Global Contract Manufacturing for OEMs

Since 1910, Hitachi has developed highly specialized and innovative technologies that positively contribute to society. The High Performance Medical Solutions Division of Hitachi Cable America offers a diverse set of products and solutions designed for a wide variety of life saving applications. From our factories in the U.S.A., China, and Japan, we service a broad range of markets, from endovascular to cardiovascular, structural heart, cardiac rhythm management, electrophysiology, neurovascular, vascular access, pain management, and ultrasound. Now including the HTP-MEDS product line, acquired in 2016, we service our customers and carry on the proud traditions that our founder Namihei Odaira established.
Market & Product Focus

When it comes to servicing the medical community, Hitachi plays a critical role in providing solutions that support a wide range of applications and markets.

Our products and value added services are critical to supplying OEMs with the necessary components and assemblies that enable many lifesaving technologies. From cross-linked PTFE to high performance, heat resistant, plastic optical fiber (POF), to custom tubing for use with virtually any type of medical device, Hitachi has the unique breadth of expertise to provide strong value to our customers.

Through strong collaboration and proactive communication, we pride ourselves in delivering high performance medical solutions, on time and with the quality expected from the Hitachi brand.
Medical Tubing

High Performance Medical Solutions (HPMS) produces a wide variety of complex and highly advanced tubing. We manufacture to the tight tolerances that today’s micro-tube designs require. Applications requiring complex geometries, column strength and stiffness, bondability, flexibility, specific tensile and elongation, kink resistance, and chemical resistance are common.

**A wide range of styles and materials are available:**

- Single lumen, micro-lumen, and multi-lumen tubing
- Multi-layer, multi-durometer and solid core tubing
- Braided tubing and high pressure braided tubing
- Profile and taper / bump tubing
- Integrated markings / striping and radiopaque tubing
- Inflatable balloon tubing
- Embedded and encapsulated wire and cable tubing
- Specialty additives and compounded materials
- Common resins include Polyurethanes (TPUs), PVC, PFA and FEP Fluoropolymers, Polyolefins, PEEK, Pebax™, Polysulfones and Polyamides

Pebax™ is a registered trademark of ARKEMA CORPORATION and registered by ATO CHIMIE CORPORATION.
We specialize in manufacturing sophisticated braided and non-braided low and high pressure tubing. Diagnostic tubing and fluid management products are used in a wide range of procedural applications such as Interventional Cardiology, Radiology, Neurovascular, Waste Management, Vascular Access Procedures, Contrast Injection, Pressure Monitoring, Stent Placement Devices, Inflation Tubing, Fluid Administration & Vacuum Procedures. Braiding helps to improve burst pressure resistance, adds column strength, and reduces kinking.

**Braided tubing options:**

- Standard styles from 500 to 1,200 PSI (3.5 N/mm² to 8.3 N/mm²)
- Nylon reinforcement
- Flat and round Stainless Steel reinforcements
- Variable pitch, braid angle control and bi-directional winding
- Multi-layer / multi-lumen / multi-durometer capabilities
- Available in a wide range of materials and properties
- Micro-lumen capabilities
- PTFE, Polyimide and lubricious liners
- Customized lengths available
- Luer and connector assembly
Advanced Specialty Tubing

HPMS supports a wide variety of complex and advanced tubing. Styles such as multi-layer, multi-lumen and bump (or tapered) tubing are common. Specialty liners like PTFE and Polyimide (PI) can be easily incorporated into multi-layer tubes for performance improvement. Our expertise at manufacturing bump tubes (shown in the lower left) and multi-durometer tubes (shown in the upper left) encompasses the most simplistic, single lumen catheters, up to and including, the most complex, multi-lumen designs.

**Multi-layer, bump and specialty capabilities:**

- Up to five layers
- Thin walled, co-extrusion, micro-tubing
- Durometer changes along tube length
- Specialty radiopaque additives available
- Performance enhancing additives available
- Extruded or printed visual markers
- Up to three taper transitions
- Material striping for additional visibility
- Precision cut lengths available
- Embedded or discrete wire and cable
Micro-lumen tubing is continuing to decrease in size and increase in complexity. Like our larger style tubing, High Performance Medical Solutions micro-tubing can be manufactured in a wide variety of resins, styles, and form factors to meet your needs.

**Capabilities:**

- Single, multi-lumen, and multi-layer configurations
- Specialty radiopaque additives and striping
- Tapered transitions from proximal to distal
- Integrated wire and cable possible
- Braided configurations available
High Performance Medical Solutions offers custom molded and assembly solutions for braided and specialty tubing devices. We are capable of working with a wide range of thermoplastic materials and tubing assemblies of varying complexity.

**Molding and assembly services:**

- White room molding
- Class 8 cleanroom for secondary operations, assembly and packaging
- Single cavity and multi-cavity tooling
- Full device packaging
- Inventory control and Kanban programs are available
Secondary Operations

We take great pride in our ability to produce highly complex and innovative tube assemblies and medical devices 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. This process reduces the total device cost while allowing you to reduce your vendor base and increase your velocity to market. Our assembly services are performed in an ISO Class 8 cleanroom environment.

