

PRODUCT SHEET



LCuW water-cooled mirrors are designed to accept CW laser beams of 3 KW/cm² with $\lambda/20$ thermal distortion at 10.6 micrometers.

The mirrors are comprised of a high efficiency heat exchanger in intimate contact with a very thin mirror faceplate. The heat exchanger controls laser induced thermal gradients in the mirror surface. The mirror will not become excessively distorted and introduce optical aberrations into the reflected laser beam. If high beam quality is to be produced in the laser cavity, and maintained in the far field, mirrors of this type must be used when the incident power density exceeds 200 watts/cm²

Description	Laboratory Grade
Reflectivity	99% @ $\geq 2.7 \mu$
Surface Accuracy	$\lambda/20$
Surface Smoothness	30Å RMS
Scratch/Dig	40/20
Damage Threshold	> 120 KW/cm ² CW
Material	High Purity Copper
Thermal Distortion:	$\lambda/20$ ($\lambda/10$ total surface figure at 3 KW/cm ² incident)*

These mirrors are available with a hard gold coating to protect the surfaces from harsh chemical environments, and an alternate coating to retain >0.985 reflectance down to 0.5 micrometers.

* Optical specifications for $\lambda = 10.6$ micrometers. Physical characteristics apply to a clear aperture of 80% of the outside diameter.

Laboratory Grade Catalog No.	Outside Diameter		Standard Radii (Concave)
	(mm)	(inches)	
LCuW-021	50.8	2	1M, 5M, 10M, 20M
LCuW-041	76.2	3	1M, 5M, 10M, 20M
LCuW-061	101.6	4	1M, 5M, 10M, 20M
LCuW-081	127.0	5	1M, 5M, 10M, 20M
LCuW-101	152.4	6	1M, 5M, 10M, 20M
The standard parameters for the following larger mirrors are $\lambda/5$ surface accuracy and $\lambda/5$ thermal distortion at 10.6 μ , 25-40Å RMS and 60/40 Scratch and Dig			
LCuW-121	203.2	8	Flat
LCuW-141	254.0	10	Flat
LCuW-161	304.8	12	Flat
LCuW-201	406.4	16	Flat

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 CO₂ laser damage threshold, are produced by SPAWR.
- Standard coupling mirrors, calorimeter mirrors and additional data on request.
- Other diameters, radii, custom designs and higher performance mirrors are common and available on separate quote.
- A protective shipping/storage container is provided with each mirror.