

## Multi-line Optics for Military Laser Applications

REO's multi-wavelength optics are intended for military target designation and rangefinding applications which require high optical performance and exceptional environmental stability. Specifically, these components deliver a unique combination of high reflectivity or transmission at multiple wavelength bands (e.g. 808 nm, 1064 nm and 1570 nm), while also maintaining excellent wavefront quality. These optics can also accommodate high reflection or high transmission properties in the 3  $\mu\text{m}$  to 5  $\mu\text{m}$  spectral band, enabling common aperture FLIR applications. REO multi-spectral optics also exhibit high laser damage threshold.

These performance characteristics are difficult to achieve because multi-wavelength coatings of this type are often physically thick. This makes it challenging to keep film absorption and defects below acceptable limits, and to control layer stress which may lead to wavefront issues. However, REO utilizes a range of fabrication and coating technologies, including advanced plasma source (APS) and ion beam sputtering (IBS) coating to enable the necessary level of control over coating structure, stoichiometry and stress.

These optics can be fabricated on a wide range of substrates and sizes. Plano, spherical and aspheric surfaces can all be produced, as can non-circular and non-rectangular geometries, including substrates with through holes.

If you need multi-wavelength optics for performance critical applications, then *think REO*.



### Typical Specifications

Materials	Fused silica, CaF <sub>2</sub> , ZnS, ZnSe, Si and sapphire
Typical Wavelengths of Operation	808 nm, 1064 nm, 1570 nm, 3 $\mu\text{m}$ – 5 $\mu\text{m}$
Reflected Wavefront Distortion	$\lambda/10$ @ 633 nm
Peak reflectivity	>99.99%
Damage threshold (for a high reflector)	>40 J/cm <sup>2</sup> for a 20 nsec pulse at 1064 nm
Temperature range	-196 °C to 400 °C
Humidity range	0 to 100%
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Size range (length)	12 mm to 300 mm
Surface Quality	20-10
Clear Aperture	90%