



High Power Laser Scanning Mirror

PROFESSIONAL MANUFACTURER OF LASER CRYSTALS, LASER OPTICS AND LASER DEVICES

High Power Laser Scanning Mirror

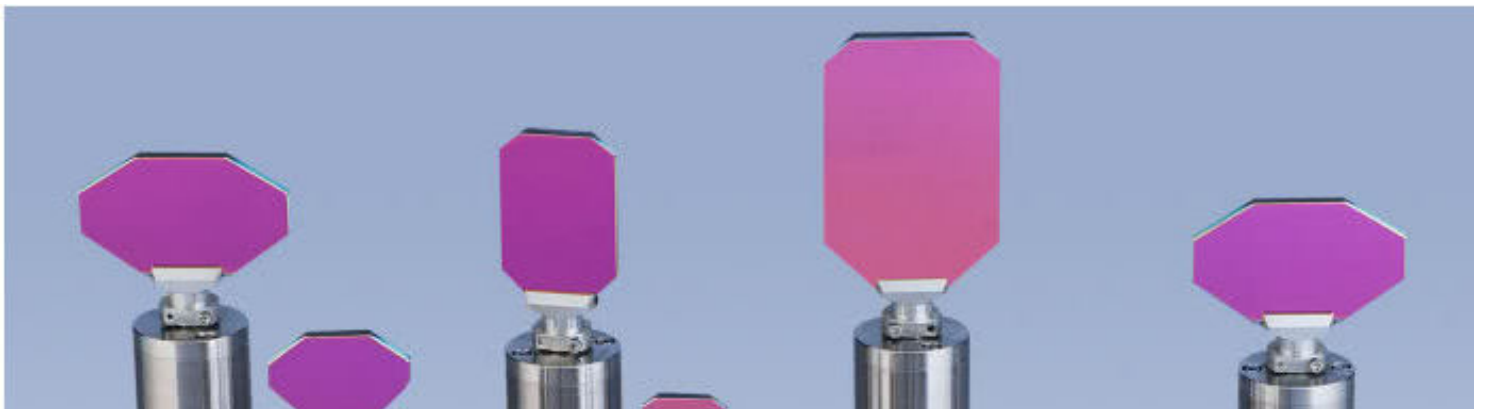
CRYLINK provides various types of high power X/Y scanning mirror, mainly including silicon scanning mirror and quartz scanning mirror, for laser scanning mirror systems above 6Kw. Laser wavelengths include 355nm, 532nm, 1064nm and 10.6μm.

CRYLINK's laser scanning mirror products have high quality polished substrates, low residual stress in the film layer of the lens after coating, and good surface shape.

Thanks to the special coating technology, it is possible to ensure that the mirror dissipate heat quickly and with little temperature rise at the laser focus during use. The amount of change in the shape of the used surface is very small. The mirror have a high threshold of laser damage, which can meet the requirements of long-term stable use of the scanning mirror.

X/Y Scanning Mirror

Incident Beam Diameter (mm)	Laser	Incidence Angle	Substrate Material	Damage Threshold	Reflectance
8、10、12、15、20	10.6μm	37.5° ± 12.5° 45°±12.5°	Si	500W	HR: R>99.5%@10.6um HR: R>85%@650nm
	1064nm		Si、FS	>50J/cm2	HR: R>99.5%@1064nm HR: R>85%@650nm
	532nm		FS	>10J/cm2	HR: R>99.5%@532nm HR: R>85%@650nm
	355nm		FS	>5J/cm2	HR: R>99.5%@355nm HR: R>85%@650nm
	Fiber Laser 1030-1090nm		Si、FS	>50J/cm2	HR: R>99.5%@1030-1090nm HR: R>85%@650nm



