TE CONNECTIVITY (TE) EXPANDED ITS LASER CAPABILITIES THROUGH THE ACQUISITION OF LSA LASER. NOW JOINED TOGETHER, WE PROVIDE PRODUCT DEVELOPMENT AND MANUFACTURING SOLUTIONS TO OUR CUSTOMERS, OEMS AND OTHER CONTRACTORS IN THE MEDICAL DEVICE INDUSTRY. WE DEVELOP TECHNOLOGY AND APPLICATIONS THAT HAVE A BARRIER TO ENTRY BECAUSE OF COMPLEXITY OR COST. WE USE THESE TECHNOLOGIES TO SUPPORT OUR CUSTOMERS THROUGHOUT THEIR DESIGN, DEVELOPMENT AND PRODUCTION CYCLE.
**TE LASER CAPABILITIES**

### Medical Capabilities
- Guidewires
- Defibrillation Leads
- Surgical Instruments
- Tubular Devices
- Laparoscopic Instruments
- Catheter Subassemblies
- Catheter Porting
- Pacing Leads
- Endodontics
- Ophthalmology
- Feed-Throughs
- Stents
- Coil Termination
- Guide Catheters
- Drug Delivery Ports
- Fabric Cutting
- Many Others

### Material Capabilities
#### Metals
- Stainless Steels
- Platinum
- Platinum Alloys
- Nitinol
- Aluminum
- Copper
- Nickel
- Many others

#### Plastics
- Silicone
- PTFE
- ETFE
- Polyurethane
- PVAX
- PEBA
- PET
- PI
- Many others
COMMON WELD SYMBOLS PER ANSI/AWS

**Weld Symbol Configuration**

- **Leader (L):** Represents the direction from which the welder approaches the joint.
- **Basic weld symbol:** Indicates the type of weld (e.g., fillet weld).
- **Tail (T):** Represents the direction in which the welder leaves the joint.
- **Specifying number:** Denotes the number of welds or spots.
- **Size of spot or size of fillet:** Specifies the size of the weld or fillet.
- **Depth of penetration:** Indicates the depth to which the weld penetrates.
- **Fillet weld on other side of weld joint:** Shows weld on the reverse side.
- **Length and pitch of weld:** Specifies the length and spacing of the weld.

**Part as Welded**

- **Square groove weld all around OD:** Indicates a weld along the outer diameter.
- **.37" long Seam Weld:** Shows a weld along the seam.
- **.03" dia. spot welds equally spaced around OD:** Specifies equal spacing of spot welds.
- **Fillet weld on arrow side and other side of weld joint:** Shows welds on opposite sides.
- **Fillet weld all around OD:** Indicates a full circumferential weld.

**Part as Drawn**

- **Square Groove Weld:** Denotes a groove weld.
- **Spot Weld:** Shows a single weld.
- **Seam Weld:** Indicates a weld along the seam.
- **.03" dia. Spot Weld:** Specifies the diameter of the spot weld.
- **.37° Seam Weld:** Indicates the angle of the seam weld.
- **.37° LBW:** Shows a specific angle for LBW (Laser Beam Welding).

---

MEDICAL /// TE LASER ENGINEERING REFERENCE GUIDE
TE IS DEDICATED TO MAKING YOUR PROGRAMS SUCCESSFUL

Our engineering, manufacturing, and sales personnel are prepared with a variety of innovative solutions to meet your next challenge. We look forward to discussing and helping you to develop your applications.

Laser Welding

Good manufacturing practices and tight process controls are applied to all of our customers’ applications. No filler materials are added during the laser process which minimizes biocompatibility issues for medical submissions.

• Minimal heat-affected zone around weld site
• Fast, repeatable processes for consistent quality
• Contact free prevents stress on materials
• Dissimilar metals can be welded together
• Laser beam can be positioned into tight geometry

Laser Cutting

Our precision cutting of materials such as plastic or metal tubing is one of our strengths. Our knowledgeable sales personnel are available to discuss your next cutting application.

• Tolerances within 0.0005” or less
• Kerf width as small as 0.0007”
• Process small wall thicknesses as thin as 0.002” up to 0.030”
• Process diameter tubing (i.e. 0.012” x 0.009”)
• Fast, repeatable processes
• Processes generally cost less than machining or EDM methods

Laser Cutting/Ablation (Polymers)

• Requires little or no secondary cleaning processes
• Tolerances within 0.001” or less
• Drill holes as small as 0.002” or less
• OD reduction on polymer components and assemblies

ASSEMBLY

WE SAVE OUR CUSTOMERS TIME AND MONEY BY PERFORMING MEDICAL ASSEMBLY AND SUBASSEMBLY AT OUR FACILITY. OUR CONTROLLED ENVIRONMENT IS AVAILABLE TO APPLY OUR MANUFACTURING METHODS TO YOUR SPECIFIC PROGRAM NEEDS. OUR EXPERIENCED STAFF WILL PROVIDE AN INNOVATIVE, COST-EFFECTIVE SOLUTION TO YOUR ASSEMBLY REQUIREMENTS.
TE FEMTOSECOND LASER CAPABILITIES

Used for micromachining and allows single step laser processing of multiple materials in medical device applications.

- Good for cutting or drilling of multiple materials at one time (metal and polymer)
- Drill and cut micro shapes
- OD reduction on metal and polymer components and assemblies
- Materials and composites including polymers, platinum, stainless steel, nitinol and more
- Custom designed system for on or off axis work
- Used for R&D or volume applications
- Handles flat stock and tubular shapes on same system with minimal setup
- Cuts through all materials used to manufacture a catheter
- Galvo beam delivery for ultra-fast processing

TE FEMTOSECOND LASERS ARE ULTRAFAST LASER SYSTEMS WHICH ESSENTIALLY VAPORIZE MATTER WITHOUT CREATING A HEAT AFFECTED ZONE. THIS CAPABILITY CREATES NEW OPPORTUNITIES FOR ADVANCED MICRO DESIGNS, PARTICULARLY FOR DIFFICULT TO PROCESS METALS, DRILLING AND CUTTING HIGH-PRECISION HOLES AND SHAPES FREE FROM THERMAL DAMAGE. THESE RESULTS ARE NOT FEASIBLE WITH CONVENTIONAL LASERS.

To order product samples, please visit www.te.com/medical.
Equipment & Facility Overview

• 26,000 square feet housing medical device development processes
• Laser systems
• Testing equipment
• Finishing/Processing
• Inspection
• Machining/Toolmaking
TE’s MEDICAL GLOBAL SUPPORT

tecom/medical

USA/Canada: 1-866-251-3352
Mexico: 1-855-864-0621
Latin/South America: 54 11 4733 2200
Germany/Switzerland/Austria: 49 6151 607 1999
UK/Ireland: 49 896 089 184
Europe/Middle East/Africa: 44 800 267 666
China: 86 400 860 6670
Japan: 81 44 844 8041
Korea: 82 2 3415 4542
Singapore: 86 512 6255 4384