mmt

MEDICAL MANUFACTURING TECHNOLOGIES

YOUR SOURCE FOR

Catheter & Guidewire Manufacturing Solutions

www.mmt-inc.com

Medical
Manufacturing Technologies

mmt
MEDICAL MANUFACTURING TECHNOLOGIES

Your sole source solution for automated, process-driven medical manufacturing.

Medical Manufacturing Technologies (MMT) offers manufacturing-as-a-service that brings together applications expertise, technical solutions, and aftermarket support to revolutionize medical device manufacturing.

We design the most efficient manufacturing processes, from ideation and proof-of-concept through production and optimization, to solve the world's most complex medical device challenges. As your partner, our Total Care service organization is committed to the life of your applications.

At MMT, we understand that patient safety is paramount to the production of your devices; our integrated approach ensures unmatched, ultrafine precision and end-to-end quality control. Streamlined manufacturing opens doors to innovation without limitation – and ultimately, enhances lives.

Equipment | Service Support | Special Manufacturing

Catheter Manufacturing Solutions

Catheter Tipping, Flaring, Bonding

Quantum

Cathtip Tipping Technologies

visit www.cathtip.com for more details

The Quantum is a tabletop tipping machine designed to produce superior outputs expected of the CATHTIP standard. Our state-of-the-art, precision catheter forming systems produce the highest quality parts with speed and consistency. Produce a wide range of applications – flares, flanges, angular welds, bonds, multi-lumen shape transitions, butt welds, balloon to catheter welds, neck downs, soft-tip fusion, metal-to-tube adhering, sheaths, dilators, radio-opaque, strain relief bonds, swaged metal needle guides, tube-in-tube bonds, etc.

Key Features

Streamlined for Production	Modular “black box” tooling design
Tailor-engineered	Store up to 256 recipes
Extrusion sizes from 1FR to 34+ FR	Multi-stage heating capability
Proprietary, durable carbide tipping dies	

Magnum

Cathtip Tipping Technologies

visit www.cathtip.com for more details

The Magnum provides the most flexible RF architecture on the market, capable of tip forming, flaring and bonding in production or R&D settings. Our state-of-the-art precision catheter forming systems produce the highest quality parts with speed and consistency. The Magnum can achieve flashless tips, smooth bonds, and exacting geometry with virtually all thermo-plastic materials.

Key Features

Flexible for R&D and production environments	Modular “black box” tooling design
Store up-to 10,000+ recipes	Generate temperatures up to 650 °F
Extrusion sizes from 1FR to 34+ FR	Multi-stage heating capability
Proprietary, durable carbide tipping dies	Ability for remote access & troubleshooting

Glass Die Tipper

R&D Engineering Technologies

visit www.randde.com for more details

The Glass Die Machine automates the process of pushing a catheter up into a glass die mold, then heated and formed to the tip of a specific mold and radial shape. The Glass Die machine enables a chilling process to occur where the tipped catheter can separate and be removed from the glass die machine.

Key Features

Streamlined for Production	Modular “black box” tooling design
Tailor-engineered	Store up to 256 recipes
Extrusion sizes from 1FR to 34+ FR	Multi-stage heating capability
Proprietary, durable carbide tipping dies	

Catheter Drilling, Skiving Hole Punching

Accu-Drill

SYNEO Hole Drilling/ Punching Technologies

visit www.syneoco.com for more details

SYNEO Accu-Drill and Accu-Punch equipment solutions are advanced, space-efficient solutions for drilling burr-free holes in a wide range of single and multi-lumen tubing materials such as Polyvinyl chloride (PVC), Low-density polyethylene (LDPE), PEEK, Polytetrafluoroethylene (PTFE) and Pebax®. Accu-Drill and Accu-Punch machine solutions are heavily utilized in clean room manufacturing environments where catheter punching and hole drilling applications exist.

Key Features

Efficient control and collection of hole plugs and skive debris	Spindle speed: 0 – 4,000rpm
Drill depth setting resolution: .001” (.025mm)	Drill Chuck Run-out: .0002” (.005mm) TIR
Drill chuck: .125” (3.17mm) diameter	Configurable for any type of catheter requirement

Cathtip 400 Series

Cathtip Hole Punching Technologies

visit www.cathtip.com for more details

The 400 Series is a precision hole drilling machine that delivers results to the highest industry hole quality standards and is custom built to suit your application’s specifications.

