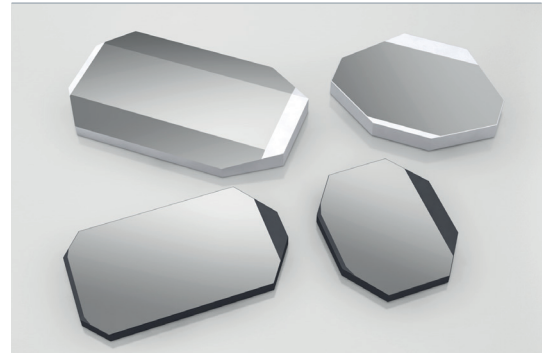


# Laser Scanning Mirrors

## Mirrors for High Performance Galvano Scanning Applications

Materion Balzers Optics offers a large variety of customer specific Laser scanning mirrors as they are applied for example in mirror galvanometer scanner units. Coated with the unique metallic Silflex™ material, these mirrors are well suited for a wavelength range from 450nm up to 5000nm with a possible optimization for selected ranges from the UV to the IR. Especially an optimized design with a reflectivity >99% @1064nm can be offered for all applications in conjunction with Nd:YAG Laser units. Since Silflex generates a lower level of stress in the thin films, the substrate flatness accuracy is not affected.



### Benefits

- High reflectivity over a large angular range
- Customized shape on Silicon or Fused Silica
- Lightweight – considering the surface flatness
- No wavelength shift and good environmental stability
- Wavelength dependency design optimization

### Technical Data

#### Typical:

$R \geq 98\%$  avg for 450-5000nm for 22-58° q-pol

$R \geq 99\%$  abs for 1064nm for 22-58° q-pol

Flatness: PV < 150nm over CA Ø10mm

Cosmetic: 5/3x0.16

LIDT: 1J/cm<sup>2</sup> (10ns pulse)

Customized Silicon or fused silica substrates

#### Environmental Resistance and Durability

The coating withstands the following tests on glass substrates

**Temperature** (MIL-M-13508 C, para. 4.4.4)

5 h each at -62 °C and +71 °C

**Hardness** (MIL-M-13508 C, para. 4.4.5)

50 strokes with cheesecloth

**Adherence** (MIL-M-13508 C, para. 4.4.6)

Scotch tape test

**Humidity** (MIL-M-13508 C, para. 4.4.7)

24 h at 49 °C r.h. 95%

**Salt Fog** (MIL-M-13508 C, para. 4.4.8)

24 h salt spray 4.5% NaCl

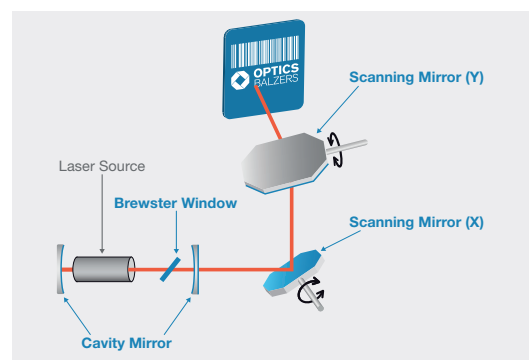
#### Cleaning

Silflex™ withstands immersion in acetone, ethanol, etc. As specified in MIL-C48497, para 4.5.4.2. It can be cleaned with a soft cotton cloth soaked in mild soapy water, ethanol or other non-abrasive substances.

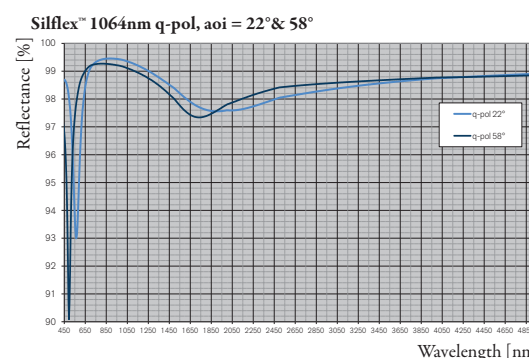
### Applications

Typical these mirrors steer a processing laser over a range up to  $\pm 30^\circ$  in the X- and Y-axes. Scanning speed easily achieves the range of several kHz. Therefore, galvano scanning mirrors have to be optimized in terms of mechanical and optical properties to suit both, the forces of movement and the stress generated by the power of the processing laser. The shape, thickness and material can be customized, other wavelengths are upon request.

#### Application of Laser Scanning Mirrors



Typical reflectance curve for q-pol, measured at two angles of incidence. Design optimized for 1064nm.



Optics Balzers AG  
Neugrüt 35  
LI-9496 Balzers

Liechtenstein  
T +423 388 9200  
F +423 388 9390  
info.mbo@materion.com  
www.materionbalzersoptics.com

MBO 052 PE (2206-1)

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Subject to technical change without notice