Ultrafast Laser Pump Mirrors Optimized for Negative GDD

These ultrafast dichroic pump mirrors are designed to support cutting edge performance in femtosecond titanium:sapphire (Ti:S) lasers. This is achieved through the use of thin film coatings that generate negative group delay dispersion (GDD) to compensate for positive GDD caused by other cavity components.

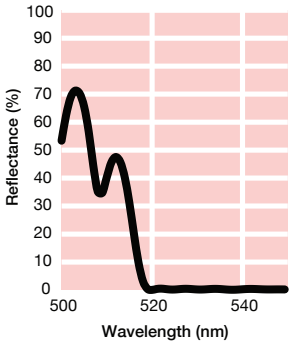
These focusing (concave) optics provide broadband performance, delivering >99.7% reflectivity over the entire 675 – 1100 nm wavelength range, while also providing high (>98%) transmission at the 532 nm pump wavelength. This broadband reflectivity makes these optics ideal for use in virtually any Ti:S oscillator, particularly one-box models. Examples include broadband (very short pulse) oscillators, widely tunable oscillators for microscopy and spectroscopy, and fixed wavelength oscillators for seeding ultrafast amplifiers.

Even if it produces broadband output, a high performance femtosecond laser oscillator's pulsewidth is often limited by the positive GDD, caused principally by the transmissive optics in the laser cavity, including the Ti:S crystal itself. This can be partially offset by the use of reflective cavity optics with negative GDD. These enhanced pump mirrors from REO typically deliver up to 100 fs^2 of negative GDD. In addition they are designed for minimum Third Order Dispersion (TOD) to further simplify the laser designer's task of achieving the shortest possible transform-limited pulsewidth.

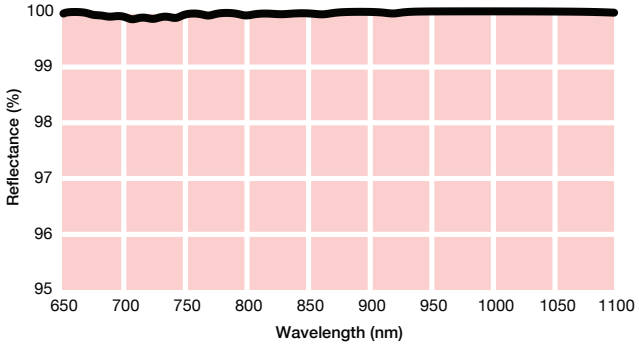
These spherical mirrors are offered with a radius of curvature of 10 cm, 15 cm or 50 cm, with flats and other radius values available upon request. Standard diameters are 7.75 mm (0.3 in.), 12.75 mm (0.5 in.) and 19 mm (0.75 in.).

Typical Specifications	
Substrate Material	Fused Silica
High reflectance wavelength range	675 nm to 1100 nm
Reflectivity	99.7%
Transmission at 532 nm	>98%
Surface quality	10-5 or better
Size range	0.3" to 0.75"
Radius of curvature	10 cm, 15 cm or 50 cm
Temperature range	–196 °C to 400 °C
Clear Aperture	90%

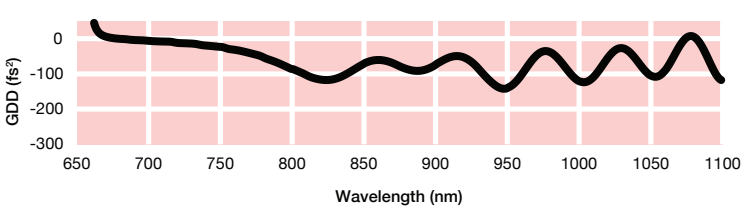
Reflectance



Reflectance



Group Delay Dispersion



Third Order Dispersion