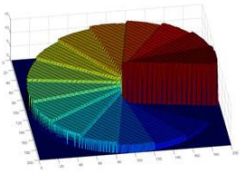
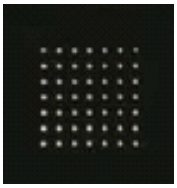
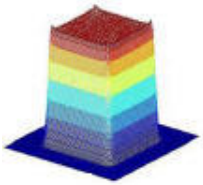
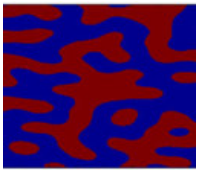
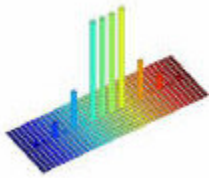
HOLO/OR - The early pioneer of diffractive optics - Since 1989

In the past 19 years we developed, designed and manufactured a variety of diffractive optical elements that accomplish difficult tasks, conventional optics fails to address effectively. Proven solutions developed for High power lasers include:

❑ Uniform Splitting of beams	❑ Beam Sampling
❑ Tailored Shaping of spots	❑ Chromatic and Spherical Aberration Correction
❑ 1D, 2D and 3D Spot Array Generation	❑ Intensity profile management
❑ Diffusers and Homogenizers	❑ Lenslet Arrays, Symmetric and Asymmetric
❑ Top-Hat Beam Shaping	❑ Tailored spot SHAPES and sizes

The company employs highly skilled personnel, and occupies a production facility at the Kiryat Weizmann High-Tech Industrial Park, Rehovot, Israel. Holo-Or has a full capability of developing and manufacturing diffractive optical elements in clean room facilities. The company holds key patents on its method of manufacturing Diffractive Elements. Holo-Or is cooperating with www.LaserComponents.com and other distributors.

SERVICES & CAPABILITIES

❑ Diffractive optical elements: Custom & Stock	❑ Reactive ion and wet etching and photolithography for UV, VIS and IR materials
❑ Optical design incorporating diffractive optics	❑ Mask fabrication
❑ Diffractive design and performance analysis	

HOLO/OR
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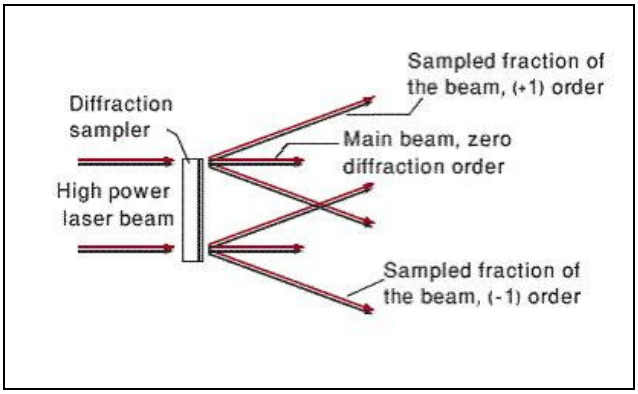
DIFFRACTIVE-CORRECTED FOCUSING LENS

Our single diffractive-corrected focusing lens demonstrates sharp focusing with diffraction-limited spot-size. The lens is fabricated by etching an aberrations-correction diffractive microrelief pattern on the plane side of a bulky spherical plano-convex lens. A selection of our standard designs is displayed below.

Selected designs	Part number	Wavelength	Efl	Diam.
	SE-201-A-Y-A	10.6 µm	1.5 ″	1.1″
	SE-204-A-Y-A	10.6 µm	2.5 ″	1.1″
	SE-205-A-Y-A	10.6 µm	2.5 ″	1.5″

BEAM SAMPLER

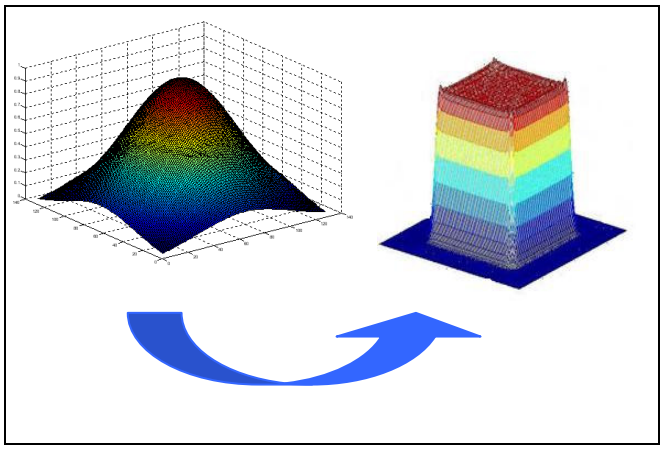
Diffractive beam samplers are used to monitor high-power lasers by extraction of exact sampled copies of the beam with only a small fraction of the total power. The passing beam corresponds to the zero diffraction order, while two sampled beams propagate at the symmetrical angles of the first diffraction orders. We offer our high quality beam samplers for various angles and power fractions of sampled beams.