- Hole sizes down to 0.015”
- Multi-lumen configurations ranging from 2-8+ lumens (able to precisely locate & perforate individual lumen)
- Materials from soft silicones to harder polymers

Key Features

Flow Thru™ core evacuation	Long drill life – hardened SS440C
Razor sharp cutting edges – drill edge diameter sharpened to +/- 0.0007”	Safety light curtain
Burr-free holes	Multi-stage heating for fully automated capability

Flex-Drill

Cathtip Catheter Hole Punching Technologies

visit www.cathtip.com for more details

Flex-Drill by CATHTIP is the most flexible, cost-effective option for hole forming in catheter prototypes and early development applications.

The drill can be mounted or handheld and operated by a foot pedal making it quick and easy to try new hole diameters or patterns in a variety of different tubing materials. The Flex-Drill utilizes the superior Flow Thru™ bit technology found in CATHTIP’s hole forming machines allowing for easy core evacuation and a clean workstation.

Key Features

Mountable in drill press with motion platform	Panel dial set speed from 100-2000RPM
Over two dozen drill bit sizes from 0.015 “-0.197”	Interchangable with SYNEO punch inventory
Fine tune depth stop	Collet-style drill head for punches & ejector pin (optional)
Robot arm integration (optional)	

Catheter Manufacturing Solutions

TUBE & WIRE CUTTING SOLUTIONS

Accu-Cut 202L

SYNEO Tube and Wire Technologies

visit www.syneoco.com for more details

Highly regarded among medical device manufacturers for its precision, speed, and adaptability, the Accu-Cut 202L Automated Tube Cutter is known for its clean, square corners and precise lengths with convenient output.

Key Features

Square cuts and precise lengths on both hard and soft materials	Fast, repeatable setup
Customizable	Automation of stick- and spool-fed materials Available
Angle cuts, dual cuts, slitting, skiving, drilling and inspection	Automatic index crush control
Clean Air Deionizer and Scrap Eject	Cut length range: .020-300” (0.51-7620mm)
Cut and slit length range: 0-100” (0-2540mm)	Length handling range: 2-1000” (5-2540cm)

Accu-Cut 700L

SYNEO Tube and Wire Technologies

visit www.syneoco.com for more details

The Accu-Cut 700L Automated Braided Tubing Cutter brings the engineering of the Accu-Cut 202L to difficult materials, including braid-reinforced tubing, stainless steel, polycarbonate and nylon 12. The 700L features a high precision automatic indexer, which provides repeatable lengths, and a full-color LCD touchscreen. It is programmable and has many options available to fit your requirements.

Key Features

Repeatability (+/-): .007” (0.18mm)	High speed option: 45”/second (114cm/second)
Automatic indexer; no mandrel necessary	Low-cost, easy-to-change blade
Cut length range: .050-72” (1.27-1829mm)	HMI: 7” full color LCD touchscreen
Standard deviation: .0003” (short lengths) (0.08mm)	Length handling range: 2-100” (5-254cm)

Accu-Cut 202W

SYNEO Tube and Wire Technologies

visit www.syneoco.com for more details

The SYNEO Accu-Cut 202W automated wire cutter is a high precision automated medical wire cutter that provides the cleanest cuts for Stainless Steel, Nitinol, and Titanium wire, flat wire, and coils.

Key Features

Repeatability (+/-): .2-.5% of total cut length in most applications	High speed option: 44.882”/second (114cm/second)
Standard deviation: .0005” (short lengths) (0.013mm)	Low-cost, easy-to-change blade
Maximum blade force: 20lb (9.07kg)	Cut and slit length range: 0-100” (0-2540mm)
Design annual usage: 10 million cycles	Length handling range: 2-100” (5-254cm)

TUBE AND WIRE FEEDING SOLUTIONS

Accu-Feed 110

SYNEO Tube and Wire Feeding Technologies

The dynamic Accu-Feed 110 Stick Tubing and Wire Feeder provides high speed, precise stick feeding of wire, metal and plastic tubing and metal rods for medical applications. This machine can feed and hold at an accurate position, or can feed until a handoff signal is received. The 110 can be paired with Syneo machines to rotate and process parts. It can communicate with and control many processes including centerless grinding, cutting and trimming, marking, tip forming, testing, measurement and inspection, insulation removal and ablation and assembly. The 110 can also act as an interface, such as to download control programs to other equipment.

Key Features

Fast, accurate part feeding	Integrates with a wide range of processes
Can process a range of material types, lengths and widths	One operator can run more than five machines
Minimum length: 8” (20cm)	Maximum length: 48” standard; 96” optional (1m standard; 2m optional)

visit www.syneoco.com for more details

Accu-Feed HPD

SYNEO Tube and Wire Feeding Technologies

The Accu-Feed HPD High Performance Dereeler is designed for large spools and heavy gauge materials. Its large dancer arm, stronger drive transmission and revised part path eliminates reverse-bending during the feed process, which is ideal for olefin, Teflon®, and heavy gauge materials.

