# M100A Spray Coatings: Metal to Metal Applications

**Model 100 Metal Inspector** uses resistivity, a basic principle of electronics, to quickly and accurately measure the thickness of conductive coatings sprayed on metal surfaces. This nondestructive resistivity testing technique also helps you locate and "size-up" areas where hidden voids, inclusions, or poor adhesion conditions may exist.

## An "On-Site" Device That Eliminates Guesswork

Because the Model 100 is battery-operated, portable and weighs only about 10 lbs., it is ideal for on-site inspection to determine if proper coating thickness has been achieved. And because the Model 100 generates individual test readings in less than two seconds, it permits rapid inspections of large areas of coating. The Metal Inspector helps reduce the guesswork involved in coating applications and helps eliminate the need for destructive quality checks.

## How It Works

The Metal Inspector pulses a rapidly reversing direct current into conductive materials through a trigger-activated hand probe. If you place a probe tip squarely down on an uncoated metal substrate and take a reading, you will get a resistivity measurement. This is called a "base" reading.

If the substrate is spray coated and tested again with the Metal Inspector, a different resistivity will be measured. This is the "coating" reading.

The difference in resistivity between the "base" and "coating" readings can be correlated to coating thickness through destructive testing, provided that the resistivity of the coating and the metal substrate are different.

## Developing a Correlation Curve

Because each type of metal substrate and coating material may have significantly different resistivities, development of a simple correlation curve for each application is necessary. The following sample procedure can be used:

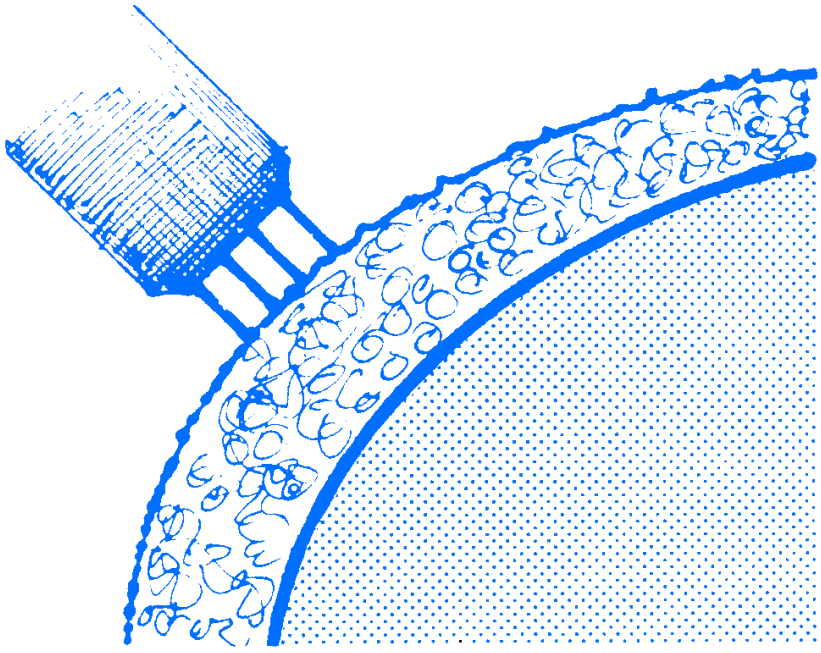
(1) **Select the proper probe cartridge**. This is an important first step in any application. Probe pin spacing controls the depth of electrical current penetration. Penetration is about 1.5 times the pin spacing. We use this guide:

| Probe Cartridge | Max. Coating Depth |
|---|---|
| .050 inch | .075 inch |
| .100 inch | .150 inch |
| .175 inch | .262 inch |
| .250 inch | .375 inch |

(Typically, the .050 inch or .100 inch probe cartridges are best for most coating applications. Current penetration should be at least as deep as the thickest area of coating. Each probe requires its own correlation study.)

**(2) Turn the Model 100 on and press the "Index and Test" button on the face plate**.

**(3) Take a "Base" reading on an uncoated metal sample**. Hold the probe down on the metal, keeping the trigger depressed. Turn the adjustment knob beneath the "Index" button until the display reads "100."



**(4) Take readings on a coated sample.** In most cases your readings will be greater than the base reading of 100. Readings greater than 100 are typical of applications in which high-resistivity, corrosion/thermal coatings are applied to low-carbon steels. However, in some applications, particularly in which steels are being plated with lower resistivity materials, such as chrome or gold, your readings will be less than 100.

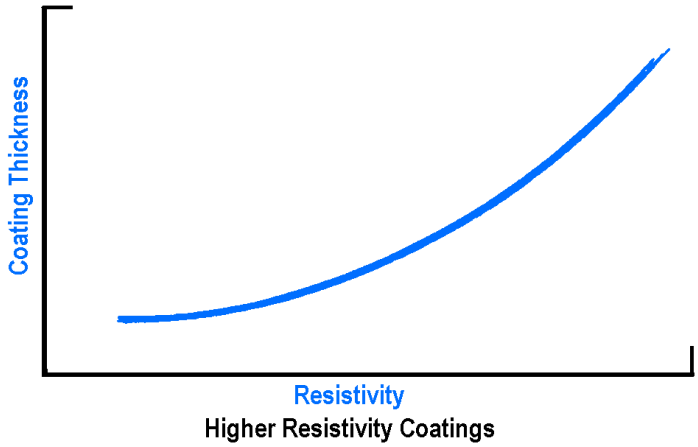
**(5) Record the readings and mark where each was taken on the sample.**

**(6) Cut the coated sample into sections and polish**. Then measure the coating thickness at each Model 100 reading location.

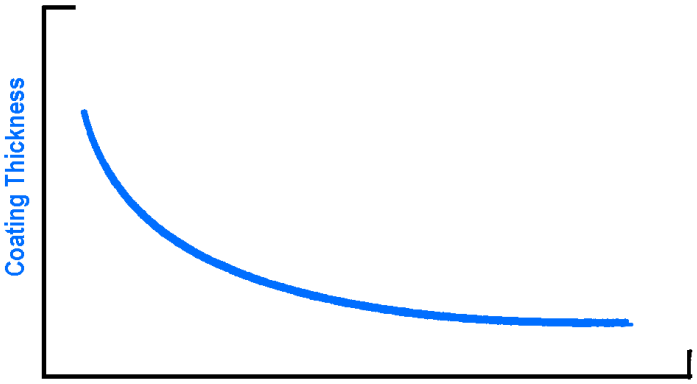
**(7) Plot the results on a graph.** The coating thickness on the Y-axis and the Model 100 readings on the X-axis.

**(8) Test other similar coated samples.** After establishing correlation values through experience, you should expect a Metal Inspector reading to be within .005 inch of the actual coating thickness at the test location.

If your results are erratic, perform another correlation study using a different probe cartridge, or call for assistance at 609-716-4000, fax: (609) 716-0706, or e-mail us at sales.systems@mistrasgroup.com.



Higher Resistivity Coatings



Lower Resistivity Platings

195 Clarksville Road, Princeton Junction, NJ 08550 USA
Phone: (609) 716-4000 • Fax: (609) 716-0706
Email: sales.systems@mistrasgroup.com • www.mistrasgroup.com