

Measurement Procedure

Set up and calibration:

Note: The battery pack comes uncharged and must be charged before you use the Microgroover. **Warning:** Non-U.S. power systems require a step-down transformer.

Position and tighten the tip securely in place. It should extend from the mouth of the chuck by exactly 1-7/64". Verification of the positioning may be performed on painted panels previously measured with the Tooke Paint Inspection Gage, using standard tips. If an adjustment is needed, loosen the chuck and move the cutter inward or outward as required.



Setting the tip

Creating the groove:

Incision is performed by pivoting the assembly on the **circular plastic rim** until the rotating tip makes contact with the work surface. Light contact should suffice, while holding the grinder with sufficient firmness to prevent "walking," as shown in Figure 1.

The cutting angles (slopes) of 1x, 2x and 4x are accomplished by using the Positioning Block to elevate the contact shoulder of the Microgroover as required (see Figures 2 and 3). The required shoulder elevations are as follows:

- 1x 0.97" (block resting on narrow face)
- 2x 0.41" (block resting on wide face)
- 4x 0.00" (block not used)



Figure 2. Positioning block shown for the 1x cutting angle.



Figure 1: a 4x angle



Figure 3: A 2x angle.

Inspection and calculation:

When the incision is examined with the Tooke Paint Inspection Gage microscope, it will appear as a partial cylindrical cavity, with the cavity wall angling gradually upward to the paint surface. Where the wall of the cut penetrates the substrate (metal) surface, the paint film above describes a crescent shape. The crescent shape is the cross-hatched part of the Figure 4 drawing. The correct thickness will be read axially across the thickest portion of this shape.

Counting the number of graduations (hashmark spaces) of the microscope reticle within this zone, the observed thickness for the 1x, 2x, or 4x position of the grinder will be divided by 1, 2, or 4 respectively; in the example shown in Figure 4, Counting 11 hashmark spaces, the coating measures and with the current universal microscope (marked in metric units):

- ❑ 11 hashmark spaces ÷ 1 = 279.4 microns (11 mils)
- ❑ 11 hashmark spaces ÷ 2 = 139.7 microns (5.5 mils)
- ❑ 11 hashmark spaces ÷ 4 = 69.9 microns (2.75 mils)

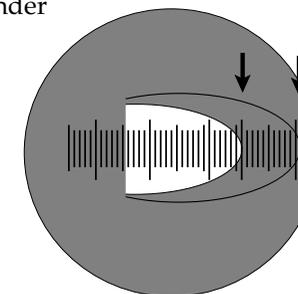


Figure 4. Drawing of cut

Configuration:

Cutting tip configurations of various types are available, in addition to the items supplied with the Microgroover. Tungsten Carbide Cutter No. 9902 is the standard tip supplied with the Microgroover.

Other information:

Please refer to the enclosed Dremel Owner's Manual for further instructions and Dremel Limited Warranty.

Shipping Unit

The Micro-Metrics Microgroover comes complete with charger, spare battery pack, leatherette carrying case, cutting tools and special accessories for thickness measurement preparation, and with this Technical Data Sheet.



Specifications

- Grinder Unit: Dremel 7300-N/8 MiniMite Cordless Tool
- Motor: 4.8 volt DC; 2 speeds (6,500 and 13,000 rpm)
- Carrycase: Flexible vinylette, 2 "x 2" x 8"
- Battery Pack: Plugs into bottom of grinder and included charger
- Charger: Plugs into **110 volt AC** outlet
- Accessories: Various bits and a Positioning Block
- Shipping Weight: 2 pounds





Micro-Metrics Company Products

4450 Ansley Lane
CUMMING, GA 30040-5252
678-947-3723
www.micro-metrics.com

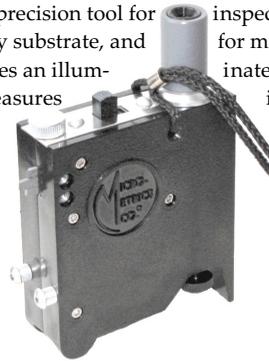
OG204 and OG202 Tooke Paint Inspection Gauge

A precision tool for inspection and thickness measurement (ASTM D4138) of single or multiple coats on any substrate, and for microscopic observation and measurement of substrate and film and film defects. Uses an illuminated 50-power microscope with a "universal" measuring reticle that measures in mils, microns, and millimeters; and mounts three tungsten-carbide cutting tips for precise incision of the surface.

Now, comes in a plastic carry case.

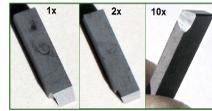
Available in these configurations:

- OG204 polycarbonate plastic
- OG202 machined aluminum



Tungsten-carbide cutting tips

Available in 1x, 2x, 5x, and 10x configurations.



CTH01 and CTH02 Cutting Tip Holders

The Cutting Tip Holders allow easy use of a cutting tip (tip not included) without having to manipulate the Tooke Gauge to make the incision and then manipulate the gauge again to view the incision through the microscope.



H-501 Pencil Hardness Gauge

The Pencil Hardness Gauge is practical for use in the lab, on the production line, or in the field to assess quantitatively the rigidity or firmness (elastic modulus) of organic coatings applied to rigid substrates such as metal. Hardness values may define requirements for particular coatings applications or may be used to evaluate state-of-cure or aging of coating. The provides a compact single unit for performing this test, rather than a set of easily lost individual pencils. Now, with a plastic carry case.



S-701 Thin and S-702 Thick (non-precision) Film Standards

An optico-mechanical gauge such as the Tooke Paint Inspection Gauge, if set up correctly, will not be subject to appreciable calibration change, except by gradual wear of cutters and guide studs. Surface proximity gauges, (magnetic, inductance, or eddy current types) generally require calibration before any series of measurements. The most reliable means of checking the accuracy of thickness gauges is using film thickness standards.



Micro-Metrics Company MG402 Microgroover Technical Data Sheet

Description and Uses

The Micro-Metrics MG402 Microgroover is the major accessory tool for creating dry film coating incisions for film thickness measurements with the Tooke Paint Inspection Gage (OG202 or OG204). This high-speed rotary tool greatly extends the range of the measuring technique to include almost any coating on any substrate.

For precise and rapid measurements, a "drum mode" of cutting was developed. In this mode the Microgroover is fitted with a tungsten carbide cutter installed in precise position. With the rim of the Microgroover in continuous contact with either the work surface or the Positioning Block, the unit is pivoted until the tip contacts the surface, creating the required incision.

This technique completely eliminates the deformations of coating and substrate which may occur when conventional gage cutting tips are used. The Microgroover is especially effective on hard and brittle (concrete) materials, as well as soft or elastomeric (rubber) substances. In addition, fibrous composites are incised easily and cleanly. Also, small-scale operations of cutting, grinding, sawing, and polishing can be performed with the accessory tips supplied.

Principle

The high-speed cutter "erodes" away surface material in a precise pattern, leaving adjacent and underlying areas totally undisturbed. Hard, brittle, tough, fibrous, tender, or elastomeric materials exhibit clean, non-tearing, controlled disintegration under the rotary cutter.



Micro-Metrics Company
4450 Ansley Lane
CUMMING, GA 30040-5252
www.micro-metrics.com