



## CAPABILITIES AND PROJECTS

### FORGING

Relevant divisions: Orchid Stealth

#### Capabilities

- **Forging implantable exotic alloys** such as titanium, cobalt-chromium, molybdenum, stainless steel and zirconium
- **Multi-axis turning and milling** for implant finishing
- **In house** non-destructive testing, and tool creation
- **Forging design** from finished part model
- **Innovative engineering:** including concept, design, and prototyping solutions for efficient and cost effective production
- **Net and near-net forging:** producing products that are higher in quality, more structurally sound, and lower in cost
- **Complete machining capabilities:** for hard-die manufacturing and machining of implants
- **Lean manufacturing:** including value stream mapping and Kaizen events to ensure processes are optimized and all waste is removed
- **Project management:** with experienced engineers managing your project from start to finish

#### Projects

- Acetabular cups
- Femoral hip stems
- Femoral knee components
- Tibial base components
- Various trauma and fusion plates
- Extremity parts (ankles, elbows and shoulders)
- Forged blanks for further machining (an extremely cost effective way of producing low volume parts)

### MACHINING

Relevant divisions: Orchid Unique, Orchid MPS, Orchid Anzon and Orchid Keller

#### Capabilities

- **The latest in machining technology:** including turning, milling, grinding, and EDM machines, as well as automated measuring systems
- **Special processes:** like color coding, laser welding, cutting and etching, diamond coating, gundrilling and micro deburring
- **Vertical integration:** parts can be manufactured, laser marked, cleaned, passivated, packaged and sterilized in one location
- **Engineering support:** including material selection, prototypes, performance enhancement and design for manufacturing
- **Inventory stocking programs:** reducing inventory investment and improving customer service levels
- **Packaging and labeling:** both sterile and non-sterile
- **Project management:** by engineers with years of project management experience
- **Multi-axis** milling, conventional turning, swiss style turning and grinding
- **In-house** fixturing and tooling

#### Projects

- Surgical instruments



- Surgical drill bits, reamers, cutting burs and blades
- Surgical cutting burs
- Surgical instruments
- Orthopedic implants
- Fracture fixation plates, rods, screws and cages
- Spinal screw, hook and rod systems
- Intramedullary nails
- External fixation assemblies
- Bone screws, plates and anchors
- Joint replacements of the wrist, elbow, ankle and toe

## COATING

Relevant Divisions: Orchid Bio-Vac, Orchid Bio-Coat, Orchid Stealth Coating

### Capabilities

- **Full spectrum** of orthopedic, spinal and dental implant coatings and surface treatments
- Custom coating technologies
- **Proprietary Hydroxylapatite (HA) coating** on titanium, cobalt-chromium or stainless steel: Orchid is a leader in this technology, with over a million implants coated
- **Titanium plasma spray (TPS) orthopedic coating** on Titanium or CoCr substrates: with a purity that enables the coating to exceed the ASTM requirement, thereby eliminating cracking
- **Resorbably blast media (RBM) surface treatment** on Titanium substrates: creating a roughened surface comparable to a 100 mesh A1203 finish without leaving any embedded debris
- **Composite coatings:** including HA on plasma, beads, chemtex and irregular sintered coatings, as well as TPS on RBM-prepared substrates
- **Porous coatings:** such as spherical bead and irregular particle coatings, available in a range of powder sizes, types and coating processes to meet tight tolerances or unusual specifications
- **Passivation per ASTM F86:** meeting the highest standards of cleanliness
- **Custom coating technologies:** based on our unparalleled experience in the heat-treating process
- **Quality control:** including visual, dimensional and mechanical testing as well as NDT capability

### Projects

- Joint implants
- Dental implants
- Spinal implants

## PLASTICS

Relevant Divisions: Orchid MACDEE

### Capabilities

- **Experience with a wide range of medical-grade plastics:** UHMWPE, PEEK, PMMA, high-temperature resistant engineering plastics, thermoplastic resins and biodegradable polymers
- **Multi-axis** CNC programming, milling and turning
- **In-house** injection mold tool design and creation
- **CNC plastics machining:** over 40 pieces of equipment ranging from five-axis milling to live-tool turning centers with sub-spindles
- **Access to a wide range of medical grade plastics:** including implant grade UHMWPE, high temperature resistant engineering plastics, thermoplastic resins and biodegradable polymers



- **Plastics injection molding:** multiple presses with 30-150 tons of clamping force for small, medium and high volume runs
- **Portable Class 10,000 controlled environment rooms:** offering a high degree of protection from particulate contamination
- **Product cleaning and assembly:** conducted within our permanent Class 10,000 controlled environment room
- **Product packaging:** including pouch or blister sealing
- **Boxing, labeling and shrink-wrapping:** additional services that produce a product ready for sterilization

## Projects

- Medical Devices
- Implants
- Trial components
- Delivery Systems
- Acetabular liners
- Tibia plateaus
- Glenoids

## DESIGN

Relevant Divisions: Orchid Design

## Capabilities

- **Comprehensive concept development:** an exploration of new, alternative design approaches
- **Thorough feasibility confirmation:** achieved through careful analysis, prototyping and testing
- **Innovative, in-depth design services:** resulting in cost effective and robust designs
- **Functional prototyping:** quickly created with our state-of-the-art fabrication equipment
- **Qualification testing:** including bench top, animal and cadaver evaluations
- **Design for manufacture:** facilitating rapid transition to full scale production
- **Small scale / pilot manufacturing:** for clinical trials, market evaluations, customs or validations
- **Quality and regulatory consulting services:** FDA submissions, quality systems training and management, supplier auditing
- **Medical device** regulatory and quality systems consulting

## Projects

- Complete implant and instrument systems
- Gage design and fabrication
- Design troubleshooting
- Minimally invasive instruments
- Customs and specials - design and manufacture
- Design for manufacturing / cost reductions
- Biologics delivery systems
- Auditing, training, regulatory submissions, international compliance, quality system development, U.S. agent services