Metal Craft has been providing quality precision machining for medical device manufacturing since 1978.

With every partnership, we bring years of expertise to complete projects on time and within budget. From design to delivery, we craft simple solutions for complex problems with industry-leading technology. Our two world-class production floors provide you with new resources to achieve better results. They also allow us to serve your project needs quickly and responsively with a unique risk management plan. With additional capacity, we’re able to maintain production no matter what happens.

**Metal Craft**

- ISO 9001
- ISO 13485
- AS9100
- Multi Axis CNC Turning
- 3, 4, and 5-Axis Milling
- 7-Axis Grinding
- Swiss-type Machining
- Gun Drilling and Honing
- Wire EDM and Hole Popping
- Heat-treating
- Glass Bead Blasting and Finishing
- Laser Etching
- Citric and Nitric Passivation
- Complete Inspection
- Ultrasonic Cleaning
- Welding/Laser/Tig

**Riverside Machine & Engineering**

Riverside Machine & Engineering specializes in Aluminum Vacuum Furnace Brazing for all applications, including heat sinks and cold plates.

- ISO 9001
- ISO 13485
- AS9100
- Annealing and Heat-treating of Aluminum
- Full production of heat sinks, cold plates and custom brazing projects
- Vacuum Brazing prototype services
- Compliant specifications include: AWSC 3.7, MIL-B-7883, and AMS 2770
- Vacuum Heat-treating of PH Stainless Steel
- 3, 4, and 5-axis CNC Milling
- CNC Turning
- Swiss-type Machining
- Honing
- Glass Bead Blasting and Finishing
- Laser Etching
- Nitric Acid Passivation
- Inspection services, including CMM and vision systems
Metal Craft & Riverside

Whatever application you need, we apply our industry experience to finish every project on time and within budget. We go above and beyond the rigorous requirements of ISO certifications and equipment validations to ensure you receive the highest level of precision and quality. From the high performance demands of military and defense manufacturing to the precision needs of the medical and electronics industries, our knowledgeable and experienced staff will deliver every time.

Industries and Clients Served
Metal Craft and Riverside have proven excellence in many industries with a diverse customer base.

- **Military/Defense and Aerospace**
  Raytheon, Lockheed Martin, Ducommun, Northrop Grumman
- **Electronics**
  Datacard, Accu-Tech, Tosoh, Mocon, Analogic
- **Medical**
  Top medical device OEMs and new device manufacturers
Milling/Wire EDM

Computerized numerical control (CNC) milling and wire electric discharge machining (EDM) are just two of the many foundations of our operation. Our investments in the latest technology allow us to increase efficiencies, meet deadlines, and improve your bottom line. With a variety of CNC machining centers, we’re able to efficiently route your projects to ensure on-time delivery.

Wire EDM
We use wire EDM to accurately produce delicate parts or to machine extremely hard materials. Our wire EDM process uses a charged wire to cut through conductive materials with the heat produced by electrical sparks. Deionized water flushes away particles leaving a burr-free finish. Our CNC 5-Axis wire EDM equipment lets us machine all five sides in one set-up, allowing for quick, accurate delivery and a very repeatable process. Wire EDM is excellent for making high tolerance pieces and complex shapes.
With over 30 years of experience in the medical device and implant industry, we have established a reputation for precision work from start to finish.

Our capabilities range from very fine precision instruments and complex assemblies to larger tools, replacement joints, and implants. We cover every aspect of the production process in-house, so we can track quality through the entire project, ensuring the highest level of precision and quality assurance.

Our commitment to accuracy goes beyond our rigorous ISO certifications and equipment validations. We’re uniquely qualified for medical device and implant manufacturing:

- ISO 13485 Registered
- FDA Registered
- Fully compliant with FDA and CGMP regulations
- AS9100
Complex Assembly

While many machine shops look to outside vendors for complex assembly, we have the means in-house to see your project through to completion.