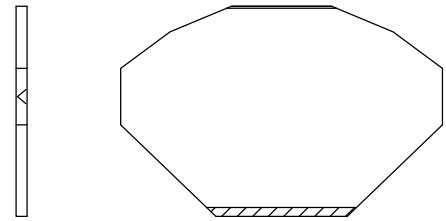
Case

****Company (confidential)**

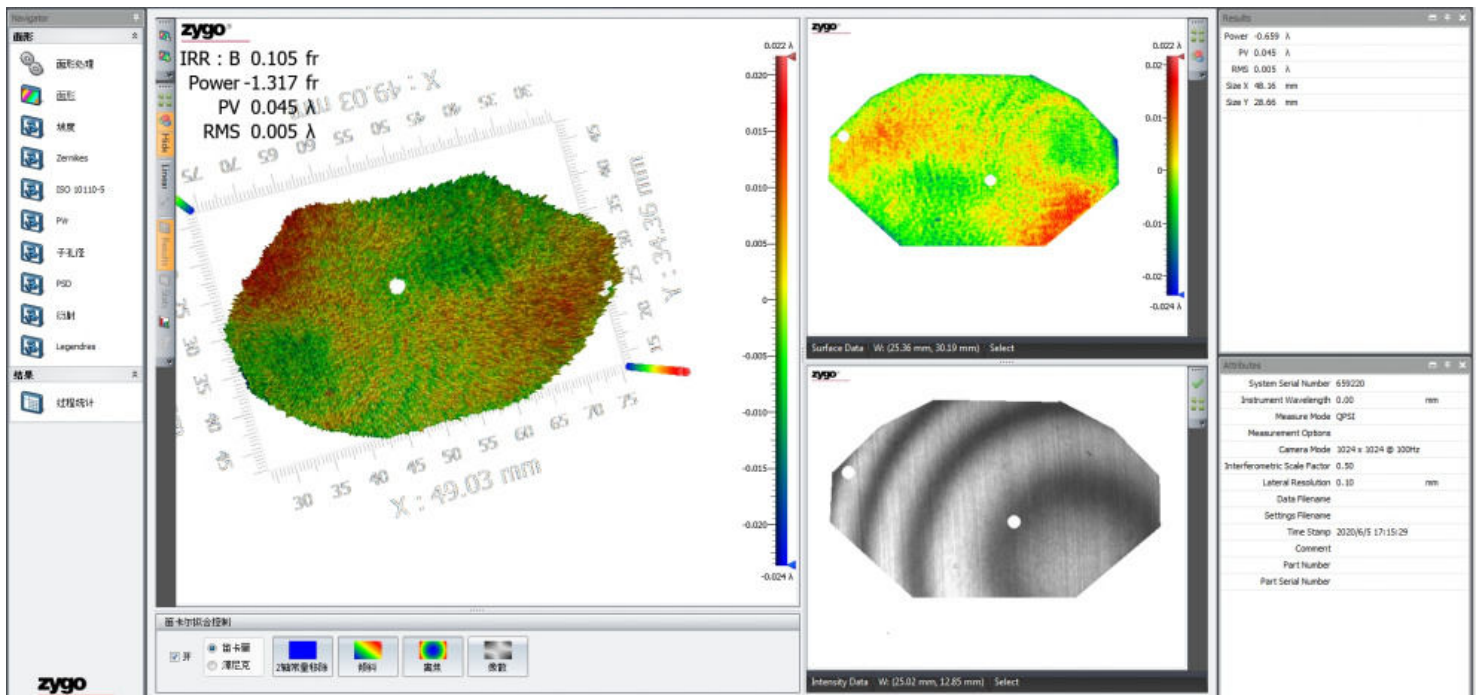
High power 1064nm laser oscillator, laser power requirement >6000W

1) Quality control of mirror polishing

	Polished substrates	Coated Mirror
	S1	S1
Radius Deviation Power	0.8 λ	1 λ
Astigmatism Deviation PV	0.15 λ	0.25 λ
Local Deviation PV	0.2 λ	0.35 λ
Parallelism	100"	100"
Surface Quality	20/10	40/20
Surface Roughness	<4 μm	<4 μm
Optical Aperture	100%Polished surface	97%Coating area
Chipping	<0.1 mm	<0.1 mm