Key Features

Designed for high-volume, critical tolerance manufacturing	Precision ball-bearing construction for low dancer arm friction
Torque-limited for safety	Fine tune depth stop
Maximum spool diameter: 17.75” (0.45m)	Incorporates static-reducing technology for cleanliness
Maximum spool width: 10” (0.25m)	Maximum spool weight: 12 lbs. (5.4kg)

visit www.syneoco.com for more details

Accu-Feed LTD

SYNEO Tube and Wire Feeding Technologies

The Accu-Feed LTD Low Tension Dereeler is designed to provide constant strain, low tension payout of tubing to an Accu-Cut or other machine for high volume, critical tolerance manufacturing operations. It features a low mass, non static proportional speed dancer arm. The LTD is torque-limited for safety and does not require any electrical connection to its host machine.

Key Features

Designed for high-volume, critical tolerance manufacturing	Precision ball-bearing construction for low dancer arm friction
Incorporates static-reducing technology for cleanliness	Maximum spool width: 10” (0.25m)
Maximum spool diameter: 17.75” (0.45m)	Maximum spool weight: 12 lbs. (5.4kg)

visit www.syneoco.com for more details

Catheter Manufacturing Solutions

BALLOON MANUFACTURING

BFMS-500-S2

MPT Balloon Forming Technologies

visit www.mpteurope.com for more details

The Split Mold Balloon Forming Machine (BFMS-500- S2) is the third machine in a range of balloon forming machines that is being developed by MPT Europe BV and has full servo control on the proximal and distal axis. This allows for precise and fast stretching of the parisons during the balloon blowing process. The axis have force control and individual loadcell systems allowing forces to be monitored and used as control parameters during the process.

Key Features

Quick exchange of molds	Parison pre-heating
Active pressure drop control	Stretch force: 500 N max
Self aligning high force distal and proximal clamps	Full servo-controlled axis for repeatable and reliable stretching
Internal pressure booster	Flexible Process Interface

PTF-240 - M

MPT Balloon Pleating & Folding Technologies

visit www.mpteurope.com for more details

The MPT Balloon Pleating and Folding equipment line can process balloons up to 300mm.

The PTF-240-M is a fully automated machine and can pleat and fold balloons with a length of approx. 220 mm. The balloon products are clamped on a stable product table with automatic positioning using stepper motors.

Key Features

Servo controlled zero gap fold head with stainless tool steel blades and high-wear resistant low friction coating.	Innovative design for quickly exchanging the setup from 3- ,4- ,5- or 6-pleats.
10” color touch panel interface with parameter setting & recipe control.	Max. balloon length: Approx. 200 mm (depending on cone angles).

PSM - 500 SD

MPT Parison Stretching Technologies

visit www.mpteurope.com for more details

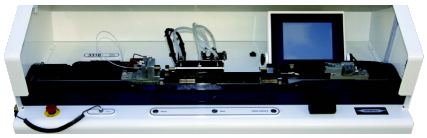
Parison stretching is an integral part of balloon blowing. Therefore, MPT has put its innovative design capability into the build and design of the PSM-400-SD parison stretching machine.

Key Features

Easy to change split die with stable and robust design for reliable production.	Fast, powerful servo-controlled axis for repeatable and reliable stretching of the parison materials during the forming process.
10” color touch panel interface with parameter setting & recipe control.	Easy-to-use interfacing software with recipe control.

BALLOON MANUFACTURING

BFM-3310 — Balloon Forming Machine



The Interface BFM-3310 Balloon Forming Machine is a computer-controlled system that expands upon a continued standard of excellence with ever-increasing capabilities and options. The BFM-3310 is a bench-top system designed to produce a variety of high-strength polymer balloons. The balloons are formed from precision extruded balloon tubing inside a beryllium copper mold. The BFM-3310 provides very accurate and repeatable control for processing high-quality balloons with tight tolerances in an extensive variety of sizes and shapes.

CPS-1000 — Computerized Parison Stretcher

The Interface CPS-1000 is a system designed to stretch or neck-down tubing parisons in preparation for the balloon-forming process. It is easily programmable through the tilt touchscreen and capable of storing multiple program parameters with an operator lock-out option.

