

MICROSIZE®

DIAMOND TOOLING TECHNOLOGY



Consider Bates Your Reliable Resource For Original and Replacement Tooling

Microsize® Plated Tooling from Bates Technologies helps you get the job done right the very first time. The tools go through the bore only once, removing the prescribed amount of stock to yield a perfectly-sized bore in one pass.

An expandable super-abrasive sleeve mounted on a tapered arbor, Bates' Microsize® Plated Tooling overcomes even the most difficult bore-sizing and finishing challenges. The tools excel on tandem bores and parts with keyways. The tools also yield extremely close tolerances and easily handle interrupted cuts.

Bates' Microsize® Plated Tooling is created for operation in bore finishing machines, Sunnen machines, drill presses and machining centers. The super-abrasive tools have been successful in bringing new efficiency to fine boring and grinding operations. They may also be used on their own to obtain fast stock removal, or as a part of a finishing process following traditional honing.

THE BATES *Microsize® Tooling Technology* PROVIDES ADVANTAGES TO YOUR CURRENT BORE SIZE PROCESSING

- More accurate and consistent bores
- Precise part size and part geometry
- Tighter tolerances
- Faster finishing requirements
- Coolant-induced availability
- Reduced cycle times
- Ease of Use
- Greater accuracy
- Manual or Automatic
- Increased production
- Lower overall tooling costs and reduced cost per part

ABOUT BATES TECHNOLOGIES

Bates Technologies, LLC, a division of Lapmaster International, serves customers worldwide in streamlining and perfecting honing operations. Bates and its legacy of Micromatic, a producer of superior honing tooling and equipment for more than 75 years, now serve international customers from manufacturing facilities worldwide. Broadly skilled in custom tooling and process application systems, our experienced engineers provide customers with the most efficient, cost effective and reliable tooling technology solutions.

Company product lines include:

- Metal Bonded Diamond and CBN Stones
- Single Pass Bore Finishing Tools
- Production Honing Mandrels/Tooling
- Diamond and CBN Plated Products
- Applications Engineering Lab
- Microhone® Products
- Microsize® Technology

Bates manufactures stones and/or tooling for all machines, including:

- Sunnen
- Barnes
- Nagel
- Engis
- Accu-Cut
- Toyo
- Micromatic
- Gehring
- Kadia
- Jones and Shipman
- Fuji
- Delapena

Sample of materials honed with Bates' metal bonded stones:

Diamond Stones	CBN Stones
• Cast Iron	• Hard/soft steel
• Carbide	• Inconel
• Chrome	• Stellite
• Ceramic	• Stainless steel
• Glass	• Zirconium

For other specialty materials, call with your application requirements.

Microsize Tooling

Our Recommendations for Success

The Microsize® Plated Tooling process allows manufacturers to achieve bore size and geometry with little operator involvement. Consider the following in planning your process and consult with a Bates technician.

Tool Operations

- **Installation:** Install tool in appropriate chuck or collet holder.
- **Presizing:** Superabrasive coated sleeve is pre-sized to slightly under the marked bore size on the sleeve. A slight adjustment is required to produce the bore size.
- **Break-In:** A break-in period is necessary for a short time at the application's start-up. This may require running the parts to low limit, leaving enough stock for cleanup until finish is achieved. Run parts again to achieve the required results.



Tool Speed

Approximate RPM range

(50-300 surface feet per minute)

TOOL DIAMETER	RPM RANGE
.250 Diameter	800-825 RPM
.500 Diameter	600-1800 RPM
1.00 Diameter	400-1200 RPM

During the break-in period, you should reduce the spindle speed of the tool if any chatter occurs. More frequent adjustments are required on new sleeves during this break-in period until the abrasive wears in.

Feed Rate

- Approximate rate (5-120 inches per minute)
- Superabrasive tools have a tendency to self-feed. Controlling the feed will provide more constant results and increase tool life.
- Do not force the tool through the part.
(Excess heat will develop and premature failure will occur.)

Coolant

- Conventional oil is generally preferred. A consistent flow must be maintained over the superabrasive portion of the tool. Honing oil provides maximum lubricity.

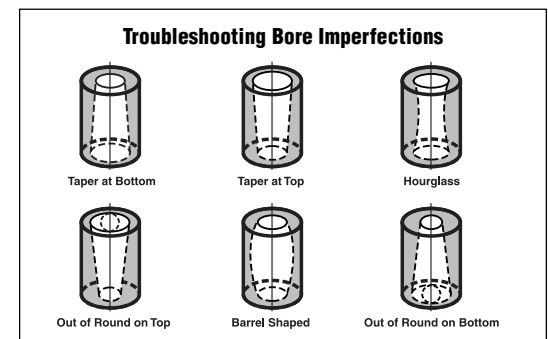
Consult Our Bates Technicians . . .

Preparation Checklist

- Part Size
- Part Material Type and Hardness
- Required Bore Tolerances
- Necessary Geometry
- Required Surface Finish
- Stock to be Removed
- Bore Interruption Restrictions
- Part Presentation
- Length of Part Run

Troubleshooting

Single-Pass Bore Imperfections



Technicians from Bates are available to assist in improving your tooling processes. Technicians in particular can offer probable causes of, and more importantly, potential corrections from numerous common bore imperfections. The above graphic indicates a number of common bore imperfections. contact Bates for literature on "Common Bore Imperfections: Causes and Corrections."



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