Selected designs	Part No.	Function	Dim.	Wavelength	Nomin. angle sep.	Ratio/ Angle
	SA-010-I-Y-B	Sampler	12x12mm	1.06 µm	15.2 deg	0.40%
	SA-012-U-N-B	Sampler	12x12mm	0.355 µm	5.1 deg	3.8%
	SA-020-A-Y-A	Sampler	27.94 mm	10.6 µm	12.8 deg	0.40%
	SA-022-A-Y-A	Sampler	25.4 mm	10.6um	21.0 deg	1%

TOP-HAT BEAM SHAPING

The diffractive top-hat beam shapers are diffractive phase optical elements used to transform a near-gaussian incident laser beam into a uniform-intensity spot of either round or rectangular shape with sharp edges. Applications include laser heat treatment, annealing of surfaces in machinery and microelectronics, optical heads of laser writers and optical information processing



Selected designs

Part Number	Wavelength (nm)	Component diameter (mm)	Input Beam 1/e2 (mm)	Working distance (mm)	Image Size 1/e2	Image Shape
TH-001-A-Y-A	10600	38.1	25	250	3 mm	Round
TH-002-A-Y-A	10600	27.94	12	250	6x6 mm	Square
TH-003-A-Y-A	10600	12.7	3.7	42.5	300X100 um	Line
TH-005-C-Y-A	9250	27.94	12	63.5	350 um	Round
TH-008-C-Y-A	9250	27.94	12	62.9	260x260 um	Square
TH-203-D-Y-A	2940	11	4	80	200 um	Round
TH-012-H-Y-A	1319	20	7	43.2	170 um	Round
TH-014-I-Y-A	1064	20	7	42.52	190 um	Round
TH-015-I-Y-A	1064	25.4	5.1	infinity	0.83 deg	Line
TH-017-I-Y-A	1064	50	39	20000	635x5.3 mm	Rectangular
TH-018-I-Y-A	1064	38.1	13	20000	635x635 mm	Square
TH-019-I-Y-A	1064	25.4	3	100	210x210 um	Square
TH-101-I-Y-A	1064	25.4	3	100	150 um	Round
TH-016-K-Y-A	980	25.4	7	infinity	0.94x0.94 deg	Square
TH-033-M-Y-A	800	25.4	6	200.29	3 mm	Round
TH-031-Q-Y-A	532	25.4	5	52.4	100 um	Round
TH-034-Q-Y-A	532	25.4	2.5	99.5	100x100 um	Square
TH-035-Q-Y-A	532	25.4	2.5	99.5	90 um	Round
TH-043-U-Y-A	355	20	8	49.8	15 um	Round
TH-046-U-Y-A	355	12.7	2.5	95	80x80 um	Square
TH-044-V-Y-A	337	20	8	49.395	20 um	Round
TH-051-W-Y-A	266	25.4	5	42	150 um	Round

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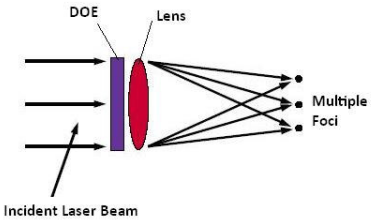
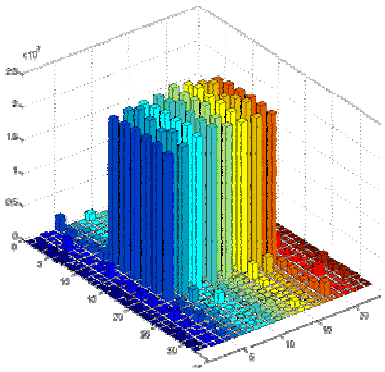
BEAM MULTIPLICATION AND MULTIPLE-SPOT LENSES

Diffractive beam-multiplication elements split a laser beam into several beams, each with the characteristics of the original beam except for power and angle of propagation. Focusing multi-spot elements provide a line or an array of identical focal spots located in the focal plane, with spacing between neighboring spots.