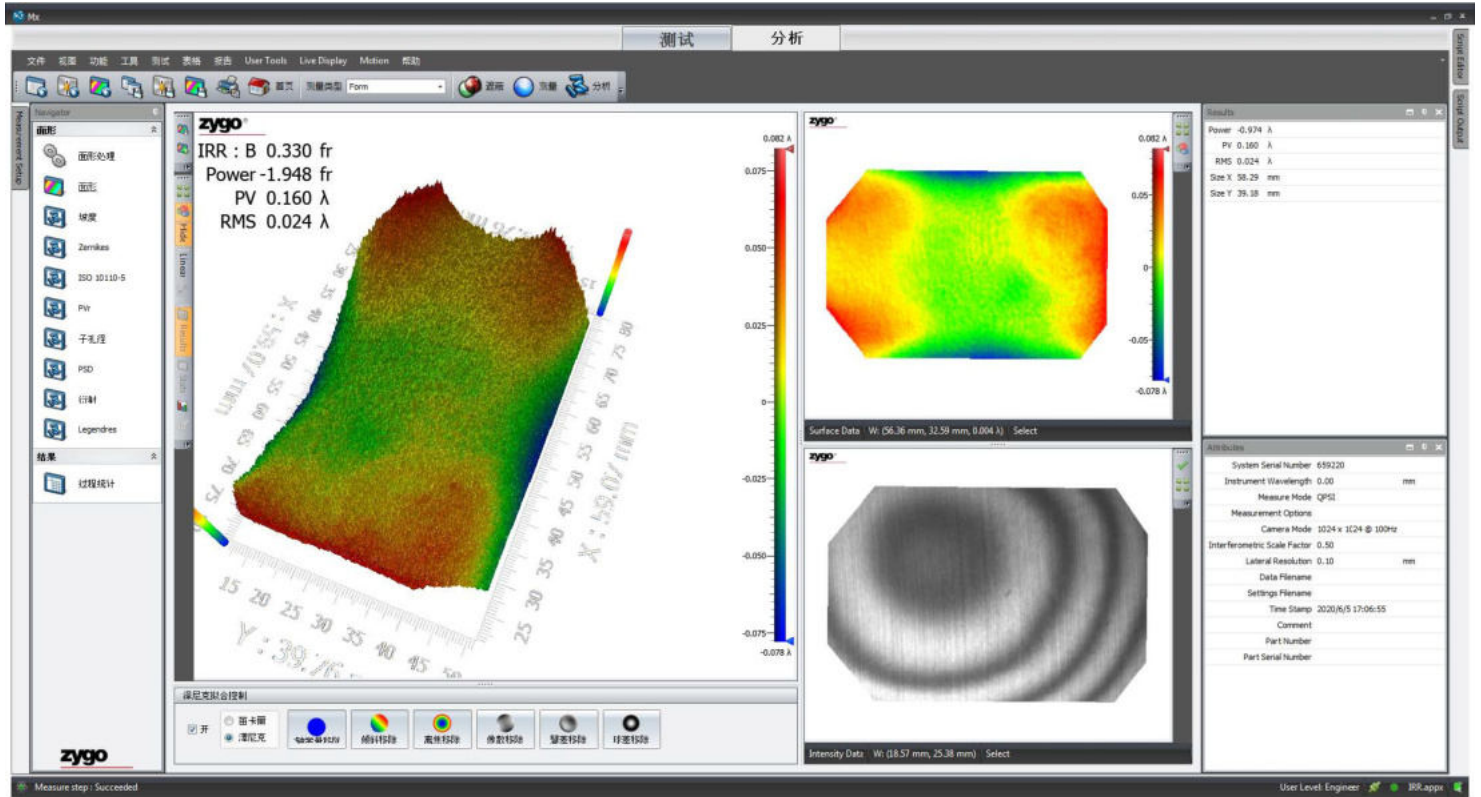


2) Surface shape control after substrate coating

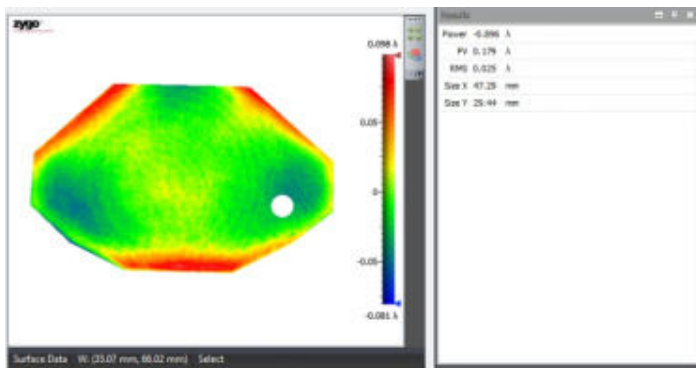


X-Mirror Surface shape

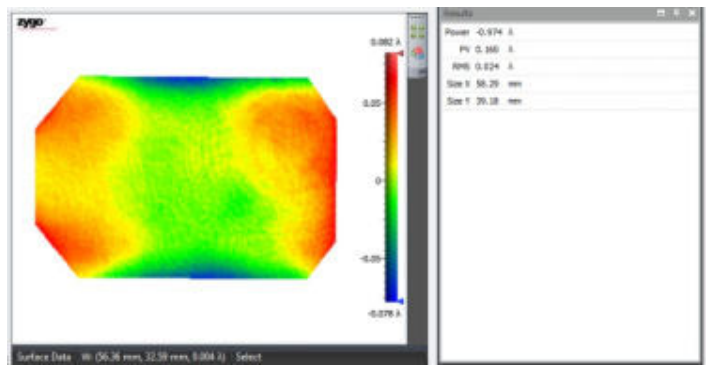




Y-Mirror Surface shape



X-Mirror Surface shape

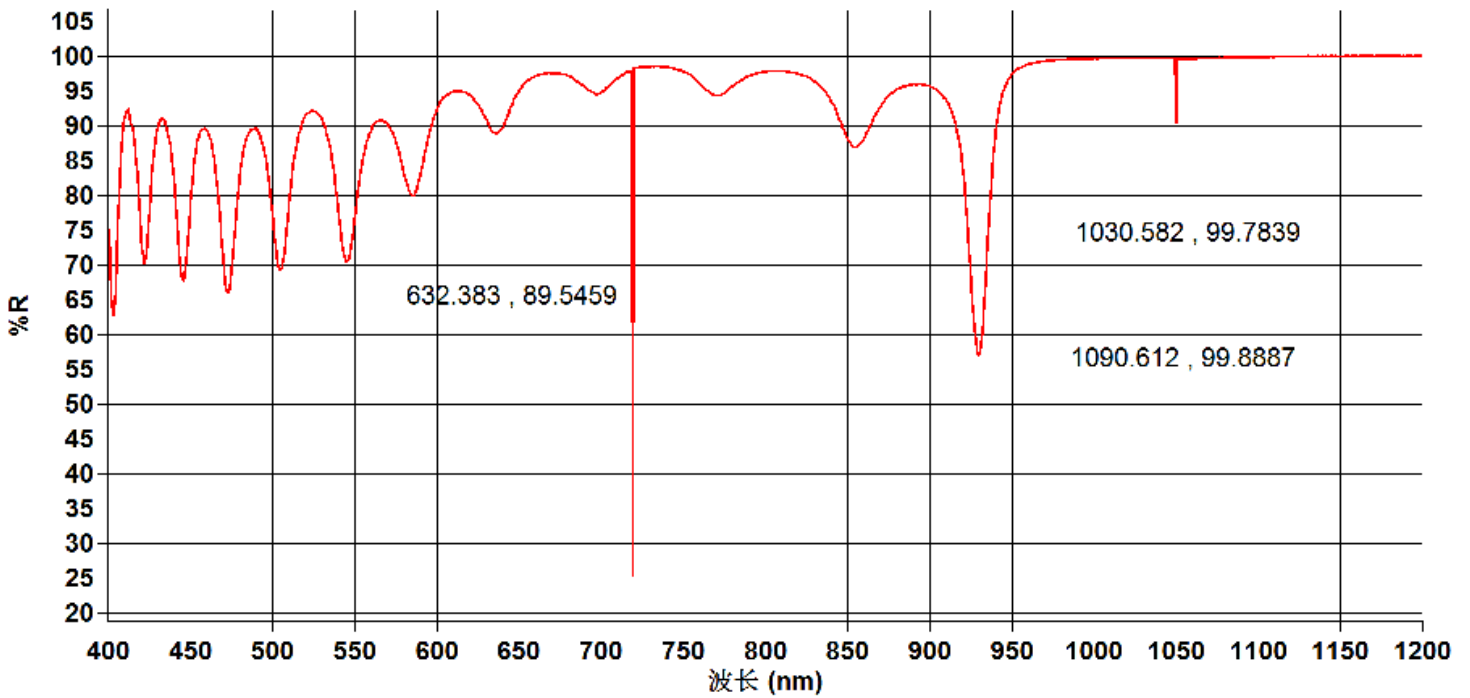


Y-Mirror Surface shape

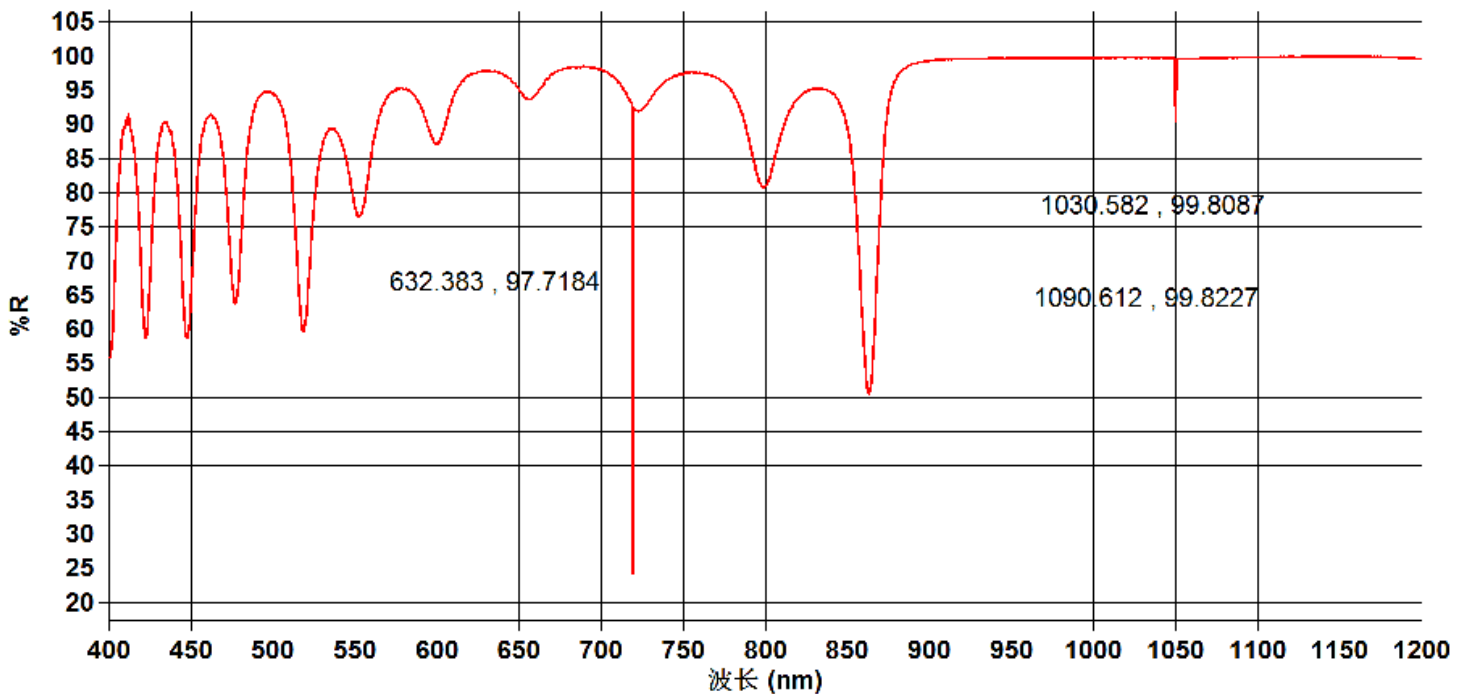


3) Reflectance curve after substrate coating

R@22.5°



R@45°



Product Advantages

1) High quality substrate

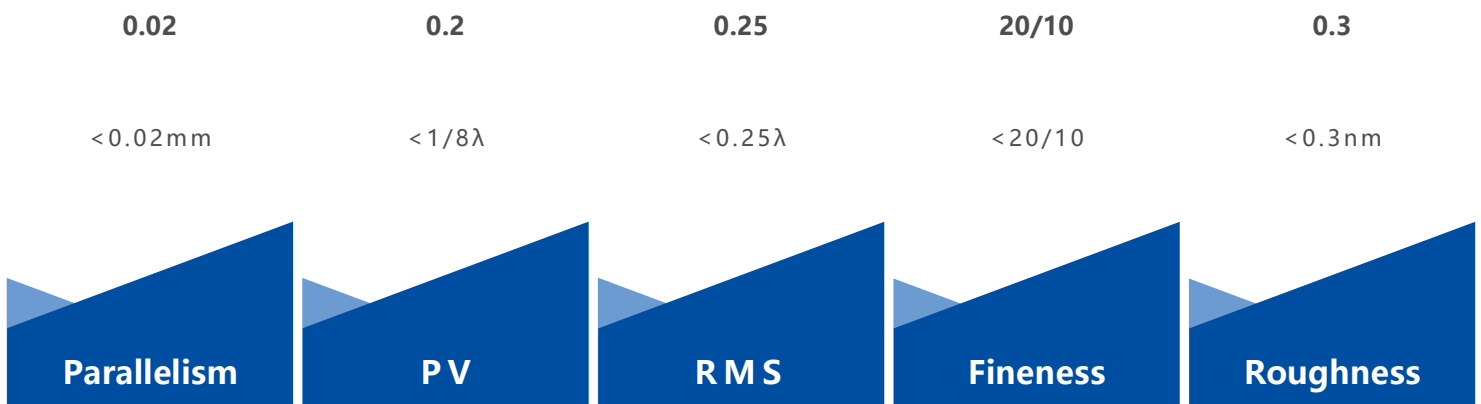