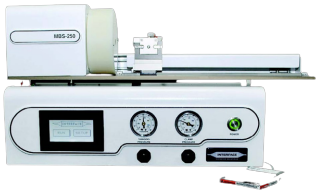
TBW-500 — Tube Welding Machine

The TBW-500 QX Tubing Welding Machine is a benchtop system that welds a variety of tubing sizes and materials. It is designed to weld similar polymer components such as inner lumen to distal shaft or balloon distal and proximal necks to the catheter shaft.

DFW-1000 — Dual Flute Wrapper

DFW-1000 dual flute wrapper provides a minimal profile-wrapped balloon for catheter manufacturing. It has a top-loading, pivoting catheter platform to precisely control the positioning of the catheter for both fluting and wrapping operation. The DFW-1000 is PLC-controlled with multiple storage programming configurations. It has password lockout protection and a heater burnout detection feature. It precisely controls individual blade temperature, closed and open diameter, and dwell time. Custom-designed and interchangeable fluting and wrapping modules accommodate a wide range of balloon diameters and lengths.

MBS-250 — Marker Band Swaging



The MBS-250 Marker Band Swager is compact and clean-room ready with 360° swaging performance for gradual and smooth diameter reduction of marker bands for catheter production. The swaging equipment offers superior performance and no striations or deformations to the swaged parts.

Catheter Manufacturing Solutions

STENT CRIMPING

CRF-200-PS

MPT Stent Crimping Technologies

The CRF-200-PS is a stable stent crimping system with film protection for the processing of drug eluting self expandable stents. A unique 4-film protection system is combined with the stable MTP Europe BV 8 blade stent crimper design. Designed for self-expandable and covered stents.

Key Features

4 film routing with easy feed-through and setup is the only reliable way to ensure you have no cross contamination of stents.	Fast and strong full servo controlled axis for repeatable and reliable transfer of the stents into the delivery systems.
Integrated safety light with intuitive user interaction.	Graphical User Interface for easy access to process cycle options.
10” color touch panel	Online support and updates via internet.

visit www.mpteurope.com for more details

CR-150

MPT Stent Crimping Technologies

The CR 150 Stent Crimping Machine is developed for the crimping and transfer into the delivery system of self-expandable stents up-to 120 mm length with a maximum diameter of approx. 20 mm.

Key Features

Exchangeable pusher rods & delivery system holders for various stent diameters	Stent crimping head can deliver forces up to 1000 N radial while maintaining an even diameter over the length of the head
Automatic stent loading with cradle system - no need to touch the stent	10“ full color touch screen user interface for access to the machine parameters
Easy calibration	Stable, robust design

visit www.mpteurope.com for more details

CR-240-SA

MPT Stent Crimping Technologies

The CR-220-SA Stent Crimping Machine is developed for the crimping and transfer into the delivery system of self-expandable stents up to 200 mm length with a maximum diameter of approx. 30 mm.

Key Features

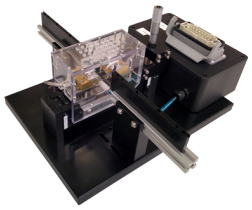
Double camera system integrated	Servo controlled stent crimping head with Zero Gap technology.
Exchangeable pusher rods and delivery system holders for various stent diameters.	One-point automatic diameter calibration function for accurate calibration in seconds.
15.5” user interface with recipe control	Full process data logging to the internal PC system - transfer via USB.

visit www.mpteurope.com for more details

CATHETER BONDING

Split Die Bonder

R&D Engineering Bonding Technologies



The CT Split Die Bonder is a soft tip bonding system that butt-welds multi-segmented catheters. This system is designed to provide a reliable, fast and economical bonding solution for single use products.

Different die configurations

Hot jaw heater available	Different die configurations
Tool can be customized to customer sizing dimensions	Compact for worktop benches

visit www.randde.com for more details

Hotbox

R&D Engineering Bonding Technologies

The CT HOTBOX configures with other CATH-TECH equipment products. The CT HOTBOX offers improved yields consistent with normal standards. It provides ideal product positioning of the thermal nozzle to give operators the capability to achieve highly precise tube and shaft bonds with increased reliability. It is useful in operating under strict process controls. Our Hotbox comes with compatible guide inserts, and modifications can be made on the Y and Z axis to refine accuracy and accommodate a wide variety of product configurations.

Key Features

Compact for worktop benches	1000°F temperature controller
Ergonomic for ease of use	Cooling system can be on consistently or foot pedal controlled

visit www.randde.com for more details

Thermal Bonding - BT-NG

MPT Bonding Technologies

Robust and stable thermal bonding machine designed to provide the user with an effective and reliable production machine for bonding all sorts of balloon and catheter components with minimal cost of ownership. The BT-NG machine is a thermal bonding machine based on the hot-jaw principle. It incorporates 25 years of experience with the thermal bonding process. The small stainless steel dies used in the machines have accurate temperature control and heat up very fast.

