

**PROTERIAL**

**HPMS**

**High Performance Medical Solutions**

**Pilot to Production; Your Medical Extrusion and Cable Partner**



## HPMS is a Global Contract Manufacturer for OEMs

Dedicated to providing complete in-house medical tubing and cable solutions for surgical, catheter, endoscopy and ultrasound markets. Medical wire and tubing are vital components to many critical, life-saving devices.

High Performance Medical Solutions (HPMS), a Proterial Group Company provides in-house secondary operations, sub-assembly for catheters, medical machining and custom tooling in our vertically integrated ISO Class 8 and Class 9 Cleanrooms.

With over 30,000 ft<sup>2</sup> of clean room space, we're able to fully assemble devices and package product for faster turnaround times. Improve quality control and cost savings by choosing us for your next project.

## Our Market & Product Focus



**SURGICAL**



**CATHETER**



**VASCULAR**



**ENDOSCOPY**



**ULTRASOUND**



## Quality and Certifications

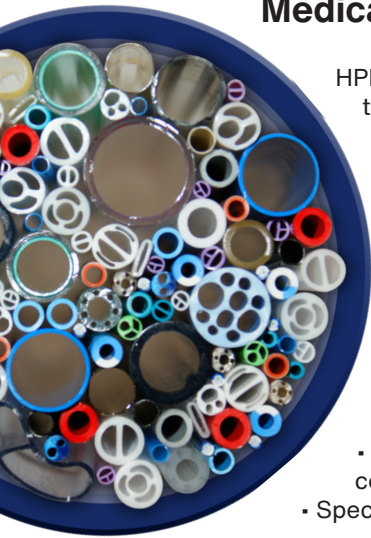


HPMS products are designed to improve the quality of life for individuals in need of medical care. From premature infants to elderly patients, our products provide vital support for a wide range of individuals. Our commitment to quality extends to our strict adherence to industry regulations, in accordance with ISO 13485:2016 standards and the FDA 21 CFR part 820 regulations.

By following these regulations, we are able to consistently produce products that are manufactured to the highest possible standards which meet the needs of our customers and the individuals they serve. We are proud to foster an environment in which we encourage continuous improvement as we strive to innovate the medical device manufacturing sector.

Our commitment to excellence extends beyond the manufacturing process, as we also provide in-process validation and support for our customers. As a result, we are proud to manufacture lifesaving tools that have a positive impact on people's lives across the globe.

## Medical Extrusion Expertise



HPMS offers a variety of complex and highly advanced tubing solutions with the ability to manufacture to the tight tolerances that today's minimally invasive designs require.

### Medical Tubing Options:

- Single-lumen, multi-lumen, multi-layer, profile tubing
- High-pressure braided tubing, reinforced tubing
- Taper / Bump tubing
- Balloon tubing
- Core Mandrel, beading tubing
- Embedded / Encapsulated wire and cable tubing
- Integrated markings, radiopaque fillers, color striping tubing
- Specialty additives and compounded materials

ABS  
Carbothane™  
ECTFE  
EFEP  
ETFE  
EVA  
FEP  
HDPE

Hytel®  
LCP  
LDPE  
LLDPE  
Nylon  
PBT  
Pebax™  
PEEK

Pellethane®  
PET  
PFA  
Polycarbonate  
Polyimide  
Polypropylene  
Polysulfone  
POM

PCDF  
PVC  
Quadralflex™  
Quadrathane™  
Tecoflex®  
Tecothane®  
TPE  
TPU  
Ultem™

## Configuration Proficiencies



2 Lumen



3 Lumen



4 Lumen



2 Lumen  
Double Bore



Tri-Layer



External  
Stripe



Embedded



Stripe  
Tri-Lumen

### Outer Diameter:

0.005 in. (0.12 mm) minimum  
0.875 in. (22 mm) maximum

### Inner Diameter:

0.003 in. (0.08 mm) minimum

### Wall Thickness:

0.001 in. (0.025 mm) minimum

### HPBT Diameter:

0.006 in. (0.15 mm) with variable pitch  
Nylon monofilament and SS flat/round wire

**Maximum Number of Lumen:** Up to 24

**Number of Layers:** Up to 3

**Number of Taper Transitions:** Up to 3



## Multi-Layer, Bump and Specialty Tubing Capabilities

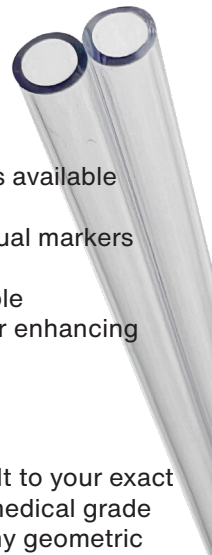
Our expertise at manufacturing bump tubes encompass the most simplistic, single lumen catheters, up to and including the most complex multi-lumen designs.

