Minnesota Grinding, Inc.

5400 Douglas Drive N.
Crystal, MN 55429
( just 10 minutes from Minneapolis )

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(763) 535-4578 Fax
(888) 332-8452

www.minnesotagrinding.com
Send requests to: contact@minnesotagrinding.com

Drive-in Truck Dock with Overhead Crane
CENTERLESS GRINDING

Centerless grinding is an OD (Outside diameter) grinding process. It differs from other cylindrical processes in that the work-piece is not mechanically constrained. Centerless grinding is used to achieve roundness, surface finish and dimensional tolerances that are among the best available in metalworking.

We operate Cincinnati grinders ranging in size from #0's to #3's. Our size capacity is dependent on the weight of the part or bar, with additional consideration given to the diametric tolerance, surface finish, and roundness requirements.

A typical tolerance for centerless grinding would be +/- .0005” with a surface finish of 63 RMS or better. Tolerances of +/- .0001” and 16 RMS are achievable.

Please contact us for individual capacities and quotations.

<table>
<thead>
<tr>
<th>Min diameter</th>
<th>Max diameter</th>
<th>Max grind length</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.050&quot;</td>
<td>6.000&quot;</td>
<td>11.75&quot;</td>
</tr>
</tbody>
</table>

BAR STOCK can be ground in lengths up to 24ft. Large diameter bars can be run at shorter lengths depending on overall bar weight. Contact us for a quote.
BAR STRAIGHTENING

- Diameters from 0.125" to 1.250"
- Piece parts from approx. 10 in. length to 12 ft. round bar stock.

Please contact us for individual round bar straightening capacities and quotations.

BAR GRINDING

- Solid bar diameters from .048” to 6.0” and up to 24 ft. lengths
- Tubing up to 10” diameter and up to 24 ft. lengths

Grinding of 10” dia. tubing up to 24 ft. in length or 6.0” dia. solid bars up to 12 ft. in length!
CYLINDRICAL GRINDING

Cylindrical grinding (also called center-type grinding) is used to remove material from the cylindrical surfaces and shoulders of the workpiece. The workpiece is mounted and rotated by a workpiece holder, also known as a grinding dog or center drive. Cylindrical grinding machines may also include a swivel to allow for the forming of tapered surfaces. The five types of cylindrical grinding are: outside diameter (OD) grinding, inside diameter (ID) grinding, plunge grinding, creep feed grinding, and centerless grinding.

Tolerances for cylindrical grinding are held within two ten-thousandths of an inch (+/- 0.0001) (metric: +/- 2.5 um) for diameter and one ten-thousandth of an inch (+/- 0.00005) (metric: 1.27 um) for roundness.

We operate both manual and CNC cylindrical grinders for ID and OD work.

We will run jobs from single part or prototypes to quantities in the thousands. From very small parts to very large shafts.

MANUAL CYLINDRICAL GRINDING

<table>
<thead>
<tr>
<th>O.D. on centers</th>
<th>22&quot; max. O.D. x 105&quot; long</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.D.</td>
<td>16&quot; max. I.D.</td>
</tr>
</tbody>
</table>

CNC CYLINDRICAL GRINDER

<table>
<thead>
<tr>
<th>Distance between centers</th>
<th>64.0 inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max grinding diameter</td>
<td>14.9 inches</td>
</tr>
</tbody>
</table>
THREADS

Shrinkage & Overburn have you Stumped?

www.minnesotagrinding.com
TOLL FREE 1.888.332.8452

- Blanchard
- Double Disc
- Surface
- CNC Thread Grinding
- CNC Cylindrical Grinding
- Centerless Grinding
- Bar Straightening
- Lapping
- Honing
- Thread Rolling
THREADED GRINDING
CNC External & Internal Thread Grinding

O.D.  Maximum thread size of 22" dia.
Maximum thread length of 24"
(max. part dia. of 22”, max. part length of 40”)

I.D.  Minimum thread size of 5/8” (.625) minor dia.
Maximum thread size of 10"
(max. part dia. of 20”, max. part length of 9”)

- Any thread form
- Any lead
- Multiple start threads
- "J" threads
- Variable pitch threads
- Taper threads
- British threads
- Acme threads
- Buttress Threads
- Trapezoidal
- Metric

WE CAN ALSO PRODUCE ROLLED THREADS UP TO 3” DIAMETER FOR SHORT THREADS AND UP TO 20 FT LONG ON SMALL DIAMETER BARS.

APPLICATIONS
- Core pins
- Electrodes
- Cavities
- Bone taps
- Roller screws
- Worms
- Ball screws
BLANCHARD GRINDING

Part sizes up to 36" corner to corner
Part thickness or height up to 14.375"

Typically used for surface grinding of large and small plates, washers and rings, etc. The main feature of Blanchard grinding is heavy stock removal rates for all magnetic materials. Non-ferrous parts are handled at slightly lower production rates due to the holding requirements. The Blanchard will leave its trademark cross-hatched surface finish pattern, typically within a 32-125 RMS range, though better finishes are possible.