Key Features

Quick exchange die-unit for easy switching between various products	Automatic temperature adjustment support switching die cavities for fast heating and stable stainless steel dies
10” color touch panel interface with parameter setting & recipe control	Easy to use interfacing software with recipe control - barcode scanners are supported
Standard color camera with recipe driven crosshair options for easy alignment of the products by the operator	Stepper position controlled die unit for recipe driven alignment and fast positioning setup

visit www.mpteurope.com for more details

Catheter Manufacturing Solutions

CATHETER LAMINATING

Cath-Tech Reflow

R&D Engineering Reflow Technologies

visit www.randde.com for more details

The CT Reflow Chamber is R&D Engineering's standard machine that delivers strictly controlled and conventional heated chamber while navigating down tubing at a precise and regulated speed. This machine provides high repeatable and uniform laminations of medium to long-length catheter shafts.

Key Features

8 or 10 chambers	Capable of multiple Traverse speed and length settings within single cycle.
No special ventilation needed.	Loading elevator

311 Quad Catheter Laminator

EBD Lamination Technologies

visit www.randde.com for more details

EBD 311 Quad Catheter Laminator shrinks catheter tubing faster than the competition. Designed for vertical operation, its patented hot air circulation process contains the heat within the system, maximizing the time at temperature for faster processing. By improving accuracy of all controlled parameters, this machine can increase productivity through reduced rejects and faster processing speeds.

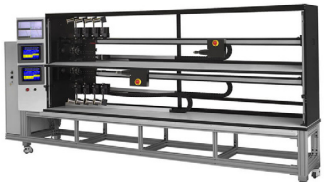
Key Features

Two vertical actuators each support a double lamination chamber assembly and move parallel to the suspended catheter.	Temperature tolerance/error/accuracy: +/- 5 deg C.
Multiple speeds in multiple ranges per stored recipes	Lamination chamber assemblies maintain a constant temperature.

COIL WINDING

Multi Filar Coil Winder

EBD Coil Winding Technologies



visit www.ebdesign.com for more details

The 924 dual head, multi filar coil winder machine uses a vision system to wind fine filaments around a spinning mandrel and produce multi filar micro coils with up to 8 filars. EBD coil winders allow exacting control of all winding parameters, including programmable wire tension – capable of tight precision down to extremely low values.

Key Features

Wind filament between .0001" to .015"	Limit travel distance & mandrel length in recipe setting
Store up to 250 process recipes.	DIN 100 filament spool size
Brushless servo drives on traverse & both mandrel ends.	Expand to 6 filars per head and up to 200" of traverse travel.

MARKING, PRINTING, ABLATION

Accu-Lase

SYNEO Laser Marking Technologies

The SYNEO Accu-Lase V200 Automated UV Laser Processing System allows for greater process capability in precision tube cutting of polyimide tubing and complex hole making, as well as polymer marking. The V200 is a fully-automated laser micromachining system, allowing the operator to batch load parts, which are singularly picked up and fed by a vacuum pick head.

Key Features

UV laser – optimal for laser micromachining and laser cutting of polyimide parts.	Automatic mandrel insertion for tubing provides quality and helps protect opposite wall
Vision system allows for easy viewing of the process.	Capable of complex shapes, marking and cutoff of polymers and metals.

visit www.syneoco.com for more details

Accu-Lase System

SYNEO Accu-Lase Automation Technologies

The UV Laser Workstations enable greater process capability in precision marking, tube cutting and complex hole making. SYNEO's Accu-Lase products target a wide range of materials, including polyimide and Pebax tubing, as well as nitinol and stainless wire. The automated laser processing systems are available in integrated pick-feed-lase-inspect-bin configurations (V200X) and in a stand-alone workstation (V200).

Key Features

Integrated galvo scanner for near infinite pattern/ablation creation.	Integrated X and R axes allowing automatic positioning of part to lase position.
Flexible solution for laser processing of hypotube, NiTi, SS wire, and polymer tube, and injection molded components.	PC or PLC Interface controls.

visit www.syneoco.com for more details

Accu-Blast

SYNEO Sandblasting Technologies

The Automated Microblasting System provides precise, fully automated media ablation of coated wires and tubes. Targeted applications include oxide layer removal, coated medical wire ablation, coating removal, surface roughening for adhesion and stripe making for visual identification (marker bands).

