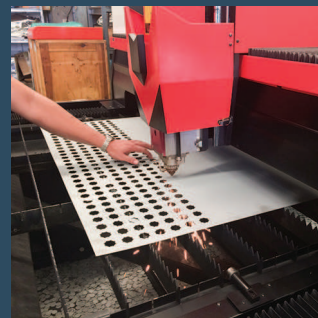
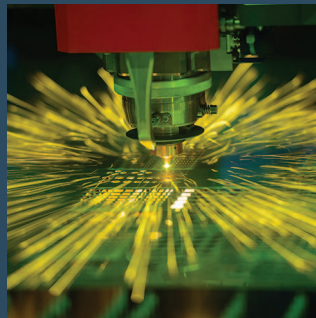
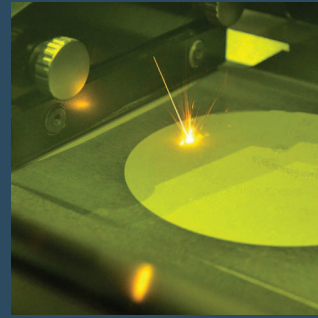
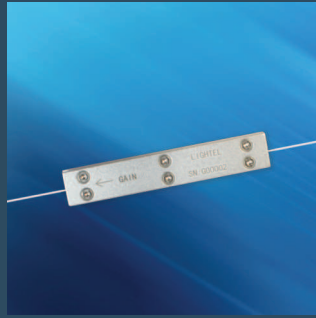
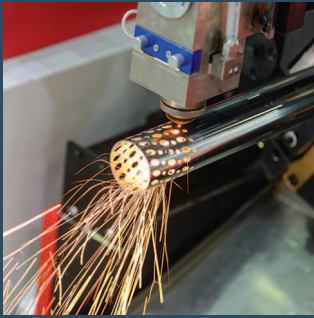


High Power

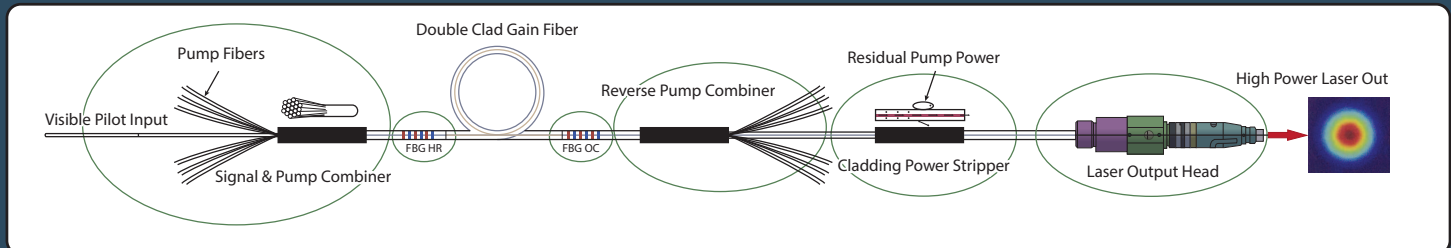
Fiber Optic Components



LIGHTTEL

High Power Fiber Optic Components

High power fiber optic systems are experiencing rapid growth due to their many applications in the material processing, medical and defense industries. Fiber lasers are especially becoming more popular due to their versatility, precision control, superior performance and low maintenance costs when compared to other laser systems. Lightel offers a wide variety of superior quality, high power fiber optic components for your system needs.

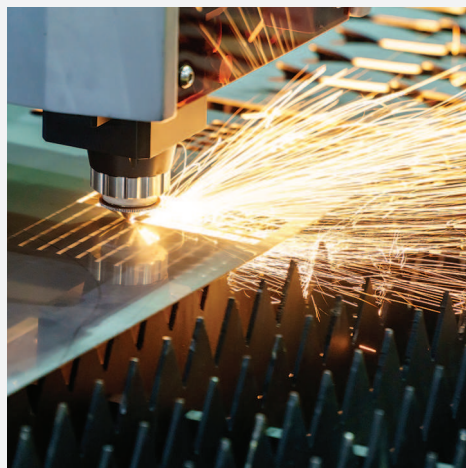


Components of a Fiber Laser

Pump and Signal Combiners

Lightel's pump combiners can be used to combine several pump lasers. Our patented bundling technology significantly increases the combiner's reliability. Manufactured using our proprietary methods, Lightel's combiners are available with up to N=37 and other custom configurations handling as much as 10kW total power. In addition, Lightel offers specialty combiners with extended wavelength, active combiners and polarization maintaining combiners.