### Multi-Layer, Bump and Specialty Capabilities:

- Up to 5 layers with custom head
- Thin walled, co-extrusion, micro-tubing
- Specialty radiopacity enhancement compounds & custom fluoropolymers additives available
- Performance enhancing additives available
- Extruded, printed, or mechanically bonded visual markers
- Up to 3 taper transitions
- Precision cut lengths using automation available
- Custom loaded radiopacifiers and colorants for enhancing visibility while under fluoroscopy
- Embedded wire and cable

### Multi-Lumen Tubing:

We manufacture custom multi-lumen tubing built to your exact specifications. We utilize a vast assortment of medical grade compounds in multiple durometers, in almost any geometric configuration.





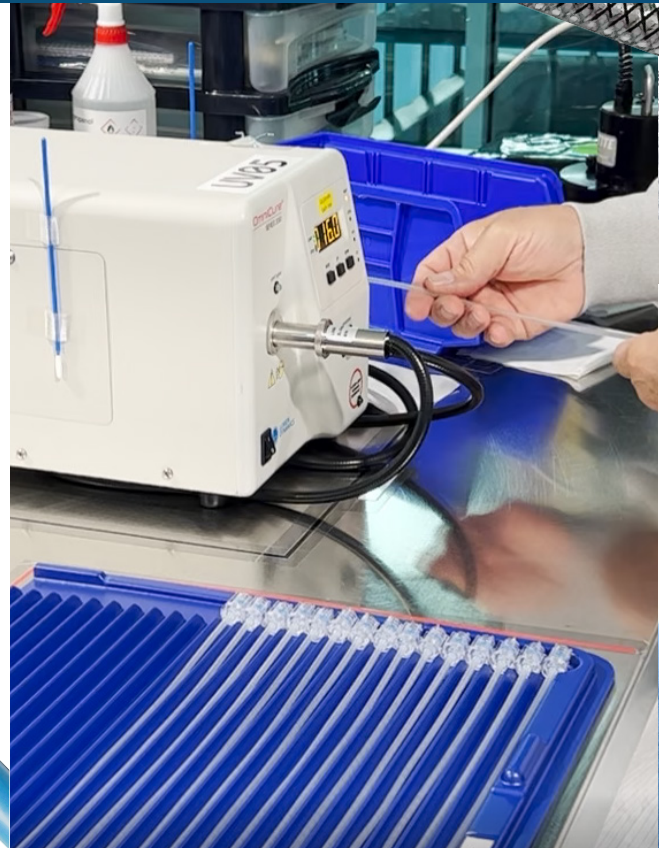
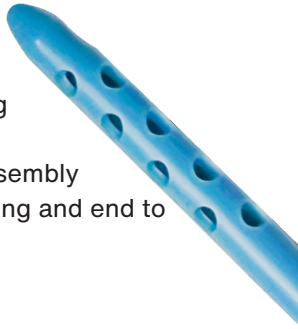
## ISO Class 8 Cleanroom Secondary Operations - Value Add Offerings

We take pride in our ability to produce highly complex and innovative tube assemblies that would otherwise not be possible with conventional manufacturing techniques.

In-house expertise and machining allows us to create quick-turn specialty fixtures and dies to support new and existing programs. In-house secondary operations reduces the device cost while allowing you to reduce your vendor base and increase velocity to the market.

### Value Added Services:

- RF tipping, flaring and thermoforming
- Hole punching, drilling and skiving
- Multi-color inline printing
- Pad printing and specialty marking
- Injection molding and component bonding
- Lamination and re-flow
- Full pre-sterilization device kitting and assembly
- Custom product labeling, custom packaging and end to end warehousing solutions
- Inventory control and Kanban programs





## Molding & Catheter Assembly

We offer custom molded solutions for braided and specialty tubing devices and are capable of working with a wide range of thermoplastic materials and tubing assemblies of varying complexity.

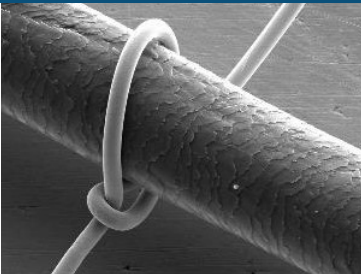
### Molding & Assembly Services:

- Class 9 cleanroom extrusion and molding
- Class 8 cleanroom for secondary operations, assembly & packaging
- Single cavity and multi-cavity tooling

### Quality and Value Added Testing

You can count on HPMS to ensure our products meet the demands of our customers. We design and manufacture the extrusion tooling in-house and our engineers are uniquely qualified to create extremely complex and precise tooling which is maintained and inspected throughout the life of the product.

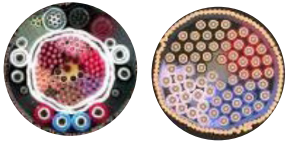
We perform inline measurement testing, lab testing and process validation as well as secondary quality checks to guarantee that every part meets or exceeds expectations of our customers.