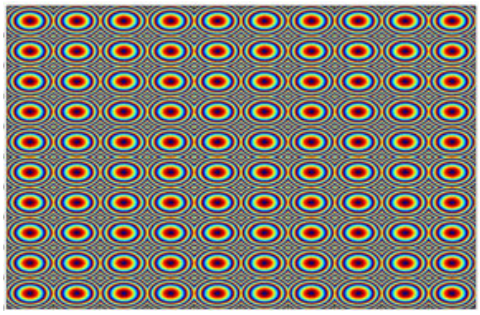
Selected designs

Part Number	Type	Wavelength (nm)	Separation Angle (degrees)	Dimensions (mm)
DS-001-A-Y-A	Double spot	10600	1.35	27.94
DS-002-A-Y-A	Double spot	10600	2.7	27.94
TS-028-A-Y-A	Triple Spot	10600	0.5	27.94
MS-214-E-Y-A	Multi spot 1X6	2790	1.5	25.4
MS-210-G-N-A	Multi Spot 1x27	1550	0.4	25.4
DS-033-I-Y-A	Double spot	1064	10	25.4
TS-031-I-Y-A	Triple Spot	1064	5	25.4
MS-213-I-Y-A	Multi spot 1X11	1064	1.2	11
DS-033-Q-Y-A	Double spot	532	5	25.4
TS-031-Q-Y-A	Triple Spot	532	2.5	25.4
MS-214-Q-N-A	Multi spot 1X6	532	0.28	25.4
MS-207-Q-N-B	Multi Spot 1x81	532	0.13	25.4x25.4
DS-006-U-Y-A	Double spot	355	0.85	25.4
TS-008-U-Y-A	Triple Spot	355	0.42	25.4
DS-006-W-Y-A	Double spot	266	0.64	25.4
TS-008-W-Y-A	Triple Spot	266	0.32	25.4
MS-030-A-N-A	Multi-spot 2X2	10600	10	25.4
MS-218-H-Y-A	Multi-spot 9x9	1320	0.62	11
MS-027-I-Y-A	Multi-spot 9X9	1064	0.5	25.4
MS-212-I-Y-A	Multi-spot 15x15	1064	0.5	25.4
MS-217-X-Y-A	Multi-spot 5X5	894	1.63	11
MS-025-Q-N-A	Multi-spot 5X5	532	0.5	25.4





LENSLET ARRAYS



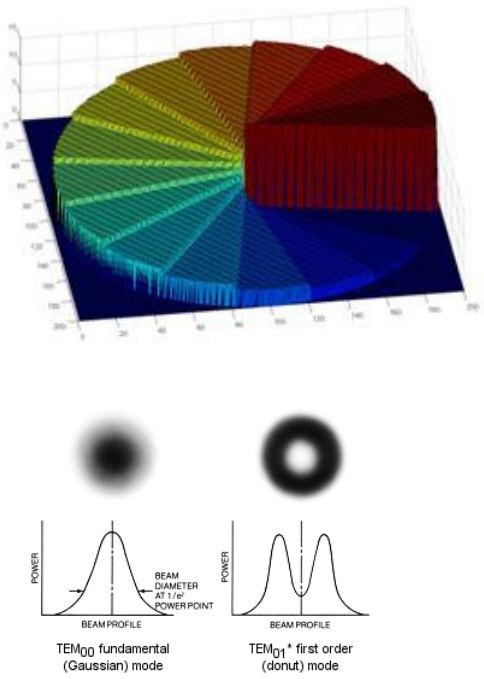
A set of small spherical, aspherical or cylindrical lenses on a single substrate is called a lenslet array. It is used for focusing and sampling as well as for diffusing of light. The Diffractive lenslet arrays we offer have the advantage of a fill factor of 100%, and a diffraction limited focal spot size. We also have the flexibility to design each of the lens-elements independently from its neighbor.

VORTEX LENS

A Vortex Lens is a diffractive optical element characterized by a spiral phase profile that converts a TEM00 laser beam mode into a helical mode resulting in a doughnut-shaped intensity distribution. The VL series Vortex lenses are available in pure fused silica or ZnSe with an optional high power AR V-Coating on both surfaces, which makes them superior to competing solutions. This can reduce the back reflection to a typical 0.2% (0.1% per surface).