Key Features

Recipe-driven, programmable positioning for OD abrasion of a wide range of polymer or metallic tubes/wires with barcode reading capability.	Ideal configuration for ablating coated wires and surface roughening of hypotubes and other off-form components.
Full-color, touch-screen HMI.	Closed loop motion allows for accurate positioning of blasted zones.

visit www.syneoco.com for more details

Catheter Manufacturing Solutions

TESTING

PT-3070

Hydraulic Pressure Tester

The PT-3070 is ideally suited for testing small plastic pressure-retaining components such as welded or bonded plastic components and tubing assemblies that are typically encountered in many disposable medical devices, i.e. balloon catheters. Tubing, small valves, fittings, balloons, etc. can be tested for burst, leak, fatigue, pressure or volume compliance, and flow resistance. The unit can measure and plot pressure and volume compliance of elastomeric balloons, measure inflation and deflation times of balloon catheters, such as PTCA and PTA, and determine stent deployment characteristic, etc.

GPL-501B

Testing - Gas Pressure Leak Tester

The Interface Gas Pressure Leak Tester, Model GPL-501, is a tabletop machine used for non-destructive leak testing of catheter components using dry nitrogen gas. Nitrogen gas is inert so there is no residue, water spots, or water droplets on catheter components, making it ideal for testing of finished devices.

GPL-5020

Testing - Gas Pressure Leak Tester

The Interface Gas Pressure Leak Tester, Model GPL-5020, is designed for rapid, non-destructive testing of catheters. Its modular construction allows for expanding the number of test ports from one to twenty, in multiples of five. Each test port is fitted with a small isolation solenoid valve, allowing each catheter to be tested independently. The system can also perform vacuum leak testing of catheter/stent assemblies to verify the integrity of a balloon after stent crimping.

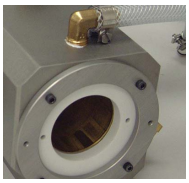
HPT-1000

Hydraulic Pressure Tester

The Hydraulic Pressure Testers provide critical hydraulic test functions for balloon catheters and components, including tubing and balloons. The HPT-1000 is easily programmable with a high visibility vacuum florescent display and four navigation keys.

PARTS/TOOLING

Water Jacket Assemblies



Interface Catheter Solutions offers a full line of Water Jackets to be used with our Balloon Forming Machines. Each Water Jacket accommodates a range of mold sizes. The water jackets are interchangeable and can be installed in minutes. This modular approach allows one to form balloons ranging in size from 1.5mm x 10mm long to 18mm x 247mm long to 40mm x 150mm long on the same machine by simply changing the mold and water jacket.

Specialized Punching Solutions

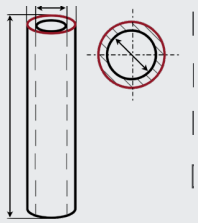
Specialized punching tools are required to make polymorphic geometries ranging from triangles, rectangles, diamonds, ovals, and others. With over 20 years of punch design and manufacturing experience combined with robust internal machining capabilities, we address the most challenging hole making applications. Regardless of punch geometry, our punches feature cutting edges sharpened with SYNEO's Hollow Core Sharpening Technology.

Hole Making Solutions

Polymer Tubing and Catheter Manufacturing Applications - We work closely with customers to evaluate hole making and skiving applications to determine the best cutting tool to achieve device specifications. Our team will analyze the optimum blade raw material, tip style, dimensions and coating, and recommend punches or coring blades to achieve optimal hole quality, eliminate risk of burr formation, and maximize tool durability for each hole application.

Tissue Cutting and Surgical Device Applications - Coring blades featuring our Hollow Core Sharpening Technology minimize undercut tissue distortion, create a superior wound architecture for quicker healing, minimize downward pressure needed for the incision, maximize tissue separation and increase the probability of complete plug extraction.

1. SHAPE CHOICE

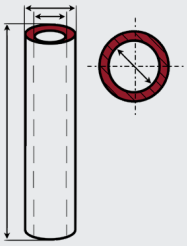


- ☐ ROUND
- ☐ OVAL
- ☐ FORMED
- ☐ CUSTOM

OPTIMIZED HOLE MAKING SOLUTIONS

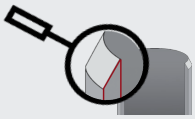
Not all holes are created equally. Specialized punching tools are required to make polymorphic geometries ranging from triangles, rectangles, diamonds, ovals, and others. Our 20+ years of punch design and manufacturing experience combined with robust internal machining capabilities can address the most challenging hole making applications. Regardless of punch geometry, our punches feature cutting edges sharpened with the SYNEO Hollow Core Sharpening Technology.

