

Diffractive Gratings

Gratings, Beam Splitters, Pattern Generators for Structured Light Patterns

Features

- Standard or custom
- Sinusoidal, binary, or other grating profiles
- Photoresist on silica, or etched silica
- Other substrate materials available
- High diffraction efficiency
- Uniform interbeam intensity
- Operating wavelengths 250 nm to 1550 nm

Applications

- General or high-precision beamsplitting
- Machine vision systems
- Multiple imaging
- Spectrometry
- Beam sampling
- Metrology

Typical Dimensions 1 mm (0.4 in 9.5 mm (0.375 in.) ↓ 15.9 mm (0.625 in.)

Mechanical Specifications



Some Available Patterns





Diffractive Gratings Gratings, Beam Splitters, Pattern Generators for Structured Light Patterns

Custom Diffraction Optical Elements (DOE)	5 9 11 15 19 33 99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	25 169 170.6 338.2 532 25.7 16.4 33 50.4 100 426.1 260 illable with similar spec	1.54 0.23 0.23 0.11 0.07 1.49 2.34 1.16 0.76 0.38 0.09 0.15 ecifications. Please call for information on other path	6.14 0.91 0.90 0.91 0.58 14.94 32.78 20.94 13.71 12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	9 11 15 19 33 99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	169 170.6 338.2 532 25.7 16.4 33 50.4 100 426.1 260 iilable with similar spec	0.23 0.23 0.11 0.07 1.49 2.34 1.16 0.76 0.38 0.09 0.15 ecifications. Please call for information on other patt	0.91 0.90 0.91 0.58 14.94 32.78 20.94 13.71 12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	9 11 15 19 33 99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	170.6 338.2 532 25.7 16.4 33 50.4 100 426.1 260 illable with similar spec	0.23 0.11 0.07 1.49 2.34 1.16 0.76 0.38 0.09 0.15 ccifications. Please call for information on other patt	0.90 0.91 0.58 14.94 32.78 20.94 13.71 12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	9 11 15 19 33 99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	338.2 532 25.7 16.4 33 50.4 100 426.1 260 illable with similar spec	0.11 0.07 1.49 2.34 1.16 0.76 0.38 0.09 0.15 crifications. Please call for information on other path	0.91 0.58 14.94 32.78 20.94 13.71 12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	11 15 19 33 99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	532 25.7 16.4 33 50.4 100 426.1 260 illable with similar spec	0.07 1.49 2.34 1.16 0.76 0.38 0.09 0.15 ecifications. Please call for information on other path	0.58 14.94 32.78 20.94 13.71 12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	11 15 19 33 99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	25.7 16.4 33 50.4 100 426.1 260 iilable with similar spece	1.49 2.34 1.16 0.76 0.38 0.09 0.15 crifications. Please call for information on other path	14.94 32.78 20.94 13.71 12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	15 19 33 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	16.4 33 50.4 100 426.1 260 iilable with similar spec	2.34 1.16 0.76 0.38 0.09 0.15 crifications. Please call for information on other path	32.78 20.94 13.71 12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	19 33 99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	33 50.4 100 426.1 260 iilable with similar spec	1.16 0.76 0.38 0.09 0.15 ccifications. Please call for information on other path	20.94 13.71 12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	 33 99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light 	50.4 100 426.1 260 iilable with similar spect	0.76 0.38 0.09 0.15 ccifications. Please call for information on other path	13.71 12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	 33 99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light 	100 426.1 260 illable with similar spec vailable to satisfy	0.38 0.09 0.15 crifications. Please call for information on other path	12.28 2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	99 ¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	426.1 260 iilable with similar spec vailable to satisfy	0.09 0.15 ccifications. Please call for information on other path	2.88 14.47 terns.
Custom Diffraction Optical Elements (DOE)	 Multiple line patterns are also ava At 670 nm. Custom elements are also a beams, and structured light 	260 iilable with similar spec vailable to satisfy	O.15 crifications. Please call for information on other path	14.47 terns.
Custom Diffraction Optical Elements (DOE)	¹ Multiple line patterns are also ava ² At 670 nm. Custom elements are also a beams, and structured light	ilable with similar spec	cifications. Please call for information on other patt	terns.
Custom Diffraction Optical Elements (DOE)	Custom elements are also a beams and structured light	vailable to satisfy		
Diffraction Equation	vary between 0.05° and 20°	patterns. Wavele (in some case, up	y a wide range of wavelengths, interbe engths can be between 250 nm and 15 <u>5</u> o to 30°). Contact us for more informat	eam angles, number of 50 nm. Interbeam angles ion. es or dots)
Surfaction Equation	the tonowing equation is used to calculate the annaction angle of the pattern (intes of dots).			
c	d (sin θ m) = m λ or θ m = ard	$\operatorname{csin}\left(\frac{\mathrm{m}\lambda}{\mathrm{d}}\right)$	where d = DOE period (μ m) θ m = diffraction angle of the mth beam (°) λ = wavelength (μ m)	
5-line pattern +2 laser light interbeam angle diffraction grating spreading angle θ_s reading	Note that θ m is the diffraction angle measured from the normal to the mth beam (assuming the incident laser beam is normal to the DOE plane). It is different from the interbeam angle, which is the angle between two neighboring beams (you can calculate the interbeam angle by letting m = 1). The beams (or orders) are numbered starting from the central beam (order o) with the positive orders on one side (+1, +2, +3) and the negative orders on the other side (-1, -2, -3). The spreading angle θ s between the two outmost beams (or lines, when a line generating lens is added) is twice the angle of the higher order beam.			
point source	diffraction angle of the seco	and order beam.	vitir a perioù u = 25 µm, trie spreaung	angle us is twice the
6	$\theta s = 2\theta m = 2\theta 2 = 2 \operatorname{arcsin} \left(\frac{2}{2}\right)$	$\frac{20.670 \ \mu m}{25 \ \mu m}$	$\theta s = 6.14^{\circ}$	



Phasemask Technology, LLC 48521 Warm Springs Blvd., Suite 301 Fremont, CA 94539, USA Tel.: 408-718-1513 Email: Sales@phasemask.com