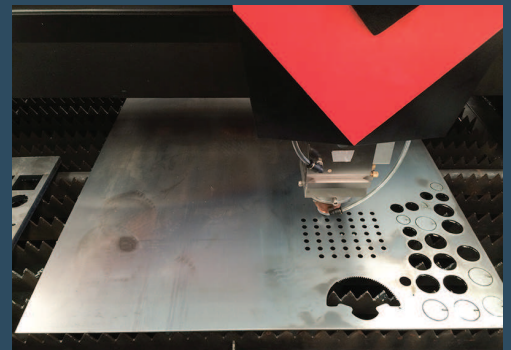
- N×1 High Power Pump Combiners
- (N+1)×1 High Power Pump and Signal Combiners
- (1+1)×1 or (2+1)×1 High Power Side Pump and Signal Combiners
- (N+1)×1 PM Pump Combiners
- 2000nm High Power Pump and Signal Combiners
- (N+1)×1 High Power Reverse Pump Combiner
- Active (2+1)×1 Combiner
- High Power Laser Combiners
- High Temperature/Harsh Environment Combiners



High Power Fiber Bragg Grating Mirrors

Fiber Bragg Grating (FBG) mirrors in a fiber laser system are distributed reflectors fabricated in an optical fiber that permit the reflection of particular wavelengths and the transmission of the remainder. FBG mirrors can be utilized as a high reflector (HR) and low reflectivity output coupler (OC) to produce a laser cavity in a fiber laser.

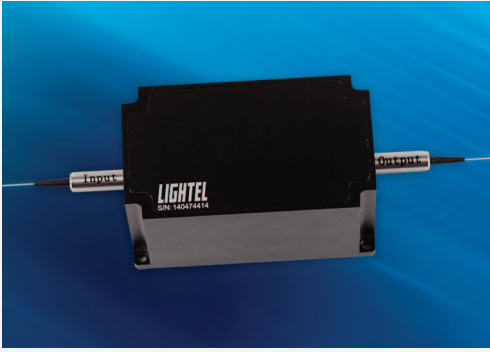
Lightel's FBG mirrors have been optimized to address the requirements of low noise and high efficiency fiber laser applications. Lightel's FBG mirrors feature low thermal slope, precise wavelength matching with a wide reflectivity and bandwidth range. Our process also allows us to fabricate FBG mirrors on a large variety of standard, custom or harsh environment fibers. Lightel's FBG mirrors can be delivered in our high-power thermal dissipative package (also provides mechanical and shock protection and reduced wavelength drift) or simply re-coated with a rugged low index polymer.



High Power Fused Devices

High power fiber laser and amplifier systems often require additional fused devices. For example, Mode Field Adapters (MFA) can be used to connect two fibers with different core diameters and numerical apertures (NA). Lightel's MFAs utilize mode field optimization technology to obtain high transfer efficiency and low beam degradation. Also, Cladding Power Strippers (CPS) are utilized to strip unwanted cladding light from dual clad fiber (DCF). Fiber End-Caps (FEC) are used to reduce the power density at the output of the fiber facet. A mode stripper is incorporated into all Lightel FECs to strip unwanted back-reflected light from the cladding.

- Mode Field Adapter (PM or Non-PM)
- Cladding Power Strippers
- Fiber End Cap (PM or Non-PM)
- High Power Couplers/WDMs
- High Temperature/Harsh Environment Fused Devices



High Power Micro-Optic Devices

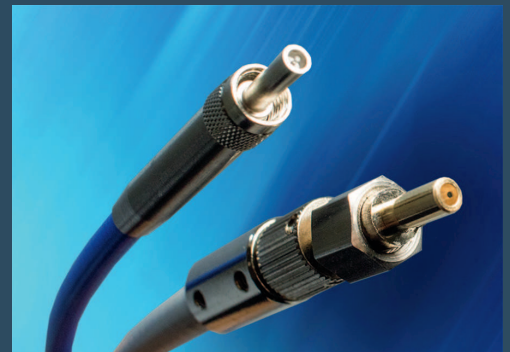
Some high power fiber optic systems need specialized micro-optic components to reduce backreflection and protect the pump and signal lasers. High power signals may also need to be split and combined depending upon their polarization or wavelength. Lightel offers a variety of high power micro-optic fiber optic components to satisfy even the most demanding performance requirements.

- High Power Polarization Beam Splitter/Combiner
- High Power Single and Dual Stage Isolator
- High Power 3-Port Polarization Insensitive Circulator
- High Power Filter Devices
- Pump Laser Protector
- High Temperature Micro-optic Devices

High Power Laser Delivery Head

Lightel also offers several industry-standard laser head delivery systems depending on beam power level. Our QBH-style laser head has an integral quartz block and mode stripper, allowing it to handle high optical power. The internally water-cooled connector provides low signal loss and beam quality degradation, and is equipped with a safety interlock. In addition, Lightel supplies cable assemblies equipped with SMA or D80 connectors for medium power laser delivery in medical and industrial applications.

- QBH-style Cable Assemblies
- SMA Cable Assemblies
- D80 Cable Assemblies



About Lightel

LIGHTTEL designs, develops, and manufactures a broad range of products and services for the high power fiber optic industry worldwide. Our product line includes passive optical components (such as high power end and side pump combiners, couplers, isolators, circulators, filters and WDMs), video inspection scopes (supporting large core fiber up to 1000 microns) and workstations to manufacture high power components.