PHARMACEUTICAL PACKAGING

- Metered-dose inhaler (MDI) coatings
  - Proprietary fluoropolymer-free coating
  - PTFE
  - FEP
- Tin tube manufacturing
- Injection molding, including multi-shot
- In-house tool shop
- Cleanroom assembly & packaging
- Pad & flexographic printing
- Custom labeling & packaging

EACH CENTER OF EXCELLENCE IS EQUIPPED WITH:

- In-house design & engineering services
- Design for manufacturing (DFM)
- Prototyping/preproduction
- Materials selection
- Part & mold design
- Part production
- Supply chain management
- Qualification
- Assembly
- Secondary operations
- Packaging solutions
- Sterilization management
- Regulatory support

MARKET FOCUS

- **ROBOTIC** SURGERY
- **ELECTROPHYSIOLOGY**
- **STRUCTURAL** HEART
- **ENDOSCOPY**
- **PERIPHERAL** VASCULAR
- **CARDIOVASCULAR**
- **NEUROVASCULAR**

12
World-Class Facilities

SALT LAKE CITY Utah	**BROOKLYN PARK** Minnesota	**ATHENS** Texas	**MONROE** Connecticut
CARTAGO Costa Rica	**SANTA CLARA** California	**FAIRFIELD** California	**WINSTON-SALEM** North Carolina
MEBANE North Carolina	**HARRISONBURG** Virginia	**ALAJUELA** Costa Rica	**HAINA** Dominican Republic

250+ Credentialed Engineers

3,300+ Employees

225K Sq. Ft. Cleanrooms

945K Sq. Ft. Facilities

ISO 13485:2016 | FDA registered

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BIOMERICS™

We Improve and Save Lives

ONE PARTNER.

AN END-TO-END ECOSYSTEM.

PRODUCT PLATFORMS THAT ARE POWERING THE FUTURE OF MEDICAL DEVICE MANUFACTURING.

ISO 13485:2016 | FDA registered

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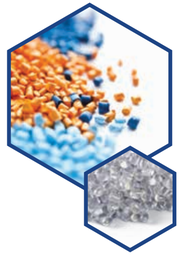
CENTERS OF EXCELLENCE

PERFORMANCE MATERIALS

- Custom medical-grade polymers
- Proprietary medical-grade polyurethanes
  - Quadraflex®
  - Quadrathane®
  - Quadraplast®
  - Quadrasil™
  - Quadraphilic™
  - Elast-Eon™
- Custom compounding & polymerization
- Pharma compounding
- Coating materials & technologies
- Full in-house analytical chemistry & metrology lab



PRECISION EXTRUSION

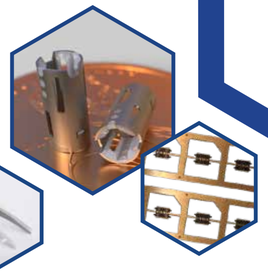
- Complex extrusion processes
- Solid, single- & multi-lumen extrusions
- Braided high-pressure tubes (Prolix™)
- Microextrusions (braiding)
- Layered coextrusions
- Coextrusion of up to 5 materials
- Jacketing
- Balloon catheter tubing
- Multilayer & multiple-pass extrusions (1st, 2nd & 3rd)
- Profile extrusions
- Solid core
- Coated wire
- Precision cut to length
- Simple & complex tubing set solutions
- Steerable guidance
- Tapered extrusions

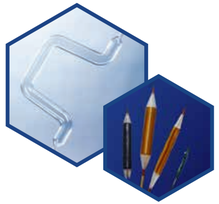
MEDICAL PLASTICS

- Robust molding capabilities
  - Prototype molding
  - Mold construction
  - Single- & multi-cavity molds
  - High- & low-volume molding
- Additive manufacturing (3D printing)
- Advanced thermoforming
  - Large part & enclosure molds
- Injection molding
  - Vertical & horizontal molding
  - Insert & overmolding
  - Rotary insert molding
  - Micromolding
  - 2-shot injection molding
- Liquid resin casting

