



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. This holds true also for capillary assemblies and arrays. 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.

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

Scientific

- Spectroscopy
- Remote Sensing (UV to IR)
- Calorimetry
- UV Epoxy Curing or Illumination
- Colorimetry
- Remote Illumination
- Temperature, Pressure Sensing
- Combined Optical and CE Arrays
- Custom GC assemblies
- Evanescent Wave Modification and Sensing

Industrial

- Process Control
- Remote Sensing
- UV Epoxy Curing
- Remote Illumination
- Illumination-Reflection Sensing
- Smoke and Particle Detection
- Materials Monitoring
- Quality Monitoring

Medical*

- Tissue Ablation - Cauterization
- Photodynamic Therapy
- Angioplasty
- Ophthalmology
- Dental
- Cosmetic Procedures
- Illumination
- Endoscopic Applications
- Diagnostic and Gas Sensing
- TMR

**Polymicro Fiber
 Optic and Capillary
 Assemblies**



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

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	Sketches and concept drawings
Wavelength(s) of operation	Configuration (straight or multileg)
Input Source Types (diode, laser, broadband, CW, pulsed)	Input/output functions (sensing, power delivery, diffusion, etc)
Power levels (peak, pulse, rate, repetitions, energy density)	Size constraints of fiber, bundle, jacket, and assembly
Length, with tolerances	Bending diameter(s) and locations
Environmental, chemical, use conditions	Temperature range (operation, storage, intermittent)
Level of reliability	Cost guidelines and targets
Launch conditions (spot size, input NA)	Flammability
Bio-compatibility or sterilization requirements*	Test requirements
Flexibility requirements	Quantity and delivery requirements (prototype and production)

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	Numerical aperture (NA) of fiber
Fiber size (core, clad, buffer)	Shaped end-tips
Proof test level	Insertion loss
Overall assembly size	Fiber anchoring (epoxy, crimp, other)
Termination type (SMA, ST, shaped, other)	Jacket, buffer, strength member materials
End finish (polish, cleave, lens)	Test requirements
Achievable tolerances	Bend diameters (loss budget, short-term and longterm minimums)

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

