flatpacks and contacts. A sample holding pressure pin holds the part securely. This guide enables the same standard HH-3 probe to be used in measurements on both large surfaces and small parts.

Our expert applications engineers will be pleased to help you select the components best suited to your specific measurement applications and needs.

THICKNESS STANDARDS

APPLICATION COATING/ BASE	NOMENCLATURE SOURCE	UPPER MEASUREMENT LIMIT	
		British Microinches	Metric Microns
ALUMINUM/Kovar	Al/Kvr-Pm	1300	33
	Al/Kvr-Ti	7500	190
CADMIUM/Copper, Nickel or Brass	Cd/Cu-Pm	220	5.6
	Cd/Cu-Ti	1600	41
NICKEL/Steel	Co/Fe-Pm	200	5.1
	Co/Fe-Ti	1500	38
CHROMIUM/Copper	Cr/Cu-Pm	335	8.5
	Cr/Cu-Ti	1700	43
COPPER/Aluminum	Cu/Al-Pm	240	6.1
	Cu/Al-Ti	1700	43
	Cu/Al-Sr	5500	140
COPPER/Aluminum Oxide	Cu/Al ₂ O ₃ -Sr	5000	127
COPPER/Beryllia	Cu/BeO-Sr	5000	127
COPPER/G ₁₀ (Epoxy)	Cu/G ₁₀ -Pm	250	6.4
	Cu/G ₁₀ -Ti	1500	38
	Cu/G ₁₀ -Sr	5500	140
GOLD/Aluminum, Alumina, Beryllia, Silicon	Au/Al-Pm	85	2.2
	Au/Al-Ti	420	10.7
GOLD/Kovar, Steel Invar or Stainless Steel	Au/Kvr-Pm	90	2.3
	Au/Kvr-Ti	500	12.7
GOLD/Nickel, Copper, Brass or Phosphor Bronze	Au/Ni-Pm	90	2.3
	Au/Ni-Ti	500	12.7
	Au/Ni-Sr	1600	41
GOLD/Silver	Au/Ag-Pm	92	2.3
	Au/Ag-Ti	500	12.7
GOLD/Tin-Nickel	Au/Sn-Ni-Pm	95	2.4
NICKEL/Aluminum	Ni/Al-Pm	240	6.1
	Ni/Al-Ti	1700	43
PALLADIUM/Nickel	Pd/Ni-Pm	160	4.1
PHOTORESIST/Copper	KPR/Cu-Pm	350	8.9
	DPRI/Cu-Pm	550	14
RHODIUM/Gold	Rh/Au-Pm	180	4.6
RHODIUM/Nickel, Copper or Brass	Rh/Ni-Pm	120	3.0
SILVER/Alumina	Ag/Al ₂ O ₃ -Sr	3000	76
SILVER/Copper, Nickel or Brass	Ag/Cu-Pm	185	4.7
	Ag/Cu-Ti	1100	28
	Ag/Cu-Sr	3300	84
SILVER/Kovar, Steel Invar or Stainless Steel	Ag/Kvr-Pm	185	4.7
	Ag/Kvr-Ti	1050	27
	Ag/Kvr-Sr	3300	84
SOLDER/Copper (60% tin/40% lead)	Sn-Pb/Cu-Pm	210	5.3
	Sn-Pb/Cu-Ti	1250	32
	Sn-Pb/Cu-Sr	4400	112
COMPOSITION of Electroplated Solder	%Sn-Pb-Pm	80%Pb	80%Pb
TIN/Copper, Nickel or Brass	Sn/Cu-Pm	290	7.4
	Sn/Cu-Ti	1700	43
TIN/Kovar or Steel	Sn/Kvr-Pm	290	7.4
	Sn/Kvr-Ti	1650	42
TIN-NICKEL/Copper, Nickel or Brass	Sn-Ni/Cu-Pm	240	6.1
	Sn-Ni/Cu-Ti	1175	30

Listed are the most frequently used Micro-Derm calibration thickness standards. Contact UPA Technology for information/ordering details on any coating/base application not listed.