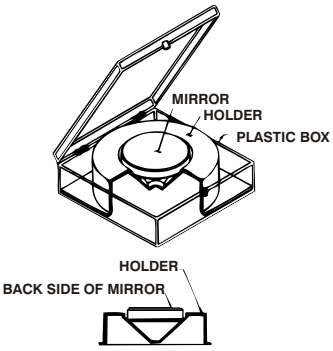
MOLYBDENUM MIRRORS

PRODUCT SHEET

Moly mirrors have long been used with high power CO_2 gas dynamic lasers. Advanced polishing techniques are required to polish bare molybdenum metal to a reflectivity of 98% at the CO_2 10.6 μ wavelength. When this is accomplished the resulting mirror has superb physical properties. It is resistant to cleaning induced scratches and can be used in dirty environments. When dust particles settle on a moly mirror they do not tend to get burned-in or damage as occurs with superficial enhanced metal coatings. Moly mirrors also have low thermal distortion and the highest CO_2 CW laser damage threshold for any materials tested.[1] As an option, SPAWR offers a broadband high reflectance coating allowing these mirrors to be used with a variety of wavelengths. A protective shipping/storage container is provided with each mirror.



Typical shipping/storage container for 1" to 2" diameter mirrors

Description	Laboratory Grade	Industrial Grade
Reflectivity	98% @ 10.6 μ	98% @ 10.6 μ
Surface Accuracy	λ/20 @ 10.6 μ	λ/10 @ 10.6 μ
Surface Smoothness	40Å RMS	45Å RMS
Scratch/Dig	40/20	60/40
Expansion Coefficient	$3x10^{-6}$/ °F	$3x10^{-6}$/ °F
Damage Threshold CW [1]	200 KW/cm^2 for 8 sec. For small (<0.015") spot diameter	150 KW/cm^2 for 8 sec. For small (<0.015") spot diameter
Damage Threshold Pulsed [1]	$2x10^5$ J/cm^2 $\sqrt{\text{sec}}$ over full clear aperture	$1x10^5$ J/cm^2 $\sqrt{\text{sec}}$ over full clear aperture

[1] SPAWR , Tech Report No. 74-004, "Metal Mirror Selection Guide"

SPAWR offers high durability molybdenum mirrors for use with CO_2 lasers. These uncoated moly mirrors are the best all-around choice for industrial applications at 10.6 microns.

Thermal Conductivity: 1.33 W/cmC Melt Temperature: 2640C (4750F)

Laboratory Grade Catalog No.	Industrial Grade Catalog No.	Outside Diameter (mm)	Outside Diameter (inches)	Thickness (mm)	Thickness (inches)	Approximate Weight
LMo-001	IMo-001	25.4	1	6.4	0.25	1 oz.
LMo-015	IMo-015	38.1	1.5	6.4	0.25	3 oz.
LMo-021	IMo-021	50.8	2	9.7	0.38	7 oz.
LMo-041	IMo-041	76.2	3	12.7	0.50	1.2 lb.
LMo-061	IMo-061	101.6	4	19.0	0.75	3.5 lb.

GENERAL INFORMATION:

- SPAWR is a major supplier of state-of-the-art metal mirrors for use in very high power laser research. The highest quality metal mirrors, which have provided the highest CO_2 laser damage threshold, are produced by SPAWR.
- Optical characteristics are for 80% of the diameter of the mirror, and λ = 10.6 μ"Digs less then 5 micrometers in diameter shall be ignored.
- Standard radii are concave and include 1M, 5M, 10M and 20M, for up to 4" Diameter.
- Mirrors larger than 4" diameter, including custom mirrors, will be quoted on request.
- A protective shipping/storage container is provided with each mirror.

Questions and comments to spawr@spawrindustries.com. Or visit www.spawrindustries.com.
SPAWR Industries, Inc. 2051 Spawr Circle, Lake Havasu City, AZ 86403
PHONE(928) 453-8800 FAX (928) 453-8811