



MikroTest[®]

Magnetic coating thickness testing gauge

Operating Instructions for

MikroTest[®] 5 standard

MikroTest[®] 6 automatic

DIN 50 981, 50 982

ASTM B499, E367, D1186, G12, B530 BS 5411

DIN EN ISO 2178, 2361

ElektroPhysik

Advancing with Technology

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Applications

MikroTest® coating thickness gauges utilize the magnetic attraction principle. They are commonly referred to as “Pull-Off” gauges, “banana gauges” and are classified as Type I instruments.

MikroTest® Type G, Type F and Type S are designed to measure the thickness of all non-magnetic coatings such as paint, chrome, copper, rubber etc. on steel*.

MikroTest® Type NiFe are designed for measuring electroplated nickel on steel* and MikroTest® Type Ni are designed for electroplated nickel coatings on non-ferrous substrates.

The MikroTest® Zn/Fe is designed for measuring galvanized coatings displaying weight converted values as a function of thickness.

*The steel substrate should be commercial un-hardened steel (St 33 to St 60 or C 15 to C45)

MikroTest® gauges are designed to measure the thickness of coatings applied over flat as well as round or curved surfaces (see technical table for limitations). Measurements can be taken at any angle including overhead surfaces.

The MikroTest® is available in a Type 5 standard version and a Type 6 automatic version. Identify the version you are using and follow only those instructions for taking measurements.

If you have any questions regarding the operation of your unit, please contact your dealer or call **ElektroPhysik USA Inc.**, for assistance.

Before taking a measurement

Type 5 and Type 6 models

Inspect the gauge to make sure the tip of the magnet is clean and free of oil, dust, metal chips or paint that may have transferred onto the magnet from prior measurements. If cleaning is required we suggest using a piece of adhesive tape or a soft brush to remove any materials that may have transferred onto the magnet.

Next make sure the substrate meets the minimum thickness and area of measurement requirements for that particular model.

It is recommended that you verify the unit is operating properly by taking a measurement on a control standard which has a stated known value. **ElektroPhysik** manufactures control standards in various thickness ranges. Do not use plastic shims or foils.

Taking the measurement

Type 5 standard models

Place the MikroTest® on the surface to be measured. Turn the scale wheel forward past the estimated thickness of the coating you will be measuring. If the magnet has not set in this process, push and release the button located on the underside of the gauge and the magnet will then set.

With either your thumb or index finger, slowly turn the scale wheel backwards until you hear a click from the magnet releasing from the coated surface. **DO NOT TURN FURTHER!** You now can read the coating thickness off the scale .

Type 6 automatic models

Caution: Type 6 models have a special mechanism designed into the unit which eliminates the need to turn the scale wheel in order to take a reading. The scale wheel can only be turned counter clockwise (rotating forward) when viewing the scale. Rotating the scale wheel clockwise (pulling it backward) will damage the unit.

Place the MikroTest® on the surface to be measured.

Turn the scale wheel forward to the stop. The magnet will now adhere to the surface. If the magnet did not set in this process, push the button located on the underside of the gauge and the magnet will then set, then release the button. The scale will now begin turning back by itself automatically and will stop by itself when the magnet lifts off the coating. You can now read the coating thickness value off the scale.

All Models

The coating thickness should always be determined from several readings to arrive at an average. The average should be read in conjunction with the tolerance shown in the technical data.

example:

**The true coating thickness = average of readings +/- tolerance
2.25 mils +/- 5%**

true thickness of the coating is between 2.14 mils and 2.36 mils

Flat surfaces - the position of the measuring surface has no influence on the result. Note the information in the technical data section with regard to minimum area and base thickness.

All Models

Curved surfaces - when measuring on cylindrical objects or rounded edges place the gauge onto the surface centering the object into the "V groove" in the housing of the gauge. Measurements on concave surfaces are made as on a flat surface but note the information on minimum curvature in the technical data table.

