Probe Form™

Product Bulletin

Probe Form™ on an Abrasion Plate

Probe Form™ was developed for cantilevered probe technologies to provide a cost effective method of uniformly "reforming" a flat probe tip into a radius shape with a smooth contact surface. **Probe Form™** uses a highly cross-linked, non-corrosive polymer that was designed aggressive enough to remove probe material.

Probe Form™ shaping operation can be easily incorporated into a probe card build process to "form" radius tips or into a probe card maintenance cycle to restore worn or deformed probe tips. To facilitate these operations, **Probe Form™** is available on a number of different substrates readily used by wafer prober and some probe card analyzers.

GENERAL

Probe Form™ is formulated to change the shape of the probe tips. The forming product is designed to reduce the size of the probes when they are inserted into the material for a series of several touchdowns. The rate of tip reshaping depends on the initial diameter, the probe needle material (i.e., tungsten, tungsten-rhenium, beryllium-copper, and Pd-alloy probes will be reshaped at different rates) and the grade of **Probe Form™** which can be used for "rough-cut" or polish the probe tip.

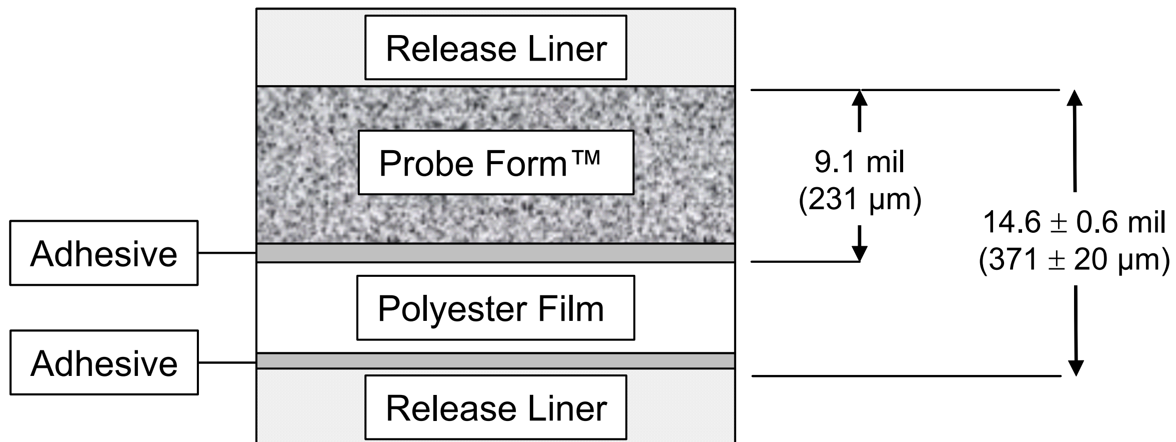
The primary reshaping action with **Probe Form™** occurs during a Z-axis (up and down) motion into the polymer material. During the probe tip reshaping operation, no lateral loads or excessive vertical force to the probe (< 3 g/mil) are applied to the probes and the probe card planarity and alignment are unaffected. In fact, the forces exerted on the probe when reshaping will be substantially less than those of normal testing operations.

To maximize the tip size reduction and development of a highly polished radius shape, the probes are inserted into new locations of the polymer with an offset of approximately 2X the probe diameter in the X and Y directions, giving consideration to the probe array size and orientation.

CROSS SECTION

Probe Form™

Nominal Stack Height = 14.6 ± 0.6 mil (371 ± 20 µm)



Probe Form™ *is a registered trademark of International Test Solutions.*

International Test Solutions

1475 Terminal Way | http://www.inttest.net | Tel: 775-284-9220

Reno, NV 89523 USA | sales@inttest.net | Fax: 775-284-9227

RECOMMENDED SETUP

1. Install the **Probe Form**™ on the abrasion plate.
   a. Remove back protective cover to expose adhesive.
   b. Place the **Probe Form**™ on abrasion plate starting at one edge and press it into place to exclude all air pockets that may get trapped between the two surfaces. Ensure the top surface is flat and smooth.
   c. Use a piece of transparent tape to touch the edge of the protective cover. Peel the front protective cover from the sample. Take care not to lift the **Probe Form**™ material from the contact surface of the abrasion plate.

      USE EXTRA CARE NOT TO TOUCH THE WORKING SURFACE WITH THE SCOTCH TAPE AS IT MAY REMOVE THE PROBE FORM™ FROM THE POLYESTER SUBSTRATE.
   d. Store the protective cover for later installation on the sample, if required.
2. Calibrate the prober cleaning unit height and modify the cleaning utility program to overdrive into the abrasive polymer.
   a. Set the surface height of the polymer as the "new cleaning height" for the abrasion plate (polymer is non-conductive). The calibration procedure is defined for each prober equipment manufacturer. Please reference the proper calibration procedure to set the new height of the abrasion plate or cleaning unit "with the polymer added". Do not proceed beyond this point without first performing the cleaning unit calibration.
3. Modify the prober operation settings to move over the entire surface area, ensuring that the probe array remains within the **Probe Form™** surface area.
   a. International **Test Solutions** recommends that the probe tip is inspected and tip diameter is measured after every 250 touchdowns to determine a rate of material removal.
   b. Most customers have observed significant tip changes in less than 1000 touchdowns. The rate of tip reshaping depends on the initial diameter, the probe needle material and, most importantly, the grade of **Probe Form™**.
   c. Offset the touchdown point by at least 2X the probe diameter in the "±Y" direction and 2X the probe diameter in the "±X" direction each touchdown. For example, 25 µm (1 mil) probe diameter is offset 50 µm (2 mil) in the "X" direction and 50 µm (2 mil) in the "Y" direction.
   d. By continuing the offset each touchdown a pattern can be developed which will fully utilize the entire cleaning surface.
   e. Repeating the touchdown pattern in an area of the wafer that has been used may result in reduced reshaping efficiency.
   f. In order to realize the full forming properties, each touchdown should be in a new location on the wafer.
   g. By changing the grade of **Probe Form™** a radiused tip with a highly polished contact surface can be obtained.

Contact **International Test Solutions** at 775-284-9220, or via email at techsupport@inttest.net, to discuss your specific probe card cleaning or tip shaping application and requirements.

Probe Form™ *is a registered trademark of International Test Solutions.*

International Test Solutions

1475 Terminal Way
Reno, NV 89523 USA

http://www.inttest.net
sales@inttest.net

Tel: 775-284-9220
Fax: 775-284-9227