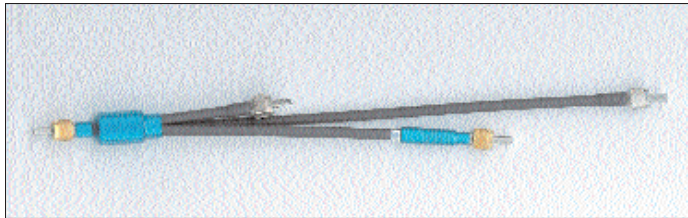


# Fiber Optic and Capillary Assemblies

- Low Fiber Count Assemblies
- Cable Design Options
- High Power Laser Connectors
- Bundles
- Capillary Assemblies

Assemblies consist of opto-mechanical and electro-optical components that incorporate standard products in combination with custom configured fused silica and precision optical products. Added optical or fluid features such as micro-machined end tips, metal terminations, or precision couplings can be included. Customer requirements and/or specifications help to determine whether standard products or custom designed optical and mechanical parts are required.



Assemblies can include optical, electrical, mechanical and fluid functions in a single, unit. Combining optical fibers, mechanical holding and mounting hardware and fused silica capillaries, they may be used to transfer and/or manipulate light

and/or fluids from one position to another. Most assemblies are based on specific user requirements. These can vary in complexity from a single, finished, optical fiber (with or without end-terminations) to a complex, branching assembly, combining the advantages of fused silica light guides and/or fluid guides, into an integral unit.

Optical fiber or fused silica capillaries can be clustered into bundles at one end and fanned-out into various configurations at the opposite end. Special end shapes can be micro-machined directly onto the optical fiber or capillary, saving bonding and coupling losses. Termination style and technique, jacketing, and fiber type can be specified to ensure optimum system performance.

Polymicro offers the system designer unparalleled flexibility to incorporate a wide range of design options into their assemblies. Some of the application areas are:

- |   |  |   |
|---|--|---|
| <p><b>Scientific</b></p> <ul style="list-style-type: none"> <li>○ Spectroscopy</li> <li>○ Remote Sensing (UV to IR)</li> <li>○ Calorimetry</li> <li>○ UV Epoxy Curing or Illumination</li> <li>○ Colorimetry</li> <li>○ Remote Illumination</li> <li>○ Temperature, Pressure Sensing</li> <li>○ Combined Optical and CE Arrays</li> <li>○ Custom GC Arrays</li> <li>○ Evanescent Wave Modification</li> </ul> | <p>&amp; Sensing</p> <p><b>Industrial</b></p> <ul style="list-style-type: none"> <li>○ Process Control</li> <li>○ Remote Sensing</li> <li>○ UV Epoxy Curing</li> <li>○ Remote Illumination</li> <li>○ Illumination-reflection Sensing</li> <li>○ Smoke and Particle Detection</li> <li>○ Materials Monitoring</li> <li>○ Quality Monitoring</li> </ul> | <p><b>Medical*</b></p> <ul style="list-style-type: none"> <li>○ Tissue Ablation - Cauterization</li> <li>○ Photodynamic Therapy</li> <li>○ Angioplasty</li> <li>○ Ophthalmology</li> <li>○ Dental</li> <li>○ Cosmetic Procedures</li> <li>○ Illumination</li> <li>○ Endoscopic Applications</li> <li>○ Diagnostic &amp; Gas Sensing</li> <li>○ TMR</li> </ul> |
|---|--|---|

\* Polymicro Technologies manufactures optical fiber cable, components and assemblies only. Polymicro Technologies does not design, manufacture or market any medical devices.



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- Flexible Capillary
- Multimode Optical Fiber
- Specialty Assemblies
- Micro-Components

# Fiber Optic and Capillary Assemblies

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Our extensive medical, industrial, scientific experience is a valuable resource in designing and building fiber optic assemblies for applications ranging from laser power transmission to process control instrumentation to short distance data communication. In order to do our best for you, we will need answers to as many of the following items as is possible.

- Application Description
- Wavelength(s) of Operation
- Input Source Types (diode, laser, broadband, CW, pulsed)
- Power Levels (peak, pulse, rate, repetitions, energy density)
- Length, with Tolerances
- Environmental, Chemical, Use Conditions
- Level of Reliability
- Launch Conditions (spot size, input NA)
- Bio-compatibility or Sterilization Required\*
- Flexibility Requirements
- Sketches and Concept Drawings
- Configuration (straight or multi-leg)
- Input/Output Functions (sensing, power delivery, diffusion, etc)
- Size Constraints of Fiber, Bundle, Jacket, and Assembly
- Bending Diameter(s) and Locations
- Temperature Range (operation, storage, intermittent)
- Cost Guidelines and Targets
- Flammability
- Test Requirements
- Quantity & Delivery Requirements (prototype and production)

\* The end manufacturer is responsible for bio-compatibility and sterilization testing and validation studies.

In response to the details of the above design parameters, our engineers will be able to take your requirements and help you generate an initial design solution. Before any design is finalized, the following items will generally have to be specified. This helps to generate performance, cost and test requirements. It will become the definitive guide when production of the assemblies begins.

- Fiber or Capillary Type
- Fiber Size (core, clad, buffer)
- Proof Test Level
- Overall Assembly Size
- Termination Type (SMA, ST, shaped, other)
- End Finish (polish, cleave, lens)
- Achievable Tolerances
- Numerical Aperture (NA) of fiber
- Shaped End-tips
- Insertion Loss
- Fiber Anchoring (epoxy, crimp, other)
- Jacket, Buffer, Strength Member Materials
- Test Requirements
- Bend Diameters (loss budget, short-term & long-term minimums)



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