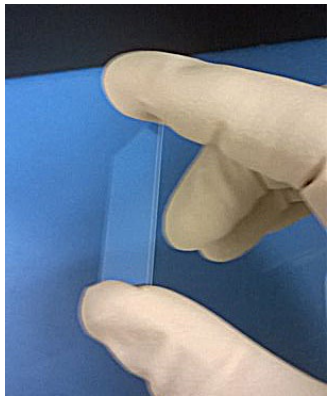
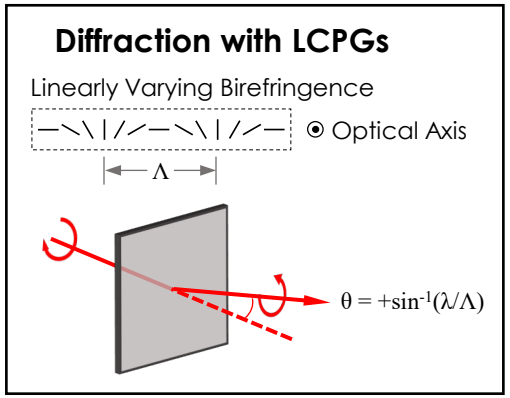
Liquid Crystal Polarization Gratings

NEW

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Polarization Gratings diffract circularly polarized light very efficiently into either the +1 or -1 order of the grating. By combining the properties of polarizing beam splitters and efficient diffraction gratings in one thin optic, LCPGs have applications in beam steering, phase microscopy, polarimetry, and more.





SHARED SPECIFICATIONS		
Substrate Material	Corning EAGLE XG	
Substrate Sizes / Clear Apertures	0.5 in. × 0.5 in. (12.7 mm × 12.7 mm) 1.0 in. × 1.0 in. (25.4 mm × 25.4 mm)	0.34 in. × 0.34 in. (8.7 mm × 8.7 mm) 0.76 in. × 0.76 in. (19.4 mm × 19.4 mm)
Substrate Thickness	0.02 in. (0.5 mm)	
Transmitted Wavefront Distortion	≤ λ/4 RMS at 532 nm (Typical)	
Surface Quality	60 – 40 scratch-dig	

NARROWBAND LCPG SPECIFICATIONS	
Design Wavelengths	532 nm, 1064 nm, 1550 nm (please specify)
Diffraction Angles	**532 nm**: ±1˚, ±2˚, ±4˚ **1064 nm:** : ±1˚, ±2.5˚, ±5˚ **1550nm:** ±1˚, ±2.5˚, ±5˚, ±10˚
Diffraction Efficiency†	≥ 99%
Total Efficiency‡	≥ 90%

BROADBAND VISIBLE LCPG SPECIFICATIONS	
Wavelength Bandwidth	450 – 700 nm
Diffraction Angles at 532 nm / (Grating Pitches)	±1˚, ±2˚, ±4˚ / (30.5 µm, 15.2 µm, 7.6 µm)
Diffraction Efficiency†	≥ 90% over 450 nm – 700 nm ≥ 95% over 550 nm – 650 nm
Total Efficiency‡	≥ 80% over 450 nm – 700 nm ≥ 85% over 550 nm – 650 nm

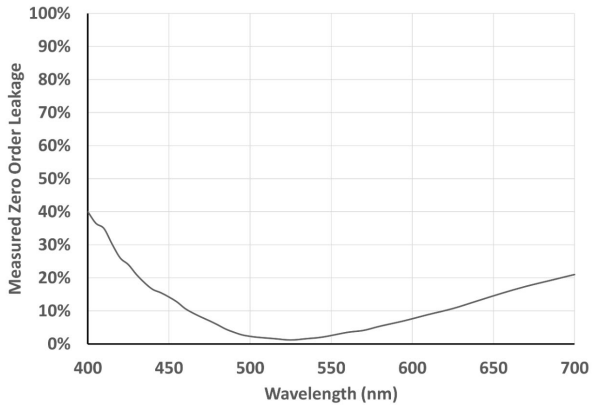
†Diffraction Efficiency defined as the power in the desired first-order beam divided by the sum of all power in all diffracted orders. Assumes circularly polarized incident light.
‡Total Efficiency defined as the power in the desired first-order beam divided by the power in the incident beam. Includes surface reflection losses.

Liquid Crystal Polarization Gratings, cont.

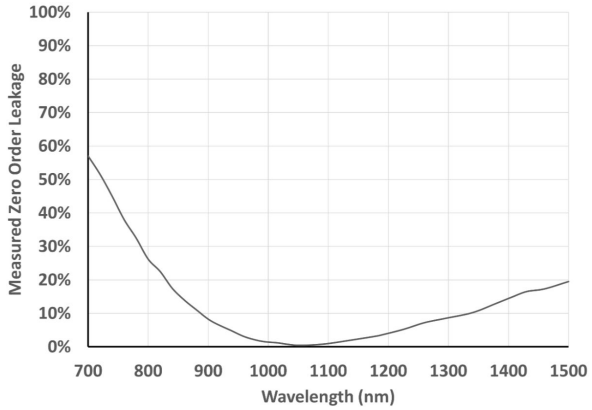
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Typical Diffraction Spectra for LCPGs

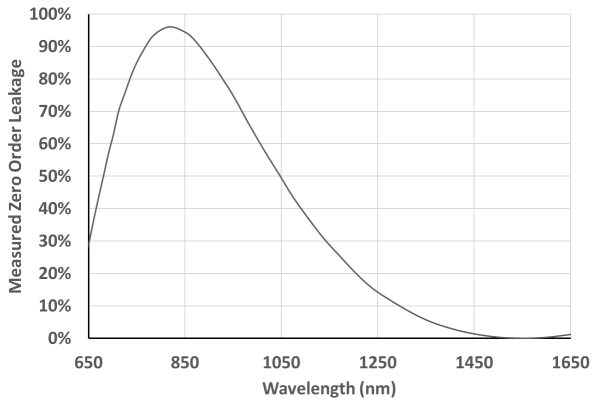
Narrowband 532 nm LCPG



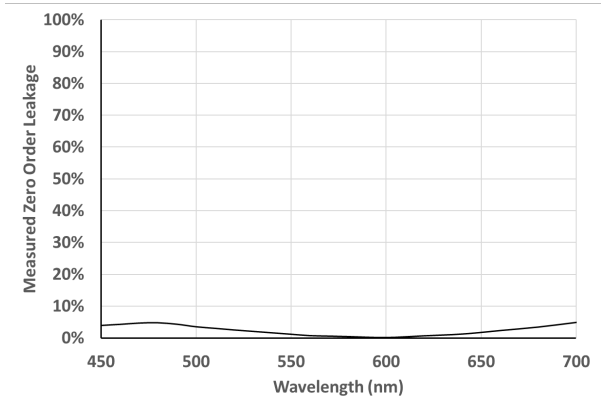
Narrowband 1064 nm LCPG



Narrowband 1550 nm LCPG



Broadband Visible LCPG



The plots above illustrate the typical diffraction spectra of narrowband and broadband LCPGs by measuring the leakage into the 0^{th} order (i.e., undiffracted transmission). Peak diffraction efficiency occurs where the plots have a null, representing >99.5% diffraction efficiency in all cases.

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