New UltraMaxR Hard Coat Mirrors For CO_2 Lasers

LOM's UltraMaxR mirrors offer the highest reflectivity and lowest absorption for demanding CO_2 application lasers up to 10kW. Our advanced "green technology" coatings are more abrasion (scratch) resistant and durable compared with standard Zinc Selenide (TRZ etc.) based coatings making it easier to manage contamination buildup and maximize optic life. All this translates to better productive, system performance, reliability and lower cost of operating the laser. The UltraMaxR coating offer better resistance to intra-cavity (resonator) ultraviolet light and ion bombardment making it suitable for high power resonators as well as external beam delivery applications. UltraMaxR mirrors help reduce power loss and deliver maximum power for laser cutting. Coatings are available on water cooled copper, standard copper and silicon mirrors. The mirrors are available in various sizes to meet your requirements.

Coating Specification:

Reflection: 45º AOI (Angle of Incidence)
R >99.9% s-pol, R >99.70% p-pol; R >99.85% Average Reflectivity at 10.6µm
R >45% for 633nm - standard coating (UMR). Suitable for intra-cavity application and external application when high visible diode reflectivity is not required.
R >75% for 633nm - enhanced (UMRE) coating. Suitable for most applications.

Absorption: Absorption at 10.6µm <0.2 at 45º AOI

Phase Shift: Zero Phase < 2º @ 45º AOI

Environmental: Adhesion - Tape test
Mil-C-48497A Humidity - 24hrs, 49°C, 95-100% relative humidity
Abrasion - Severe, 20 strokes eraser rub test

Mirror Specifications (Assumes Suitable Aspect Ratio):

Figure: Plano, Convex or Concave Surfaces
Base Materials: Copper and Silicon
Diameter: 5mm to 150mm , +0 / - 0.12 mm
Thickness: 1mm to 50mm , +0 / - 0.12 mm
Flatness: λ/20 Power, λ/40 Irregularity 10.6µm
Parallelism: <3 arc min
Surface Quality: <5nm RMS Super Polish or <30nmRMS Diamond Turned, Coating 40-20 Scratch-Dig

Progressive Power Loss Comparison - UltraMaxR vs. Standard Coatings:

- A typical 4kW laser system with 10 bends mirrors

Bend Mirror*	BM1	BM2	BM3	BM4	BM5	BM6	BM7	BM8	BM9	BM10	Total Power Loss
Power Loss (Watts) -Standard Mirror with 99.5% Reflectivity @ 45 deg AOI	20	40	60	79	99	119	138	157	176	196	200 Watts or ~5% (Standard)
Power Loss (Watts) UltraMaxR with 99.9% Refelectivity @ 45 deg AOI	4	8	12	16	20	24	28	32	36	40	40Watts or ~1% (UltraMaxR)

Zero degree and 90^0 (retro-retarder) mirrors available for Amada®, Cincinnati®, Bystronic®, Mazak®, Mitsubishi®, Trumpf®, LVD®, HanKwang & Other Laser Cuttings Systems.

Maximize Performance From Laser Machines

Laser Optics and Mechanisms

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