2.TIP PROFILE



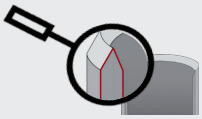
INSIDE CUTTING EDGE:

- Smallest hole per inside diameter
- Ideal plug removal tip profile



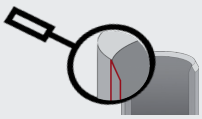
MIDDLE CUTTING EDGE:

- Longest blade life
- Most durable cutting edge



OUTSIDE CUTTING EDGE:

- Largest hole per outside diameter
- Ideal plug capture tip profile
- Ideal plug removal tip profile



SYNEO HOLLOW CORE SHARPENING TECHNOLOGY was developed in response to customer demands for sharp edges on tubular products with enhanced durability to weather rigorous use. Through 20+ years of research and experimentation, SYNEO's cutting edges are the sharpest, most-durable edge on any hollow core product in the world.

SPECIALTY MANUFACTURING

We provide quick-turn secondary component processing services and assembly services for catheter and guidewire applications, preserving our customer's precious internal resources for the most value-adding activities. efficiencies to your manufacturing process anytime during the product lifecycle.

We utilize in-house production equipment and tooling to perform manufacturing functions on a contract basis. Drawing on designs from our standard automation solution platform, we can process a wide range of medical-grade materials including single-lumen or multi-lumen tubing, wire-reinforced tubing, and nitinol wire. SYNEO offers custom short and long-run catheter manufacturing services and medical tubing assembly services

Services

Cut-to-Length	Hole Forming/Skiving
Tube Slitting	Tip Forming & Flaring
Printing & Laser Marking	Assembly

Grinding & Cutoff Technologies

Guidewire Grinding Solutions

Guiding catheters and other medical devices during cardiovascular and neurovascular procedures, guidewires require precision equipment. Glebar offers best-in-class guidewire grinding technology.

CAM.2 Micro Grinder

Glebar Micro Grinding Technology

The Glebar CAM.2 Micro Grinder is the perfect machine for grinding complex medical and small precision parts such as complex medical guidewires, radiuses, needle points, and non-linear shapes. Previously unproduceable parts can be made easily, with minimal setup time, and with limited operator training. Glebar's patented dual-carriage linear motor part feed system ensures that the position, speed, and rotation are under absolute control at all times controlling the grind with a high degree of diameter and length accuracy

Key Features

Software interface allows an unskilled operator to run multiple high-precision machines simultaneously.	Absolute control over the lengths and diameters.
Secondary Spindle Assembly can be used as a cutoff wheel to grind slots, angular slots, or generate sharp internal corners.	Available Spool Feeder System feeds Nitinol and SLT wire from a spool and cuts the wire to length.

GT-9AC Guidewire Grinder

Glebar Guidewire Grinding Technology

The Glebar GT-9AC Automated Guidewire Grinder excels at precision grinding of medical guidewires with multiple tapers, paddles, and parabolic shapes with speeds as fast as a centerless grinder. Instead of using sensors to detect the wire position and trigger diameter changes, high-speed imaging technology and a 1-micron encoder run the entire length of the feeder providing constant updates displayed on the touchscreen HMI allowing for quick, simple adjustments. The result is crisp, clear tapers and virtually no limit to the number of tapers, paddles, and parabolic shapes which can be ground.

Key Features

Software interface allows an unskilled operator to run multiple high-precision machines simultaneously.	Wire position is updated every 0.00025" (0.006 mm) at typical grinding speeds.
High-speed imaging technology and a 1-micron encoder run the length of the feeder.	Available Extractor allows for double-ended grinds or grinding multiple parts in the same cycle.

P4K Gauging System

Glebar Gauging Technology

The Glebar P4K Gauging System is the world's fastest and most accurate profile metrology system available for long parts or multiple short parts. It is the industry standard for measuring medical guidewires. It can scan multiple single parts or one long part in one operation. Inspectors simply clamp the part in the fixture and in one mouse click begin scanning. The simple user interface allows inspectors to quickly determine product quality on the manufacturing floor. Quality managers are provided with enough analysis data and traceability to comply with even the most stringent quality requirements. For companies with multiple facilities, the available SQL version connects to the intranet, centralizing data measurements and templates across plants.

Key Features

Results are presented to operators as a clear Go or No Go.	Provides a diameter and length reading every 30 millionths of an inch.
Fast scanning provides 10,000 readings per second.	Ability to set warning tolerances to alert the operator before a part goes out of tolerance.