Value added services:

- RF tipping, flaring, and thermoforming
- Hole punching, drilling, and skiving
- Pad printing and specialty marking
- Injection molding and component bonding
- Full device assembly
- Full device packaging
- Inventory control and Kanban programs
In-house Tooling

HPMS offers a wide range of medical and clean industrial machining services for standard and exotic materials. We specialize at manufacturing highly innovative extrusion tooling and downstream tube processing equipment. Since our fabrication group is co-located with our extrusion business in Rhode Island, U.S.A., our tubing customers receive a significant velocity to market advantage when it comes to prototyping, production, and repairs.

**Machining services and capabilities:**

- 3D additive metal printing and machining
- Water jet cutting (8 ft x 13 ft (244 cm x 396 cm))
- Milling, turning and precision EDM
- Welding (MIG, TIG, arc)
- Brazing, plasma cutting, and fabrication
- Optical / CMM inspection
- Finishing, polishing and ultrasonic part cleaning
Hitachi Metals Group Ltd., a division of Hitachi Ltd., plays a critical role in supplying a wide array of innovative high-performance materials for a broad range of markets. Products such as specialty alloys, magnetic materials and batteries are essential to the performance of medical systems. Our understanding of materials and specialty alloys ensures that our medical cables achieve the stringent requirements of our customers. The image to the left shows a 58 AWG, 10 micron wire wrapped around a 80 micron human hair. The images below show seven of the same wires spirally wound to form a 50 AWG single conductor core.

**Wire and alloy capabilities:**

- Fine wire as small as 58 AWG (0.010 mm)
- Hitachi alloys offer high conductivity, outstanding tensile strength, heat resistance and improved flexibility
Hitachi is a world leader in fine wire medical cables, offering some of the smallest, most complex cable capabilities on the market. Whether the need is for discrete wire (solid or stranded), micro-coaxials, twisted pairs, twinaxials, or fiber optics, our team has expertise with all of these products. We offer a full range of standard sizes as small as 50 AWG (7 of 58 AWG) (0.15 mm diameter) using high-strength silver-plated or tinned-copper alloys with insulations that include PFA rated to 260°C. PFA dielectric provides highly stable properties for outstanding signal integrity, with low capacitance, and consistent controlled impedance resulting in smaller diameter cables with improved flexibility and product life.

**Wire and cable capabilities:**

- Standard and custom designs available
- High performance conductor alloys
- Wide variety of jacketing and shielding options
- Fine wire preparation and fine pitch soldering (as small as 50 AWG)
- Full cable assembly services
- Hybrid cabling for multi-purpose applications
- Research and development for next generation needs
One challenge with high performance cable is dealing with the cable preparation and termination to prevent long term performance degradation. Hitachi has a proven track record of working with micro-wire cable and tight pitch terminations for ultrasound and miniature electronic devices. We offer semi-finished and finished build to print solutions for some truly remarkable products.

**Services and capabilities:**

- Fine gauge wire preparation and soldering for 36 to 46 AWG wire (with 48 & 50 AWG finer gauge processes being developed)
- Low volume and high volume assembly services
- Termination expertise for flexible and rigid boards with discrete components, terminated micro-connectors or direct wire bonding
- Watertight sealing and device encapsulation
- Micro-camera assemblies for endoscopy applications
- Offering custom designed cables for product specific needs
Hitachi Metals has a long history of cutting edge research and development. Our new Global Research & Innovative Technology Center (GRiT) in Japan has been established to develop innovative technologies and next generation materials for 3D Additive Manufacturing (3DAM) metal components and other specialty needs. Hitachi understands the future that this technology offers and has taken significant steps to develop novel metallic powders and custom processes for manufacturing complex products that deliver improved part performance and product to market acceleration. Thanks to this facility and our in-house machining and fabrication center in Ashaway, Rhode Island, we can now offer customers collaborative development services for those considering 3DAM metal printing as an alternative to conventional manufacturing methods or for parts that were previously not viable.

**Services and technologies:**

- Part to art 3D model generation
- Specialty alloys and powdered metal materials for 3DAM printing
- Computational simulation and design analysis
- Selective Laser Melting (SLM) - using EOS M290
- Electron Beam Additive Manufacturing (EBAM) - using Sciaky EBAM110
- Selective Electron Beam Melting (EBM) - using Arcam A2X
- Laser Metal Deposition (LMD) - using DMG Mori Lasertec 65 3D
- Printed part analysis and process optimization
- Post process machining
Hitachi Social Innovation
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Machining & Fabrication Center - Ashaway, RI U.S.A.
Braided Tubing - North Stonington, CT  U.S.A.
Cable Production - Manchester, NH U.S.A., Suzhou, China & Ibaraki-ken, Japan
High Volume Cable Assembly - Suzhou, China