High quality substrate material, rough machining and polishing quality are the main factors affecting the performance of optical elements.

The mirrors are made of imported Corning 7979 and 7980 materials with guaranteed quality;

For high-power laser optical elements, it is particularly required that the edge collapse of the substrate should be well controlled, otherwise the mirrors film will crack and extend in the process of use.

The surface finish and roughness of the substrate will greatly affect the damage threshold of the film.

The surface shape of substrate will affect the shape of laser spot, so PV and RMS need to be controlled.



2) High Coating Quality

Coating is the core process of the scanning mirror, and the following factors need to be considered:

- I Good reflectivity of the lens under different incident angles;
- II Under different incident angles, the reflectivity of the probe light is high enough;
- III After coating, the deformation of the substrate should be small enough. The stress relief design of the film must be considered;
- IV Good laser damage threshold;



Coating Deformation

PV < 0.3λ, RMS < 0.4λ

Finish after Coating

< 20/10

Laser Reflectivity

HR, R > 99.8% @ 1070nm / HR, R > 99.5% @ 1030-1090nm,
AR, R < 0.1% @ 1030-1060

Probe Light Reflection

R > 90% @ 400-700nm

Incidence Angle

HR: 37.5±15°, 45±15°
AR: 0±10°, 45±15°

Core Advantages——High damage laser threshold coating

Medium Power Use

Average Power

> 6000w @ 1064nm

Power Density

> 1000W/cm²

Damage Threshold

> 10J/cm² @ 1064nm, 10ns

High Power Use

Average Power

> 8000w @ 1064nm

Power Density

> 2000W/cm²

Damage Threshold

> 30J/cm² @ 1064nm, 10ns