Burr-Free Grinding & Cutoff for Medical Devices

Medical devices and tools such as biopsy needles, arthroscopic shavers and bone drills require burr-free finishes. Combining abrasive grinding and electrochemical erosion, Electrochemical Grinding (ECG) produces a more efficient, cost-effective, and burr-free part. Tridex Technology offers best-in-class ECG cutoff, grinding, and needle-pointing technology.

CS1-E ECG Cutoff

Tridex Burr-Free Cutoff Technology

The Tridex CS1-E Burr Free Electrochemical (ECG) Cutoff Machine features completely burr-free cutting virtually eliminating the need for deburring or other corrective secondary operations and reducing scrap. Almost all metals can be cut burr-free with ECG making it an attractive option for cutting medical tubing. Increasing efficiency, the CS1-E can cut multiple bars or tubes per cycle only limited by the part diameter.

Key Features

Completely burr-free cuts virtually eliminate the need for deburring and other secondary operations.	Cuts multiple tubes or bars per cycle.
Offered in right-or-left-hand configuration to create a work cell with one operator running two machines.	All feed components are protected from electrolyte and grit.

SG-1645 ECG Grinder

Tridex Burr-Free Grinding Technology

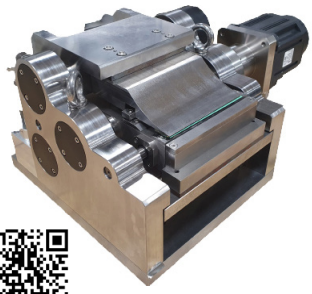
The Tridex SG-1645 Burr-Free Electrochemical NC/CNC Surface Grinder is a faster alternative to traditional surface grinding. By providing burr-free and low-force grinds that leave no heat-affected zones it virtually eliminates the need for deburring or other corrective secondary operations. The SG-1645 comes standard with conversational NC control with the option for Mistubishi CNC controls. For grinding points on wires or medical needles, the Tridex PGS-100 Point Grinding System can be easily integrated.

Key Features

Available Index Table Pallet Changer allows the operator to load the next part while grinding is in operation.	Standard simple conversational control with color HMI touchscreen. Full CNC is optional.
Robust stationary table design makes the machine easier to automate and provides more robust machine guarding.	Wheel moves in X, Y, and Z axes.

PGS-100 Needle Pointing

Tridex Burr-Free Needle Pointing Technology



The Tridex PGS-100 Burr-Free Electrochemical Point Grinding System is a fully programmable pointing and material handling system that easily integrates with the Tridex SG-1645 or SG-2060 ECG Grinders. Using ECG, the PGS-100 manufactures a wide variety of medical device points on tubing or solid wire, such as medical needles or K-wires. The PGS-100 is capable of handling a wide amount of work pieces providing high throughput for specialty pointing applications.

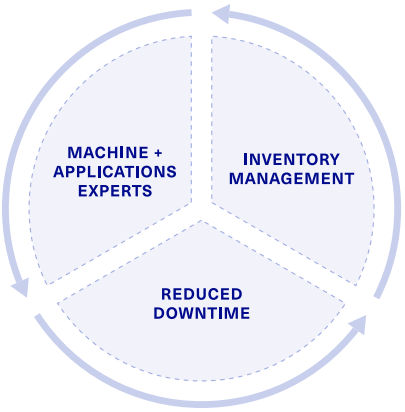
Key Features

Integrates with the Tridex SG-1645 and SG-2060 ECG Surface Grinders.	Setup and changeovers take minutes to complete.
Capable of producing Menghini, tri-bevel, back-bevel, trocar, diamond, stylet, Franseen, Chiba, Pencil Point, and other custom points.	No taping required for medical needles.

End-to-End Manufacturing Partner

totalcare
SUPPORT + SERVICE BY MMT

At MMT, we are committed to providing exceptional customer service and technical expertise to our customers. Our Total Care program is designed to help our customers reach their production goals across the manufacturing continuum.



	TOTAL CARE LOCAL	PREFERRED	TOTAL CARE	TOTAL CARE+
Customer Portal Access	●	●	●	●
24/7 Support Access			●	●
Flexible Monthly Technician Access*	●			
Training Time*		●	●	●
Reduced field Service Rates	●	●		
Free Field Service			●	●
Process/App Support	●	●	●	●
Annual System Eval - Health Check	●	●		
Bi-Annual System Eval- Health Check			●	●
Calibration	●	●	●	●
Periodic Maintenance	●	●	●	●
Facility Service Case Allowance	●	●		
Unlimited Service Cases			●	●
Local Critical Spares Access	●			
Inventory Management Options	●	●	●	●
No Charge Replacement Parts			●	●
Equipment Included				●

*Included

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