Rough Surface - with measurements of coatings applied on rough surfaces such as castings or shot blasted surfaces have a higher value than the thickness over the peaks.

On very rough steel surfaces (PV = 2 mil or more) and coatings thicker than approx. 4 mils, the actual reading can be up to 20% higher than the true thickness over the peaks.

In this case the average of at least six readings must be taken.

More detailed information on rough surface influences on coating thickness readings is available upon request.

Other Products:

ElektroPhysik Manufacturers a full range of portable coating thickness gauges which include the eXacto, MiniTest 600 Series, the MiniTest 4100 Series, QuintSonic and GalvanoTest.

In addition **ElektroPhysik** also offers viscosity, color and appearance testing devices as well as physical test devices for coating quality control.

ElektroPhysik.....manufacturers of precision surface testing gauges

MikroTest® Technical Data

Model	GM	FM	SM3	SM5	SM10	Zn/Fe
Type	5 & 6	5 & 6	6	6	6	6
Scale Range	0 - 4 mils	0 - 40 mils	8 - 120 mils	20 - 200 mils	100 - 400 mils	0 - 2 oz/ft ²
Measuring Tolerance	0.04 mils or ±5% of reading	0.20 mils or ±5% of reading	±5% of reading	±5% of reading	±5% of reading	0.02 oz/ft ² or ±5% of reading
Minimum dia. area of measure	0.80"	1.20"	1.20"	2"	2"	2"
Minimum Curvature	0.20"	0.30"	0.60"	0.60"	0.60"	0.60"
Radius	Concave 1.6"	Concave 1.6"	2"	2"	2"	2"
Minimum Substrate Thickness	.040"	.040"	.060"	.060"	.080"	.040"
Operating Temperature range for all types: -4° to 212° F (-20° to 100° C)						

Measuring Tolerance based on using ElektroPhysik standards where N.I.S.T. standards are not available
Metric equivalent models available
MikroTest coating thickness testing gauges are manufactured by ElektroPhysik in Koln Germany
1 mil = 1/1000" = .001" 1 mil = 25.4 microns

Maintenance

Always keep the gauge away from permanent or electromagnets and strong magnetic fields. After use always put the gauge back in its case. Special maintenance is not necessary. Even though these gauges are very durable and intended for shop floor and field use, they should be handled with care as is the case with any measuring instrument.

Service

Faulty or damaged MikroTest® gauges should be sent prepaid directly to: **ElektroPhysik** 770 W. Algonquin Road, Arlington Hts, IL 60005
Ph: 847-437-6616 Fax: 847-437-0053 email: epusa@elektrophysik.com

EPUSA 01302004



Fig. 1

Interpreting the scale

The various scale ranges & models offered by ElektroPhysik provide varying degrees of detail, be sure you have selected the appropriate model for your application.

Note: the scale should be read straight on and not at an angle.

Figure 1. above shows the scale line has fallen between two sub-hash marks. Each sub-hash mark between the 1 mil and 2 mil hash marks are .20 mils. The scale line is between .60 mils and .80 mils and appears to fall just past the half way point between the sub-hash marks so it can be interpreted that the coating thickness reading in this example is 1.72 mils ± the gauge tolerance.

Scale interpretation can be an additional error element of the assessment of the true coating thickness. **ElektroPhysik** offers digital versions of MikroTest® that eliminate that factor.

Warranty

All MikroTest® gauges are factory calibrated using traceable standards. **ElektroPhysik USA Inc.** warrants that any merchandise sold be free from defects in material or workmanship under normal use, for a period 1 (one) year from the date of purchase.

In the event that a defect in any merchandise sold under this agreement is discovered within one year from the date of sale, the obligation of **ElektroPhysik** shall be limited solely to the repair or replacement at the option of **ElektroPhysik USA Inc** of such merchandise, or any part or part there of, which shall prove to be defective upon inspection by **ElektroPhysik**.

Any signs of attempted repairs, field calibration or serial number tampering could void all warranties.