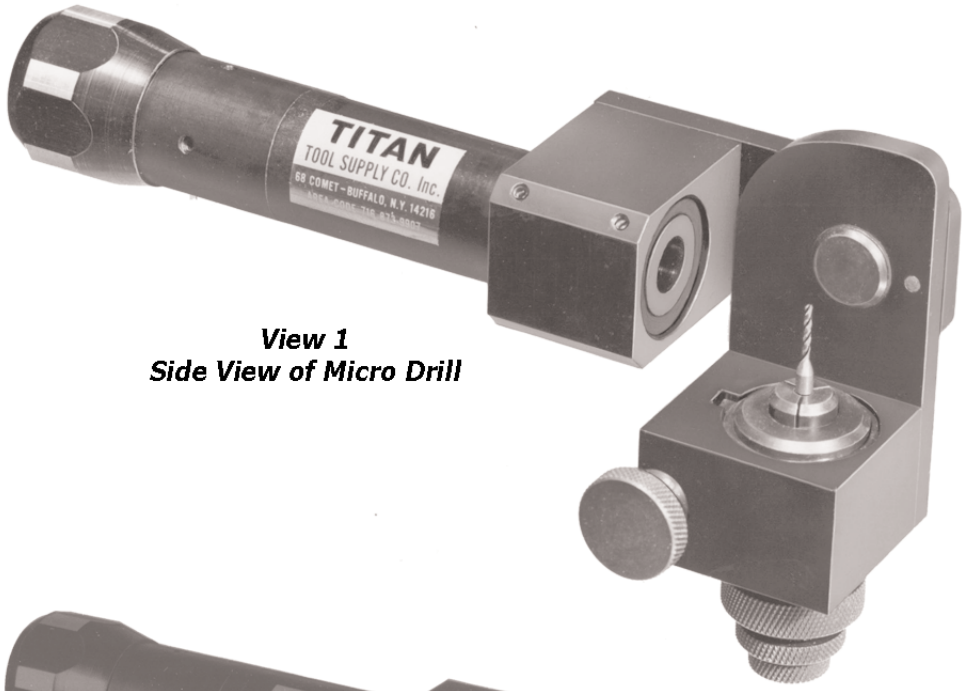
Micro Drill Geometry Analyzer

In todays Micro Manufacturing and Microelectronics Industries has increased the requirement for better geometry, finish and accuracy for miniature carbide drills. The principal methods of checking geometry, finish and accuracy is through the use of Optical Comparators and Toolmakers Microscopes. Both instruments are multipurpose tools, which are useful but time consuming setups not really suited for a miniature single purpose tool such as the carbide Micro Drill Geometry Analyzer.

This brought about the design of the MDGA for the specific function of checking of these miniature carbide drills. We have designed into the instrument all the functions necessary to completely inspect all the geometry and grinding finishes of the drill, whether it is new, or re-sharpened once, or numerous times.

The 30X Magnification of the Microscope with the Special Reticle, and 2 Position Viewing of the Drill, as well as the ability to rotate the drill 360 Degrees in a precision collets holder, allows all necessary checks to complete inspection. The Micro Drill Analyzing Microscope was so designed that two different views, in two different planes of the drill to be inspected, are possible without changing the setup.

The drill is fastened into a precision 1/8" collets holding device that allows for 360 Degrees rotation of the drill via a knurled rotating knob located beyond the collets opening plunger. A limited travel rack and pinion adjustment brings the drill into focus.