MICRO-OVERMOLDING

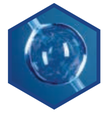
- Rotary insert molding (60-175 tons)
- Conventional molding (40-120 tons)
- Micromolding & micro insert molding
- Liquid silicone rubber (LSR) molding
- Reel-to-reel insert molding (40 tons)
- End-of-arm tooling on all presses
- Proprietary precision feed system on all RJG reel-to-reel injection molding machines
- Robotic mold tooling





BALLOONS & BALLOON CATHETERS

- High-pressure balloons
- Compliant, semicompliant & noncompliant balloons
- Advanced multi-layer composite balloons
- Optimized introducer compatibility
- 0.014", 0.018", 0.021", 0.035" & 0.038" guidewire compatibility
- Tip optimized for radiopacity or sheathless access
- Rapid inflation & deflation times
- Multidurometer shaft transitions
- Pushability, torquability & trackability
- Coatings



ADVANCED CATHETERS & STEERABLES

- Braiding
- Reflowing
- Coil winding
- Laser cutting & welding
- Thermoforming
- Smart catheters
- Steerable & deflectable configurations
- Tapered shafts
- Multidurometer shafts
- Single- & multi-lumen shafts
- Reinforced shafts
- Microcatheters
- Balloon catheters

MICRO PRECISION STAMPING

- Precision stamping (micro to large)
- In-die assembly
- In-line vision systems
- Conversion & modular design
- Material thicknesses: 0.001"-0.070"
- In-line secondary processes

LASER PROCESSING

- Laser cutting
- Laser welding
- Laser marking
- Laser drilling
- Laser ablation
- Post-processing
  - Ultrasonic cleaning
  - Passivation
  - Electropolishing
  - Pickling (HF)
  - Mechanical buffing
- Optical targeting
- Automated inspection
- Automated & semiautomated parts handling

MICROMACHINING & SWISS TURNING

- CNC multiaxis milling & turning
- Multiaxis machining
- Swiss screw machining
- Metals machining
- Plastics machining
- Secondary processes
  - Wire electrical discharge machining (EDM)
  - Microblasting
  - Tumbling & deburring
  - Passivation
  - Electropolishing
  - Buffing

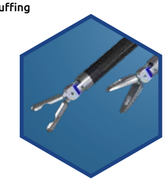
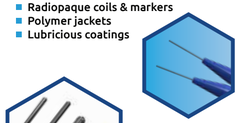


IMAGE GUIDED INTERVENTION

- General
  - Analog & digital circuit design
  - Full range of software & firmware design
  - Mobile apps
  - Console interface
- Imaging
  - Imaging & image processing
  - Lighting
  - Electrical components & visualization
  - Shafts & insertion tubes
  - Braiding & reinforcement
  - Bending for steerability
- Guiding
  - Robotic maneuverability
  - In-body navigation & guidance
- Intervention
  - Ultrasonic design
  - Acoustic engineering
  - RF ablation

GUIDEWIRES

- CNC profile grinding
- Micro-coil winding
- Stamping/flattening
- Depth marking
- Precise joining
- Tip shaping
- Radiopaque coils & markers
- Polymer jackets
- Lubricious coatings



FINISHED DEVICES & COMPLEX MICROASSEMBLY

- Adhesive, solvent & thermal bonding
- Tipping
- Pad printing
- Coating
- Ultrasonic & laser welding
- Comprehensive packaging solutions
  - Packaging design
  - Pouch & tray sealing
  - Backer cards
  - Laser labeling
  - IFU management
  - Kitting services
  - Shipper packaging
  - Palletization
- Packaging validation, including:
  - Peel testing
  - Dye penetration testing
  - Package integrity testing

METAL INJECTION MOLDING (MIM)

- High-temperature alloys: stainless steels & low-alloy steels
- Standard & customized material systems
- High-volume applications
- Designs with complex shapes & tight tolerances
- Small components (0.01-400 g)
- Surface finish: Ra 0.8-1.3 µm
- Capable of thin sections & fine details
- Secondary processes:
  - Polishing
  - Machining
  - Heat treating
  - Plating
  - Bead blasting
  - Hot isostatic pressing (HIP)
- Component design assistance
- Tooling design & manufacturing