After we manufacture your complex parts, our engineers, assembly technicians, and inspectors work together to ensure functionality and usability. We carefully manage every step through final assembly and testing.

- Multi-level assembly capabilities
- Improved quality control
- Years of assembly experience
- Partnering to go beyond fulfilling requirements, to improve form, fit and function
Quality Management Systems
Quality isn’t just something we talk about. We do something about it. We understand the significance of quality in every project. To ensure you’re getting the best manufacturing, we’ve developed rigorous self-imposed requirements and processes. Your product is carefully monitored throughout the manufacturing process using our custom Quality Characteristic Control (QCC) system to ensure quality during production.

Complete In-house Inspection
With years of experience performing inspections, our in-house inspection department is a critical part of the production team. Your parts won’t leave our building unless they are built to your specifications and meet our own high level of quality requirements.

Quality Systems
• ISO 9001
• ISO 13485
• AS9100
• 6S Program
• Lean Manufacturing
• CGMP Compliant
Project Management & Prototyping Services

Complete In-House Project Management and Fulfillment
Managing your project starts with your knowledgeable Account Manager who guides your entire project from quote to delivery. All of our account managers have industry experience and bring their hands-on background to work for you. We believe our partnership with you is the best form of project management. We’ll work closely with you until the job is finished and provide you with immediate access to the status of your project.

Prototyping Services
When you need quick turn-around on precision prototypes, our Prototype Action Response Team (PART) is ready to help. This team of engineers looks at your drawings and specifications, listens to your goals and ideas, and manufactures a prototype that’s perfect for you. Upon request, PART will work with your engineering staff to improve cost effectiveness, suggest innovative ideas, and provide quality prototype services to improve manufacturability of your product.
When your projects require specialized welding, we have the techniques and technology to make precise and clean welds for your application. Our engineers consider materials, weight, longevity, and cosmetics to recommend the best type of weld to meet your objectives.

**GTAW (Tig) Welding**
Our welding equipment allows us to quickly create strong welds of the highest quality and durability. Depending on your project, we’ll use the type of welding that’s right for your application to join materials of different thickness. This process is validated and certified in accordance to AWS D17.1 and AWS B2.1.

**Laser Beam Welding**
Laser beam welding allows us to complete welds faster and more consistently than other types of welding. With the concentrated laser source, we’re able to make narrow and deep welds as small as 0.2 mm. The flexibility of laser beam welding allows us to join multiple materials of differing thickness. This process is validated and certified in accordance to AWS C7.4 and AWS B2.1.
From fine finishes to precise dimensions, we use grinding to perfect your product. Our computerized numerical control (CNC) 7-axis grinding machines can custom form rasps, drills, taps, and reamers out of almost any material to your exact specifications.

We have perfected custom profile grinding of complex shapes including knee implants, trials and forms, and specialized implants. Whatever your application—from manufacturing medical devices to precision ground hex drivers—we’ll use the right technique to ensure a clean, precise, and perfect finish.
Our precise Swiss-style equipment is fine-tuned for deep hole drilling, gun drilling, and honing. With our multi-axial turning lathes, we can turn, mill, thread whirl, and gun drill to reduce secondary operations. We’re able to create heavier cuts and produce longer parts than on a standard CNC turning lathe.

Gun Drilling and Honing
We provide gun drilling, deep hole drilling, and honing in multiple sizes from .042” to 1\(\frac{1}{8}\)” diameter, up to 36” in length, and straight within .001”. We also do multiple shapes (circles, squares, rectangles, and other configurations) in a variety of metals. This is a reliable method of drilling short and deep holes with excellent burr- and chip-free finishes.
Finishing Services

From deburring and glass bead blasting to laser etching, cleaning and passivation, we’ll add the finishing touches on your projects for the highest level of precision and quality. Our engineers and project managers will make sure your project meets your exact specifications when it leaves our production floor.

**Vacuum Heat-Treating**
Our ultra-clean vacuum heat-treating process allows stainless steel medical instruments to be precipitation-hardened without creating an oxide layer.

