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## Advanced Manufacturing Processes

We use advanced manufacturing processes to produce the highest quality precision machined components. Small parts are our focus. Our core product families include parts that are typically less than 8.00 inch diameter or cube, and our sweet spot is 3.00 inches and smaller. Part volumes range from small lot sizes (less than 10 pieces) up to moderate volumes (100,000 pieces). Round bar stock is our most common material shape but we also work with shaped bar, tubing, extrusions, plate, and small castings.

### **Core Processes**

- Swiss screw machining
- Turning
- Milling
- Thread Rolling
- Centerless Grinding (in-feed and thru-feed)
- Cylindrical Grinding
- Honing
- Assembly

We operate some of the most advanced CNC machining equipment available and invest in the best tooling and gaging. Our equipment is modern and multi-axis with super-precision capabilities. We routinely turn parts within tolerances of .0002 inch and grind parts within .00005 inch. In addition to thread rolling our own products, we perform the process as a service on customer supplied parts. Our primary processes are supported by a wide range of secondary processes.

### **Secondary Processes**

- Deburring and Tumbling
- Parts Cleaning
- Drilling and Tapping
- Broaching
- Surface Grinding
- Part Marking

### **Part Marking**

In addition to marking our own products, we perform part marking as a service on customer supplied parts. Our in-house part marking capabilities support aerospace requirements.

- Dot-Peen Marking
- Vibro-Peen Marking
- Electrolytic Etch Marking
- Ink Marking
- Roll Marking
- Stamping

### **Assembly**

We offer mechanical assembly services for products with fewer than ten detail parts.

- Mechanical assembly
- Bonding
- Helical thread insert installation
- Swaging

### **Full Service Logistics**

We manage a diverse and dedicated supply chain. Our region has one of the largest concentrations of precision manufacturing companies in the world. We manage the end to end supply chain for customer products that require special processes. Our major outsourced processes fall in four major categories: 1) heat treatment, 2) coatings, 3) testing, and 4) grinding, forming, and nonconventional machining.

### **Heat Treatment**

- Aging
- Austenizing
- Austempering
- Brazing
- Carburizing
- Carbonitriding
- Core Hardening
- Freezing
- Induction Hardening
- Ion Nitriding
- Malcomizing
- Nitriding
- Normalizing
- Oil Quenching
- Precipitation Hardening
- Solution Heat Treating
- Stabilizing
- Stress Relieving
- Tempering
- Vacuum Annealing
- Vacuum Hardening

### **Coatings and Surface Finishes**

- Anodizing (Clear, Black, Colored, Hardcoat)
- Black Oxide
- Cadmium Plating
- Conversion Coating (Alodine, Chemfilm, Iridite)
- Chrome Plating
- Chromium Carbide
- Copper Plating
- Dry Film Lubrication
- Electro-Polishing
- Flame Spray
- Gold Plating
- HVOF
- Nickel Cadmium Plating
- IVD Coating
- Magnesium Coating
- Painting & Priming
- Passivation
- Phosphate Coating
- Plasma Spray
- Silver Plating
- Tin Plating
- Titanium Nitriding
- Tribaloy
- Zinc Plating

### **Testing (Non-Destructive and Metallurgical)**

- Fluorescent Penetrant Inspection (FPI)
- Magnetic Particle Inspection (MPI)
- Mechanical Testing (Tensile, Stress Rupture, etc.)
- Metallography
- Pressure Testing (Air & Fluid)
- Salt Spray Testing
- Temper Etch Testing/Grind Burn Inspection
- Ultrasonic Testing
- X-Ray

### **Grinding, Forming, and Nonconventional Machining**

- Creep Feed Grinding
- Double Disc Grinding
- Gear Grinding
- EDM
- Heading (Hot & Cold)ID/OD Grinding
- Lapping
- Laser Cutting
- Soldering
- Shot Peening
- Splining
- Stamping
- Thread Grinding
- Waterjet Cutting
- Welding

**If your parts require a process that isn't listed, please contact us. This list has grown over decades of adapting our capabilities to customer needs.**