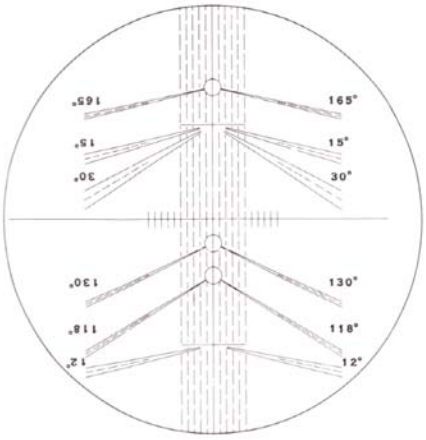


View 1
Side View of Micro Drill

View 2
End Pont of Micro Drill

View One: is the side of the drill, all your angles such as point, Primary and Secondary angles back taper etc. can be viewed as well as most other adjustments.

View Two: is the end view of the drill, it is inspected for Hook, Chisel Edge Width, and Centering to Angle Web Thickness, Primary Flare, land width Angle and etc. Two different views are obtained by rotating the drill holding fixture 90 Degrees on its own axis.



MDGA Reticle

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Micro Drill Geometry Analyzer

Data:
Weight: 1 lb. 6 ounces
Size: 9.50" X 1.50" X 2"
Magnification: 30X
Capacity: 0.125" Diameter Drills. (For Smaller shank drills, a spacer will have to be made. These are not Provided.)

This allows complete viewing without refocusing or any other adjustment. You should be able to check the following with the MDGA Microscope:

Point Centrality: Deviation of the Chisel Edge from the true axis of the Drill, It is tested as it is rotated about the center cross-hair line, viewing the end of the drill.

Hook: A positive rake condition in the flute face, excessive hook an result in premature drill wear and poor hole quality. A visual checking of the vertical and horizontal cross-hair line will determine if this condition is satisfactory, and comparing, one side of the drill to the other will allow you to make corrections if necessary.

Back Taper: Constant decrease in drill diameter should be .0004" to .0008", you can determine whether it is within tolerance by rotating the drill against the vertical and horizontal lines, without measuring it directly, uniformity can be ascertained.

Point Angle: It is most important that this be checked as to whether it is the allowable 118 Degrees or 130 Degrees both angles with their plus or minus 2 Degree Tolerances. This included angle between the two primary cutting edges is one of the most significant checks in drill geometry. If there is a difference of cutting edge height, it can easily be determined by rotating the drill in its holder and comparing against the relief and vertical lines.

Primary Relief Angle: Clearance angle at the outer corner of the cutting edge at the point. This angle is either 12 Degrees or 15 Degrees with a tolerance of plus or minus 2 Degrees which is easily proven by the reticle.

Secondary Relief Angle: This is the clearance angle behind the primary angle, normally 30 Degrees, plus or minus 3 Degrees, which is easily viewed against the master reticle chart.

Web Taper and Web Thickness: Which is the increase of the web thickness from the point to the back end of the flute length. This taper can be checked for uniformity of one edge to the other at any given point but not measured directly.

Chisel Edge Angle: Can be checked for uniformity and centering of one edge to the other, but not measured directly. Land Width and Land Width Angle: Can be checked for uniformity by the Horizontal Lines of the reticle.

Lip Height: The relationship of the primary cutting edges to each other. This is easily proven by the rotating the drill in its collet holder and comparing it, as it is rotated, one lip to the other, to the vertical control lines in the reticle.

Cutting Drill Edge Irregularities and Drill Irregularities: such as chips, pores and nicks can easily be seen and spotted.

Drill Point Finish: The Point Grinding Finish, and Primary Relief Finish can easily be determined under the 30X Magnification. Flute Finish: The flute finish can be judged visually under the 30X Magnification.

Body to Shank Concentricity: Can be determined by rotating the drill 360 Degrees in its collet holder in relation to the concentric lines running through the reticle. Many other visual and comparative tests can be easily accomplished with the MDGA.

The Micro Drill Geomotry Analyzing Microscope Comes equipped with two 4mm diameter Allen Head Screws for mounting the Microscope in a bracket holder if it is desired. This unit has to be built, by you, to suit your own requirements.

MDGA Ordering Information

Model Number	Drill Capicity Diameter	Price
MDGA	1/8”	$ 495.00

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