## Fine Wire Medical Cable Leader

**We pride ourselves on offering some of the most advanced and specialized cable capabilities in the market.** Our team of experts is highly skilled in producing small, complex cables using a variety of materials, including discrete wire, micro-coaxial, twisted pairs, and twinaxials. No matter what your specific requirements may be, we can work with you to design and manufacture a custom solution that meets your product specific needs.

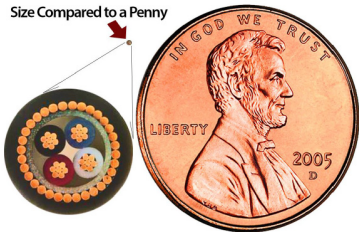
Our range of standard sizes is unparalleled, with options as small as a fine wire drawn down to 58AWG to create 50AWG conductor (7/58, 0.10 mm diameter). This level of precision and attention to detail is essential for highly specialized and complex cables.



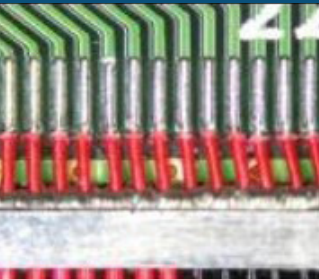
### Wire & Cable Capabilities:

- High performance conductor alloys
- Impedance or capacitance controlled
- Flex and electrical testing capability
- Hybrid-cabling for multi-purpose applications
- Research and development for next generation needs
- Standard and custom designs available

Size Compared to a Penny







## Wire and Cable Assembly and Termination

**HPMS has a proven track record of offering micro cable and assemblies for ultrasound, catheter and endoscopy.** We provide cable, assemblies and finished products built to your design for your remarkable products.

Whether you need a small batch of custom assemblies or a larger volume production run, we have the expertise and resources to get the job done right. So, if you are in need of complex cables, we encourage you to get in touch with HPMS to assist you.

### **Custom Capabilities Include:**

- Full electrical and mechanical labs to ensure reliability
- Single use and reusable designs
- Assemblies for both Distal and Proximal sections of your device
- Automated processes for high volume products
- In line and vertical soldering
- Fine pitch terminations to 100 micron pitch
- Technology roadmap for cable to 56 awg and terminations to 50 micron pitch

## Rapid Prototyping and On-Site Custom Tooling

We offer customers exceptional quality with superior cost savings, fast delivery, and a highly technical and reliable support staff. We offer in-house CNC machining, specialty materials, cable and cable assemblies and component and assembly fabrication. From concept to finished products, we're a one stop shop for your machining and fabrication needs.

Over a decade leading the medical manufacturing industry specializing in design, fabrication and delivery of quality machined components.

### Manufacturing Capabilities:

- 3,4, & 5 Axis CNC Machining Centers
- Wire & Sinker EDM Services
- MIG/TIG Welding, Fabricating, Waterjet & Finishing Capabilities
- 3D Additive Manufacturing
- Automated CMM Inspection
- Full Assembly (Electro/Mechanical) Manufacturing

### Certifications:

ISO 9001-2015 Certified  
ITAR Registered  
JCP Registered

### Primary NAICS Codes:

332710      335999  
332721      332313  
332994

**DUNS#:** 081362144

**CAGE CODE:** 79N81



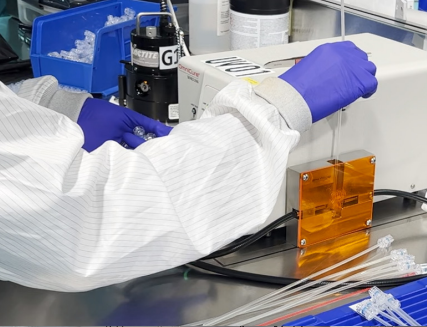
## Medical Cable Assembly

HPMS offers termination and cable assembly services with complex fine wire bundles, used in ultrasound probes, catheters and endoscopy markets.

### High Level Cable Assembly:

- Design and material proposal from component level to assembly level
- Supplier and material management
- Process and traceability management
- Overmold or bonding components
- Electrical and mechanical testing services





# High Performance Medical Solutions A Proterial Group Company

High Performance Medical Solutions (HPMS), a Proterial Group Company, is a trusted and reliable strategic partner for all phases of medical device manufacturing. Our global network allows us to integrate advanced electronic cameras and display systems into state-of-the-art medical devices, meeting the high standards of today's surgeons. Our vertically integrated approach allows us to control every step of the manufacturing process, ensuring that we deliver the highest quality products.

We specialize in the manufacturing of medical devices and extrusions for a variety of markets including endoscopic, ultrasound, cardiovascular access, surgical robotic, and more. Our ISO 13485:2016 facilities offer complete end-to-end medical device assembly and contract manufacturing services.

**From concept development and clinical trials to commercialization, our team of manufacturing experts prioritize both quality and patient safety as our top priority.**