**Blasting**
Glass bead and sand blasting services are offered to complete the visual uniformity of your projects.

**Laser Etching, Ultrasonic Cleaning, and Passivation**
We will etch your final product with your supplied logos, tracking data, lot ID, part numbers, or measurement information. We offer full-service diode laser marking to include:
- Rotary axis marking
- Deep etch marking
- Custom graphics and logos

We also provide full-service cleaning, ultrasonic cleaning, and full nitric and citric passivation of all stainless metals.
Aluminum Vacuum Furnace Brazing & Heat-treating

Our flux-less aluminum vacuum furnace brazing process is non-corrosive, cleaner, and more reliable than other joining methods. In fact, it’s so durable that it creates a leak-tight bond down to 10-7 STD cc/sec of helium.

The vacuum brazing process creates a very strict control of contaminants, making it ideal for oxidation-sensitive alloys (such as those used in the aerospace and military/defense industries). Whatever your industry or application, our engineering staff will work as an extension of your team to deliver your desired results with our vacuum brazing prototype to production services.

We also provide solution heat-treating and quenching of 6061 aluminum for the production of cold plates, heat sinks, and custom brazing projects. Every piece we manufacture complies with stringent industry specifications defined within the following: AWSC 3.7, MIL-B-7883, and AMS 2770.
Equipment List

CNC Machining Centers
- (6) Haas Super VF-3SS with 5th Axis
- (2) Haas VF-4SS with 5th Axis
- (2) Haas Super VF-3
- (3) Mazak 410A with 4th Axis
- (3) Mazak 510C with 4th Axis
- Mori Seiki Dura Center 5 with 5th Axis
- Mori Seiki Dura Vertical with 5th Axis
- Mori Seiki MV-40
- Mori Seiki MV-40B
- Mori Seiki SV-500
- Mori Seiki UHX 4000

CNC Turning Centers
- (2) Mori Seiki-SL-150MC
- Mori Seiki-SL154S
- (3) Mori Seiki-SL-150 CNC
- Mori Seiki-SL-15
- (2) Daewoo Puma 200A
- Miyano JNC-35
- Hardinge Chuckers
- Nardini Precision Engine Lathe

Multi Tasking Center
- (2) Integrex i-150 Mill Turns

Swiss
- Star SB-16C
- (3) Star SB-16D
- Tsugami BS20-Ill Super
- (2) Tsugami SS-20
- Maier ML-26D Proline

7 Axis CNC Grinding Machines
- ANCA—TX7+ with autoloader
- ANCA—TX7+
- ANCA—TG7

Gun Drill
- El Dorado M30-15 Twin C
  (hole sizes .047” up to 3/8” and 15” in length)
- Dehoff DH-1036T Twin Spindle
  (hole sizes up to 1/16” and 36” in length)
- Dehoff DH-1036 Single Spindle
  (hole sizes up to 1/8” and 36” in length)
- (3) Sunnen Hone (Auto and Manual)

Wire EDM
- (3) Fanuc Robocut c400iA
- Fanuc Robot M710ic/50
  (Robot can tend four EDM’s)
- Hole Master HM400
- Charmilles 310
- Charmilles 240 SL

Manual Milling
- (2) Haas TM1
- (4) Bridgeport Series I

Heat Treating
- (2) Cress Heat Treat Oven

Cleaning & Passivation
- Citric Passivation
- (2) Ultrasonic Cleaning

Laser Marking
- Laservall Violino Series DPSS
- LASF–30 W Pulsed Laser Etch

Material Handling/Saw Department
- GROB Band Saw (manual)
- Amanda HA250W Autosaw
- Amanda 250 Autosaw
- Doall Band Saw (manual)
- (2) ACM Abrasive Cut-off Saw

