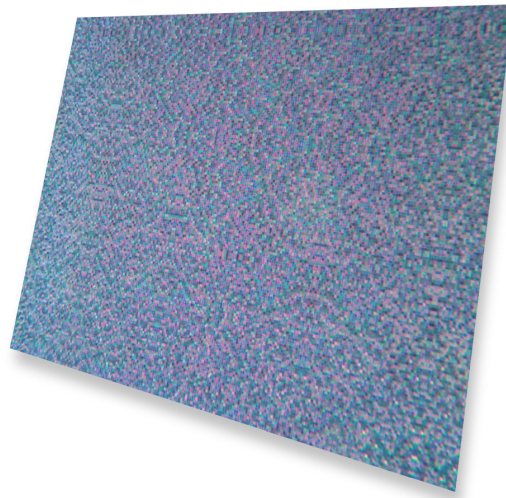


DIFFRACTIVE OPTICS

Diffractive Optical Elements (DOE) Diffusers

Coherent provides Diffractive Optical Elements (DOEs) for demanding industrial and consumer applications. DOEs are lithographically patterned and offer complete phase control of transmitted light without limitations imposed by refractive optics. A micron-thick active phase-transforming layer is directly etched into chemically inert dielectrics on robust fused silica substrate. An organics-free material platform is characterized by excellent reliability and can withstand harsh environmental conditions, high optical power and temperatures up to 500°C. Coherent DOEs undergo extensive quality assurance, have a proven reliability track record and are competitively priced.



FEATURES

- Designed for good transmissivity and uniformity
- Uniform illumination - even in the corners
- Designed to reduce speckle noise
- Customizable design of power vs deflection angle
- Stock designs are optimized for Coherent VCSEL arrays
- Micron-scale active layer thickness
- Etched directly into robust fused silica substrate and chemically inert dielectrics, no organics or polymers
- Wafer-scale mass production
- Withstand temperatures up to 500°C
- High power handling up to 125 GW/cm²
- Excellent long-term reliability

APPLICATIONS

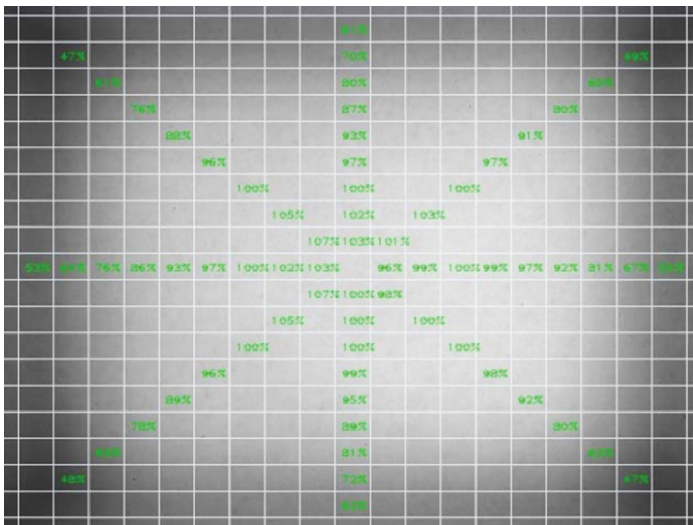
- Illuminators for Time-of-Flight 3D sensing (cell phones, consumer electronics, autonomous vehicles)
- Flood illuminators for 2D sensing
- High power beam homogenizer (laser machining)

abrication is based on robust deep ultraviolet (DUV) photolithography and a reactive ion etch process. Wafer-scale DOE optics are mass-produced using robust volume fabrication methods of the electronic IC industry and is easily scalable to multiple millions of micro-optical devices per year.

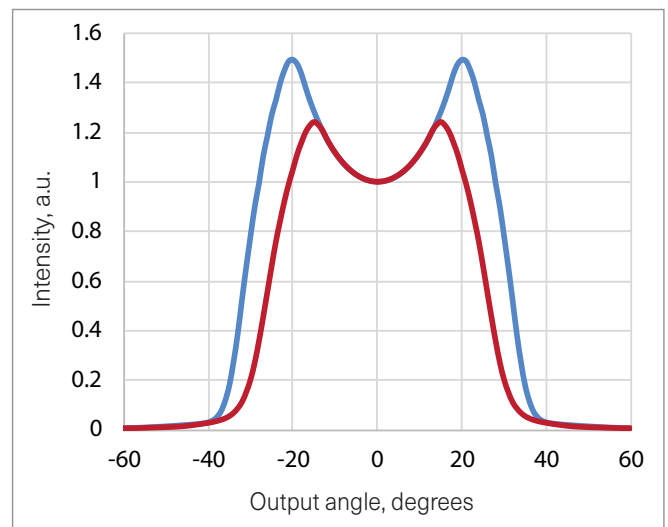
Diffusers are used to homogenize light and expand a narrower source beam into a broader range of angles. Often diffusers are designed to have more optical power at larger deflection angles in order to produce uniform field of illumination on a flat backdrop.

OEM-Customizable Specification

Description	Value	Units	Comments
Field of Illumination (FOI)	60x45	°	Full width half maximum, intensity vs. output angle
Power vs angle	custom	mW/°	"batwing" \cos^7
Uniformity in FOI	± 10	%	Average deviation from design profile, intensity vs. angle
Design Wavelength	940 \pm 10	nm	Custom wavelengths available
Transmissivity, min	>85	%	Ratio of input power to diffused power
Substrate (WxH)	Custom		± 0.1 mm dimension tolerance
Substrate thickness	0.675 \pm 0.025	mm	0.3 mm option
Substrate (WxH)	Custom		± 0.1 mm dimension tolerance
Substrate thickness	0.675 \pm 0.05	mm	Down to 0.2 mm custom
Substrate Material	Chemically inert dielectrics on glass substrate		
Back side AR coating	Yes		
Surface quality	60/40	Scratch/dig	40/20, 20/10 also available.
Operating temperature	-125 to 500	°C	



Camera view of far field on flat screen



Illumination vs output angle cross-section
(blue: wide angle; red: narrow angle; input source NA 0.2)