



Medical Murray[®]
Inspired People. Inspired Products.



Company Overview

Device Development and Full Manufacturing

- Catheters & Implants
- Testing Services
- Insert Molding
- Pilot Production
- Contract Manufacturing

Helping Create Your Next Medical Device

Full Service Development Capabilities

Medical Murray provides comprehensive development services for the creation of your medical device with extensive knowledge of catheter design, implant design and catheter component assembly.

We offer original designs as well as custom processes. Our team will work with you to define every aspect of your concept.

- Design inputs for your device
- Materials and design
- Creating and testing finished devices
- Writing documentation and regulatory support



Specialized services include material selection, multi-lumen and multi-layer catheters, balloon attachment, nitinol component integration, deployment mechanisms, steerable catheters, handle design, and many more.

Vertical integration is a core strength at Medical Murray, including:

- Equipment tooling design
- 3D printing
- Braiding and coiling
- Vertical lamination
- Laser welding
- Balloon forming and attachment
- Nitinol fabrication and heat setting
- RF and ultrasonic welding
- Marker band swaging
- Plasma treatment
- Injection molding
- Pad printing

Testing Services

Let our engineers work with you to develop a custom test procedure specific to your device or component. Our onsite labs feature an extensive inventory of testing equipment to provide accurate data and analysis.

We specialize in testing to support regulatory filings, validations and market comparison studies either in conjunction with the development process or as a standalone project.

Examples of our internal services include:

- Luer testing (ISO 594, Part 1 and 2)
- Catheter testing (ISO 10555)
- Device performance testing
- Aging testing (ASTM 1635)
- Flow testing (ASTM F623)
- Balloon testing
- Package integrity testing
- Shelf life testing

At Medical Murray, we utilize standard ISO, ASTM or FDA methods. All testing is performed according to pre-approved protocols, and conforms with required ISO and FDA standards.



Your Contract Manufacturing Partner

ISO 13485:2003 Class 7 Certified Clean Rooms

Medical Murray's manufacturing facilities are dedicated to the full production of class II and III medical devices in ISO class 7 certified clean rooms, including our molding and braiding processes.

Our manufacturing solutions for components or full assemblies provide the flexibility to adjust for volume and lead time demands.

Production services include:

- Product transfer
- Process optimization and automation
- Custom tooling and equipment
- Process validation
- Component and full device assembly
- Packaging, sterilization and lot release
- Storage and distribution

All processes are strictly monitored and controlled to ensure conformance and traceability at each step of the manufacturing process.

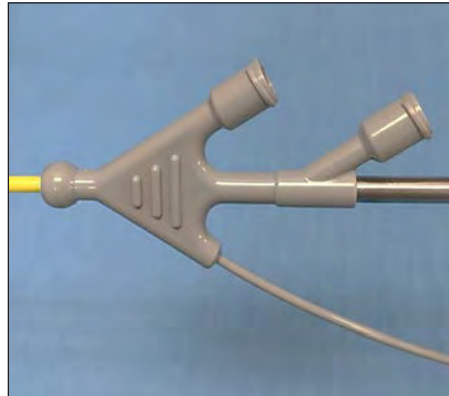
Our experienced manufacturing and quality engineers are ready to optimize your product for maximum throughput and unparalleled quality.

Prototyping Complex Parts

Molding of Microscopic and Complex Parts

At Medical Murray, we offer advanced molding technology and processes used to build world-class catheter products and intricate componentry all under one roof. Our multiple technologies in catheter manufacturing have been developed specifically to provide a competitive edge to our customers.

Medical Murray's "nano-molding" services refer to parts in the cubic millimeter range (1/10th the size of micro-molded parts), which provides the ability to mold components as small as .1 cubic millimeter. This is achieved with refined equipment and processes, which provide fast, controlled injection and short material residence time.



Molded micro components are available across a range of materials including thermoplastics, silicone rubber, standard polymers, and bioabsorbable materials.

Custom insert molding is also a core competency at Medical Murray. Insert molding over ceramics, metals, and multiple polymer materials such as rigid thermoplastic luers over soft polyurethane can provide lower cost assembly, higher reliability and improved strength.

Our insert molding examples include:

- Catheter tips
- Joints
- Fittings
- Luers
- Markers
- Lumen transitions
- Manifolds

Pilot Production

Medical Murray provides pilot production of devices for use in regulatory testing, device demos, animal studies, and clinical trials. We utilize Class 7 certified clean rooms for pilot production in all of our locations (Illinois, North Carolina and California).

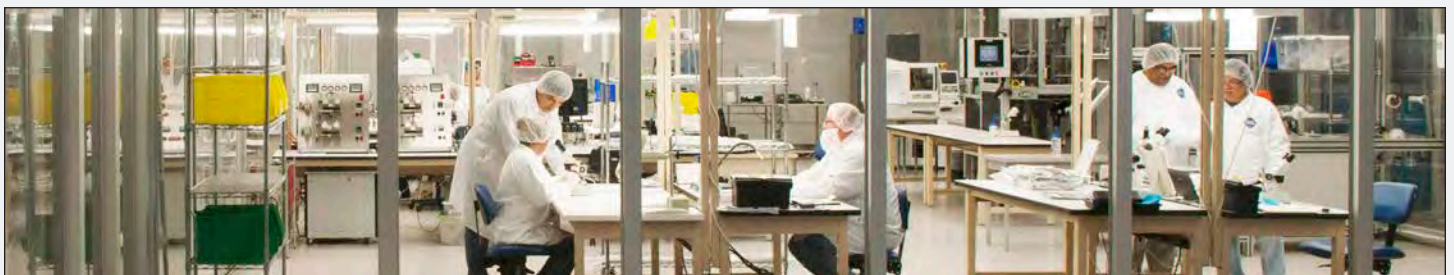
At Medical Murray, your pilot production is supported with dedicated clean rooms and production resources.

Builds are completed using released documentation and materials, utilizing an ISO 13485 quality system that ensures safety yet allows for flexibility.

The pilot manufacturing stage brings together design engineering, process development and quality systems to refine production processes and inspection requirements for volume manufacturing.

Our pilot production services include:

- Process development
- Design and construction of assembly tools and equipment
- Process FMEA
- Design Master Records
- Design transfer to manufacturing
- Process validation
- Manufacture of clinical and low volume commercial product



Our assembly team offers extensive expertise in intricate devices often requiring assembly and inspection under a microscope. Assembly expertise includes custom tipping, handle assembly, multi-layer laminations, insert molding, and much more. The Medical Murray quality team is dedicated

to ensuring that the devices we manufacture are of the highest quality, certified to ISO 13485, and are cGMP compliant.

Our quality engineers are involved in the development stages of all projects to identify and develop quality

requirements, test methods, and inspection requirements that are used to validate new products.

Whether you're looking for a finished device, component part, sterilization, bulk or packaged product, we can ramp up your product for commercial release.

Our Commitment To You

We take pride in partnering with you, and providing a full spectrum of creative ideas and technologies to bring your device from concept to reality.

- *We serve as an extension of our customers*
- *We only make products for customers and have no competing products of our own*
- *Processes, equipment and procedures are open and available to our customers*
- *Intellectual property generated with our customers is theirs*
- *Open and honest communication is one of our core values*

Contact Us For More Information

Our team would like to help you create and implement your next medical device project.

Please contact us or visit our website for more information.

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ISO 13485:2003 CERTIFIED
FDA REGISTERED

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