

CARBON MONOXIDE (CO) LASER OPTICS

5-6 μ m(CO) Laser Optics and Assemblies

Coherent, the world leader in laser optics, is now extending its product line to include optics and components for carbon monoxide (CO) lasers. Our complete line of CO laser optics will provide laser systems builders the tools they need to incorporate

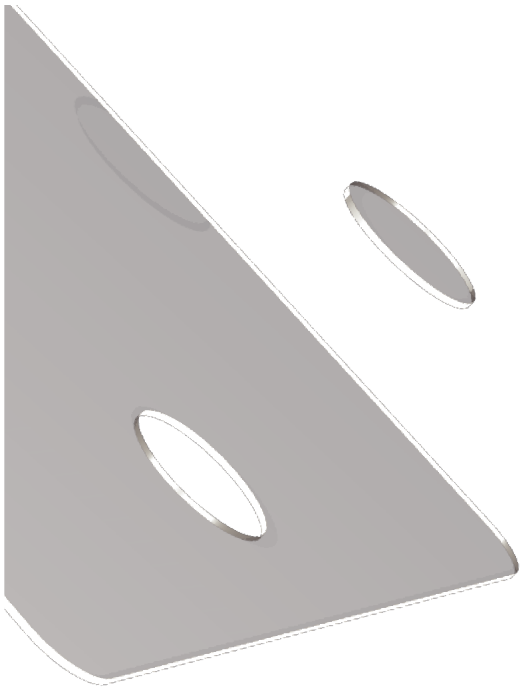
this new technology into their manufacturing platforms. The new CO laser is now being used in materials processing applications such as PCB drilling and the cutting of glass, ceramics, and thin films. CO lasers also have potential applications for the medical field and aesthetic procedures. The CO line is a great complement to our existing CO₂ optical products which already serve the industrial, medical, and semiconductor industries.



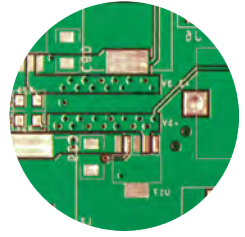
CAPABILITIES

- Highest quality transmissive optical materials available- ZnSe, ZnS(MS), and Ge
- 4 - 250 mm diameter optics
- Custom optical designs (e.g. aspheres, axicons, spherical, free form lenses, etc.) available upon request
- Custom coating designs to meet specific customer requirements
- Optical assemblies such as beam expanders, multi-element scanning lenses, and cutting heads
- Ability to coat all reflective materials for beam delivery, galvo, and resonator mirrors (e.g. Copper, Si, Aluminum, etc).

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Glass Cutting



via Hole Drilling



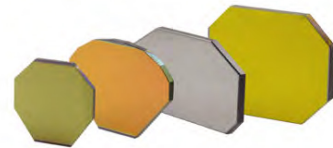
Medical



Marking & Engraving



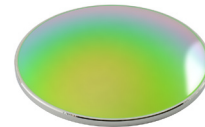
Scan Lenses



Galvo Mirrors



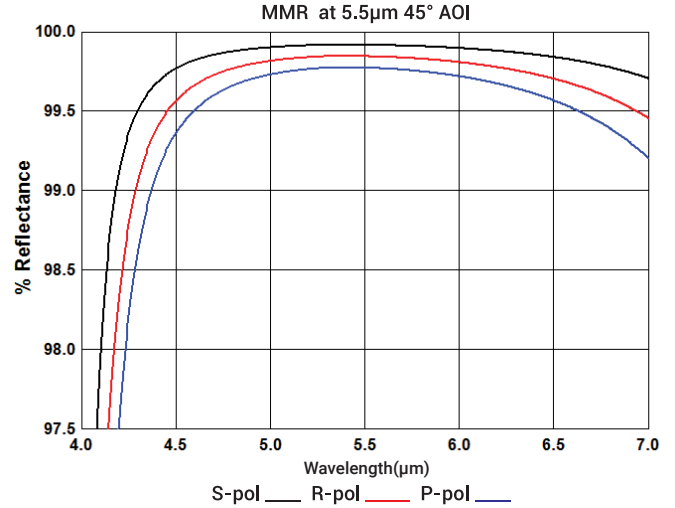
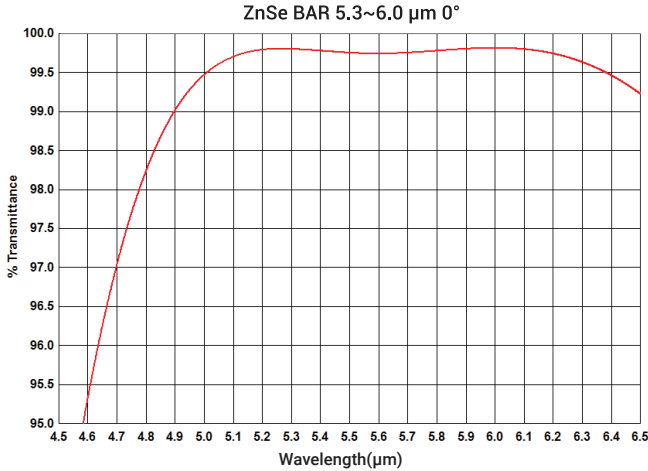
Beam Expanders



Lenses

5-6 μm Coatings

Coherent has developed a full suite of coatings covering Anti-Reflective coatings, Reflective coatings, BandSelective resonator coatings, Beam Splitter, and Polarization coatings. These coatings were developed with the multiple lasing lines of the CO laser in mind. These coatings are broadband in the 5μm - 6μm range to cover the CO spectrum.



5-6μm Scanning Optics

Coherent is also the only source for a complete line of 5 - 6μm scanning optics. From galvo mirrors for beam steering to beam expanders for beam shaping, Coherent can provide a complete set of optics for your scanning system. Coherent can also provide single element and multi-element scanning lenses for all laser machining applications. For high performance systems, like via-hole drilling applications, Coherent can custom design and manufacture lenses to meet all of the most demanding requirements.

Material Properties

Optical Properties	ZnSe	ZnS(MS)	Ge
Bulk Abs@ 5.5μm	0.0004/cm	0.005/cm	0.005/cm
Temp Change of Refractive Index@ 3.39 μm	62x10 ⁻⁶ /°C	39x10 ⁻⁶ /°C	396x10 ⁻⁶ /°C
Mechanical Properties			
Density	5.27 g/cm ³	4.09 g/cm ³	5.32 g/cm ³
Young's Modulus	67.2 Gpa	85.5 Gpa	100 Gpa
Knoop Hardness	105-120 kg/mm ³	150-165 kg/mm ³	692 kg/mm ³
Thermal Properties			
Thermal Conductivity@ 20°C	0.18 W/cm/°C	0.27 W/cm/°C	0.59 W/cm/°C
Thermal Expansion @ 20°C	7.57x10 ⁻⁵ /°C	6.5x10 ⁻⁵ /°C	5.7x10 ⁻⁵ /°C