Blanchard grinding, technically referred to as rotary surface grinding, quickly removes stock from one side of a part, typically a part too large to be double disc ground. Parts as large as 25" x 25" or 20" x 30" can be Blanchard ground on our machines. Dimensional tolerances to ±.001", parallelism to .001", and flatness to .001" are achievable. Using significantly greater horsepower than other grinding methods, Blanchard grinding removes large amounts of stock quickly and efficiently.

SURFACE GRINDING

Part sizes up to 10" x 30" x 12" high

DOUBLE DISC GRINDING

Up to 9.0" max OD on through-feed grinding
Up to 8.675" square for in-feed grinding
Part thickness range: .032 - 3.500"

Double disc grinding is the removal of material from a part with parallel surfaces. The metal removal takes place on both sides of the part simultaneously, with the grinding occurring on the faces of the grinding wheels producing flat and parallel sides.
LAPPING

Part sizes up to 36" O.D. x 18" high

Lapping removes material very slowly and is typically used in smoothing, finishing, or achieving an extremely close tolerance on a metal surface. A lapping compound is rubbed against the work-piece in rotary and reciprocating motion. Lapped surfaces will be very smooth, but not shiny.

HONING

Honing is a final finishing operation conducted on a surface, typically of an inside diameter. Abrasive stones are used to remove minute amounts of material in order to tighten the tolerance on cylindricity. Honing is a surface finish operation, with minimal stock removal. A slight, uniform pressure is applied to a light abrasive that wipes over the entire surface.

Please contact us for individual quotations and capacities of internal honing.
JIG GRINDING

Specialized Precision Grinding

Jig Grinding uses very precise machines for locating and generating very accurate holes, contours, and surfaces to tolerances of +/- .0001" or less. Jig grinders are similar to jig borers, but they use high-speed spindles and grinding wheels instead of boring tools.
TURNING

Although precision grinding is our specialty, we operate several turning/milling/drilling centers for our customers that prefer to have their products supplied complete.

CNC LATHES:

SLANT JR.
Distance between centers
Max Swing
Max turn diameter
Max turn length
Hole through draw tube
16 C Collet system to
Machine has bar feeder to

MORI SEIKI SL-25A/500
Distance between centers
Max Swing
Max turn diameter
Max turn length
Hole through draw tube
16 C Collet system to
CNC SWISS AUTOMATIC WITH BAR FEED:
Our CNC Swiss machines permit complex parts to be completely machined in one setup. It also permits many operations to be performed simultaneously instead of sequentially, substantially reducing the total time required to machine the part. Speeds and feeds can be varied to achieve the surface finish that the job requires.

Citizen L-16 Type V (1)  16mm (5/8") bar capacity with back working spindle.
Citizen B-12 Type VI (3)  16mm (5/8") bar capacity with back-working spindle, cross drilling, milling, or slotting.

Example parts
## CNC MILLS AND TAPPING CENTERS:

### CHEVALIER FALCON, 2040MV, 3-AXIS

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table top dimensions</td>
<td>54&quot; x 13&quot;</td>
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<tr>
<td>Max load on table</td>
<td>1870 lbs.</td>
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<tr>
<td>Distance from table to spindle nose</td>
<td>4.0 – 26.8 inches</td>
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<tr>
<td>Max travel X axis</td>
<td>40.0 inches</td>
</tr>
<tr>
<td>Max travel Y axis</td>
<td>20.0 inches</td>
</tr>
<tr>
<td>Max travel Z axis</td>
<td>24.0 inches</td>
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<tr>
<td>Horsepower</td>
<td>10</td>
</tr>
<tr>
<td>Spindle speed</td>
<td>60 – 6000</td>
</tr>
<tr>
<td>Tool capacity</td>
<td>16</td>
</tr>
</tbody>
</table>

### BROTHERS TC-221

<table>
<thead>
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<th>Specification</th>
<th>Details</th>
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</thead>
<tbody>
<tr>
<td>Table top dimensions</td>
<td>23.62&quot; x 11.81&quot;</td>
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<tr>
<td>Max load on table</td>
<td>264 lbs.</td>
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<tr>
<td>Distance from table to spindle nose</td>
<td>17.71 inches</td>
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<tr>
<td>Max travel X axis</td>
<td>16.535 inches</td>
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<tr>
<td>Max travel Y axis</td>
<td>11.811 inches</td>
</tr>
<tr>
<td>Max travel Z axis</td>
<td>9.851 inches</td>
</tr>
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