Data Sheet

Pulse Compression Gratings

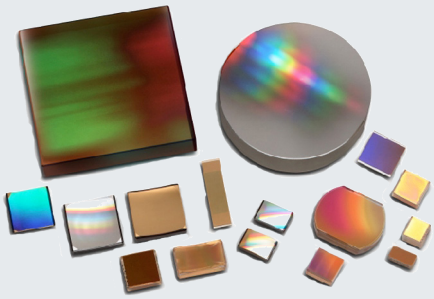
Headwall's pulse compression gratings are optimized for high-power laser cavities.

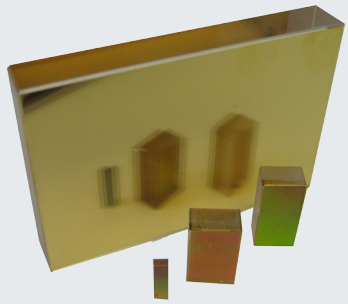
Headwall's pulse compression gratings enable higher peak power and narrower pulse widths in industrial and research laser applications. Our high efficiency TM polarization designs typically exceed 90% diffraction efficiency with superior spatial uniformity. Specialized near-Littrow designs enable compact stretcher/compressor configurations that use a single grating instead of multiple gratings and focusing optics. Diffraction efficiency response is exceedingly flat across the spectral band.

Headwall's All-Original gratings perform better than replicated and ion etched silica gratings in high power applications. Holographic originals are the grating of choice for high power fiber laser applications. All-Original gratings can withstand peak power and thermal shock an order of magnitude higher than replicated gratings.

For enhanced thermal stability, pulse compression gratings are fabricated on low expansion glasses (Corning ULE or HPFS). Headwall's gratings are All-Original Holographic Master gratings and never replicated, meaning the first prototype and the 1000th grating will exhibit exactly the same diffraction efficiency, wavefront, beam quality and environmental stability. Plus, Headwall's diffraction grating products exceed the Telcordia GR-1221 standard for long term environmental survivability performance.

Through collaborative development, Headwall will optimize the grating performance for your specific cavity geometry and beam requirements. We have experience with design for fiber amplifier lasers, TiSa, Ytterbium, Yttrium, ND:glass and OPCPA amplified lasers, as well as test-and-measurement systems for spectral analysis of the laser pulse. Our gratings can be found in laser systems supporting holography, Bose-Einstein and Molecular condensates, laser surgery, Raman and absorption spectroscopy, and microscopy.





APPLICATIONS

- Industrial/Research Lasers
- TiSa
- Ytterbium
- Yttrium
- OPCPA

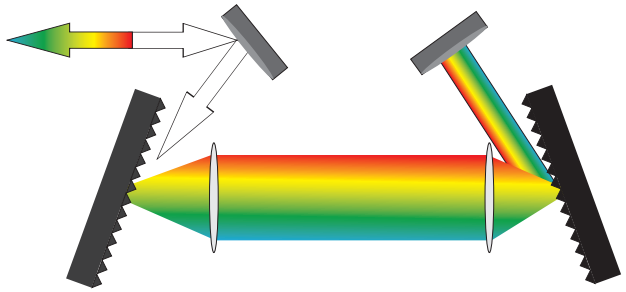
KEY BENEFITS

- Rapid prototyping for design evaluation
- Gratings are all-original, not replicates
- Greater than 90% efficiency
- Very low absorption materials
- Exceeds Telcordia GR-1221 standards
- Groove frequencies from 100-4000 gr/mm
- Wavelengths from 200 - 1800 nm

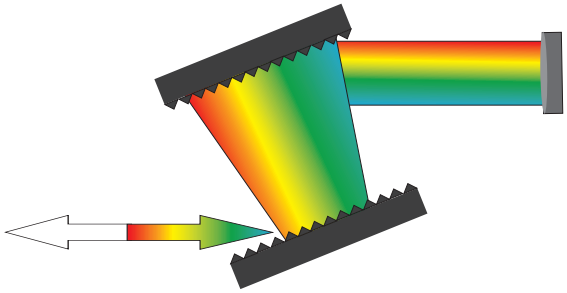
Application-Specific Solutions For Critical Environments

Pulse Compression	TM Polarization (Typical)
	Typical Efficiency: > 90%
	Telcordia Compliant (GR-1221).
Common Specifications	
Wavelengths	from 200 - 1800 nm
Groove Frequencies	100 - 4000 gr/mm
Coatings	Aluminum and Gold
Flatness	Better than l/10 RMS @ 632.8 nm
Substrates	ULE (Corning Ultra-Low-Expansion glass)
	HPFS (Corning High-Purity Fused Silica)
Dimensions	Length to 75 mm
	Height to 50 mm
Groove Perpendicularity	<0.2 deg (default); <0.1 deg (by request)

Dispersive Grating Stretcher

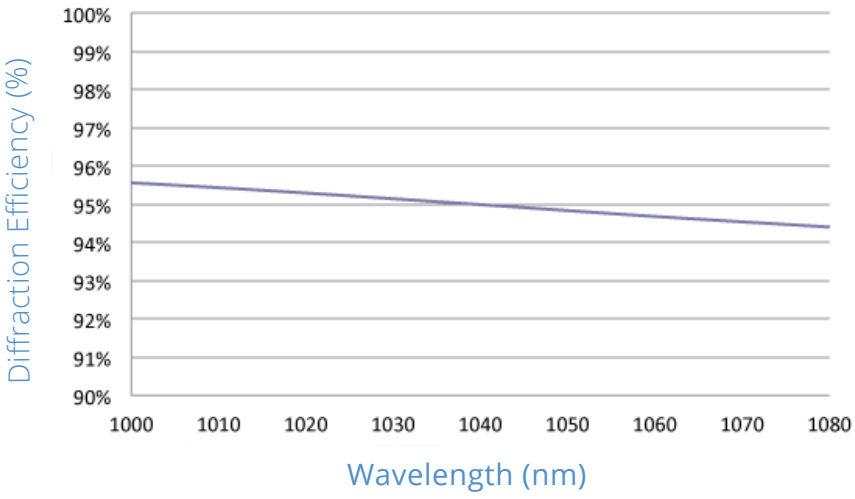


Dispersive Grating Compressor



Headwall optimizes grating performance for specific cavity geometry and beam requirements. We design for fiber amplifier lasers, TiSa, Ytterbium, Yttrium, ND:glass and OPCPA amplified lasers.

Ytterbium Laser Pulse Compression Grating



About Headwall Photonics: Headwall is the leading designer and manufacturer of imaging spectrometers and spectral instrumentation for industrial, commercial, and government markets. Headwall's high performance spectrometers, spectral engines, and holographic diffraction gratings have been selected by OEM and end-user customers around the world for use in critical application environments. As a pioneer in advanced, patented optics technology, Headwall enjoys a market-leading position through the design and manufacture of spectral instrumentation that is customized for application-specific performance.