

# BragGrate™ - Mirror

## Reflecting Bragg Grating (RBG) for laser mode selection

### Product Description

The BragGrate™ Mirror is a reflecting volume Bragg grating recorded in a bulk of photosensitive silicate glass. BragGrate™ Mirrors are placed in a laser resonator which enables spectral and thermal management of the laser radiation. The laser mode structure is controlled by the longitudinal mode selection with the bandwidth down to 10 GHz and the customized central wavelengths with accuracy of 0.1–0.5 nm. BragGrate™ Mirrors have a record low absorption and scattering that allows them to withstand record high optical densities of up to 10 J/cm<sup>2</sup>. This also yields a thermal laser wavelength shift reduction of up to 5 pm/K at 532 nm.

### Standard Parameters

Center Wavelength: 405, 6XX, 7XX, 8XX, 9XX, 10XX, 15XX, 19XX nm

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Spectral Bandwidth (FWHM): 0.1–0.3 nm

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Diffraction Efficiency 10–35, 90, 99 %

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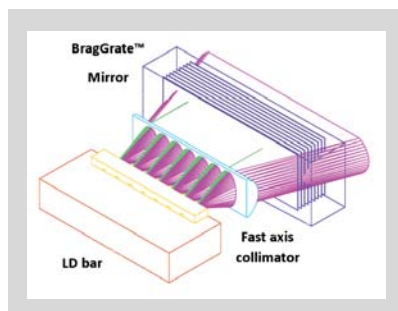
Lateral Dimensions: 1.5×2, 1.5×12, 5×5, 8×8 mm<sup>2</sup>

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Thickness 1, 2.5, 4.0 mm

### Applications

- Longitudinal and transverse mode selection in laser resonators
- Solid-state lasers
- High-power diode lasers
- MM and SM diode lasers for spectroscopy
- Fiber lasers
- Laser radars, LIDARS, etc...



Schematics of LD bar stabilization with a BragGrate™ Mirror.

### Specifications

Diffraction Efficiency (DE): 3–99.7%

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Spectral Bandwidth: 20 pm to 0.5 nm

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Wavelength Range: 350–2700 nm

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Grating Thickness: 0.50–20 mm

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Apertures: up to 35×35 mm<sup>2</sup>

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Angular Selectivity: 1–100 mrad

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Incident/Output Angles: 0–45 deg

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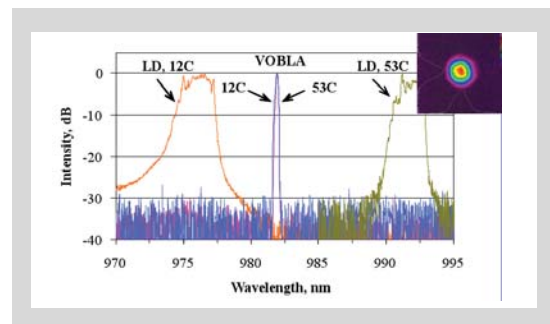
Grating to Surface Tilt Angle: 0–10 deg

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Absorption/Scattering Losses: <2%

### Advantages & Features

- High power operations, over 1 kW
- High energy operations up to 5 J/cm<sup>2</sup>
- Low to No power penalty
- Unrestricted lifetime, no degradation of parameters has been detected for over 10 years
- Narrowing of laser line down to 20 pm with superior thermal stability
- Environmental stability
- No polarization dependence
- Unique solutions to achieve SFM oscillations
- Near-diffraction-limited beam quality



Normalized spectra of 2W free running LD and with BragGrate™ Mirror at different T. The narrowed linewidth was < 45 pm.

Insert: mode profile with a 10% DE BragGrate™ Mirror