Finishing Department
- Empire 6060 Rotary Batch Blaster
- Empire Tumble Blaster
- Empire PF-2636 Suction Blaster
- (2) Mini Blasters
- SCI Electromechanical deburring machine
- Tumbler Gemini 4 FCT
- Hammond Roto Finish Tumbler
  Gemini 4-FB
- (3) Glass Bead Blasters
- Grit Blaster
- Royson Centrifugal Disc Finisher
- HZ-40 Centrifugal Barrel Finisher

Welding
- Miller Dynasty 350 Tig Runner
- OR Laser Welder fully programmable
  Multi-axis

Inspection CMM’s
- Pratt & Whitney SuperMicrometer
- Zeiss Vista CMM
- Zeiss Contura G2, Scanning CMM
- (2) Zeiss Duramax, Scanning CMM
- Zeiss Eclipse CMM w/USOFT Software
- Numerex 3660-18 - USOFT Software

Vision Systems
- RAM Optical–Data Star
- RAM Optical–Sprint
  (with touch probe)

Optical Comparator
- Nikon V-12 Comparator
- (7) Deltronic DH216
  (MPC-5 read out)
- Gage Master
  (Mitutoyo Geocheck read out)
- (2) Wilson Hardness Tester
- 30” Deltronic (MPC-5 read out)

Software
- Unigraphics NX
- SolidWorks
- CAMWorks
- ProCAD/ProCAM II

Note: Equipment list is subject to change.
Equipment List

Vacuum Brazing/Heat Treating
- PVT Braze Ovens (Approximate work zone 26” wide 31” wide 29” high)
- PVT Braze Ovens (Approximate work zone 80” wide 33” wide 22” high)
- (3) Wisconsin Oven Corporation electric ovens
- (2) Dispatch ovens PCB-2-16
- Frigidaire Commercial 19.7 cu. ft. Chest Freezer Model FCCS201FW

CNC Machining Centers
**Verticals**
- Matsuura RAI with pallet changer
- Haas VF-2 with 4th Axis
- Haas VF-3SS with 4th Axis (360 degree rotation)
- (2) Haas VF-3SS with 5th Axis
- (2) Haas VF-4 with 4th Axis
- Haas VF-5SS with 4th Axis
- (2) Haas VF-6SS
- Mori Seiki MV55
- Brother VTC
- (2) Fadal 8030
- Okuma 6VA
- (3) Mazak Nexus 510C with 5th axis

**Horizontals**
- (2) Mazak Nexus 5000 II
- Mori Seiki SH 50
- (2) Mori Seiki NHX 5000

CNC Turning Centers
- Kia KT 15
- Super Kia SKT 15
- Super Kia SKT 21
- Star SB16 Swiss Type
- Star SR32 Swiss Type

Finishing Department
- Large and Small Vibratory Tumblers
- (2) ABB Raymond Blast Systems 36” x 36” x 36” work zone
- (2) TD TJL Blast Systems 22” x 18” x 12” work zone

Finishing Department continued
- Mini Blaster
- Tumbler Gemini 4 CFT
- Blaster Empire Pressure Ergo 36” x 48”
- Hammond Roto Finish Tumbler Gemini 4-FB

Laser Marking

Inspection
- Mitutoyo surftest SV-400
- (3) Closed loop liquid pressure drop flow tester (.04 gallons per minute up to 8 gallons per minute)
- RAM Optical—Data Star
- RAM Optical—Sprint 250 Data Star
- (2) Mitutoyo PH3500 Optical Comparitors
- Numerex CMM
- Alcatel Helium leak tester ASM 142
- ZEISS Contura G2 Scanning CMM

Software
- Gibbs CAM
- CAM Works
- SolidWorks

Manual Mills
- Bridgeport Series I
- Sajo Horizontal

Welding
- Miller Syncrowave 250

Sawing
- GROB Band Saw (vertical)
- Ellis Mitre Band Saw 4” capacity
- (2) HEM horizontal 12” capacity
- HE&M Autosaw H110a
- HE&M Autosaw H90a

Note: Equipment list is subject to change.