Selected designs

Part Number	Wavelength (nm)	Levels	Diameter (mm)
VL-201-A-Y-A	10600	4	15
VL-203-A-Y-A	10600	8	15
VL-205-A-Y-A	10600	16	15
VL-207-A-Y-A	10600	4	25
VL-208-A-Y-A	10600	8	25
VL-209-A-Y-A	10600	16	25
VL-202-I-Y-A	1064	4	11
VL-204-I-Y-A	1064	8	11
VL-206-I-Y-A	1064	16	11
VL-207-I-Y-A	1064	4	25
VL-208-I-Y-A	1064	8	25
VL-209-I-Y-A	1064	16	25
VL-202-M-Y-A	800	4	11
VL-204-M-Y-A	800	8	11
VL-206-M-Y-A	800	16	11
VL-207-M-Y-A	800	4	25
VL-208-M-Y-A	800	8	25
VL-209-M-Y-A	800	16	25

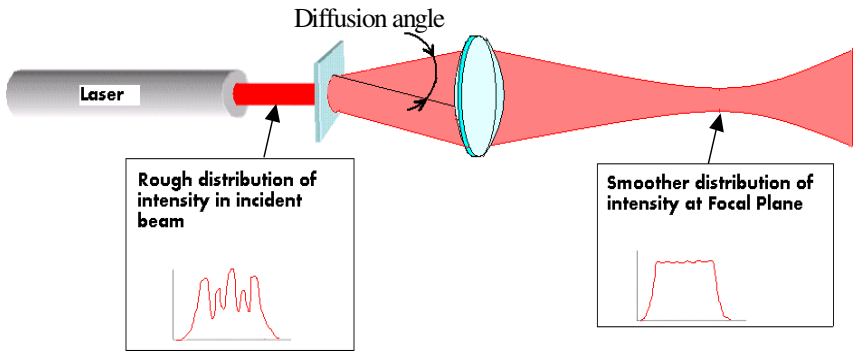


TEM_{00} fundamental (Gaussian) mode

TEM_{01}* first order (donut) mode

HOMOGENIZERS

Holo-Or's Diffractive Homogenizers consist of Fused Silica, ZnSe or Sapphire with an optional high power
AR V-Coating on both surfaces, which makes them Superior to competing solutions. The back reflection reduces to 0.2% (0.1% per surface) with this coating. The series comes in 3 grades. Grade A will Give a typical Zero-Order of 2.5%, and maximum of 5% for 1064nm.



Selected designs

Part Number	Wavelength (nm)	Diffusion Full Angle (degrees)	Diameter (mm)	Part Number	Wavelength (nm)	Diffusion Full Angle (degrees)	Diameter (mm)
HM-201-A-Y-A	10600	5x5	25.4	***RD-203-I-Y-A***	1064	0.5	25.4
HM-202-D-Y-A	2940	5.5x5.5	11	***RD-202-O-Y-A***	694	0.5	25.4
HM-200-I-Y-A	1064	0.5x0.5	11	***ED-201-A-Y-A***	10600	12.25X7.85	15
HM-203-N-Y-A	755	1.42x1.42	25.4	***ED-203-I-Y-A***	1064	1.23X0.79	25.4
HM-203-O-Y-A	694	1.3x1.3	25.4	***ED-202-N-Y-A***	755	0.87X0.56	11
HM-200-Q-Y-A	532	0.25x0.25	11	***ED-202-O-Y-A***	694	0.8X0.51	11
HM-208-U-Y-A	355	0.92x0.92	25.4	***ED-202-Q-Y-A***	532	0.61X0.39	11
HM-202-W-Y-A	266	0.5x0.5	11	***ED-203-U-Y-A***	355	0.41X0.26	25.4
HM-201-Y-Y-A	248	0.12x0.12	25.4	***ED-202-W-Y-A***	266	0.31X0.2	11
HM-203-Z-Y-A	193	0.36x0.36	25.4	***ED-203-Y-Y-A***	248	0.29X0.18	25.4

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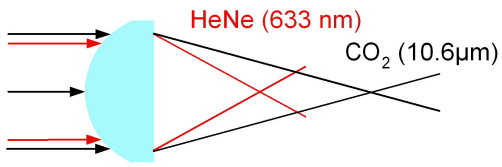
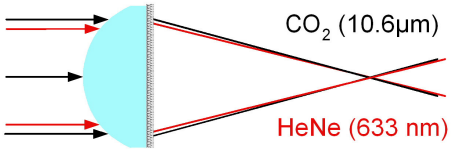
DUAL WAVELENGTH LENS

The dual wavelength beam combiners are diffractive optical elements used to bring two incident beams with different wavelengths into the same focal point.



Focusing of 2 wavelengths without correction



Focusing of 2 wavelengths with correction

General specifications for All Diffractive Optical Elements

Wavelengths	*UV-VIS-IR*	*Coating:*	*Ar/Ar, HR*
Materials	ZnSe, Sapphire, Si, Fused Silica, PMMA	*Shape:*	*Plane Window, or Lens*
Threshold	*Up to 3kW*	*Efficiency*	*Up to 98%*

We can customize, material, wavelength, diameter, beam size, working distance and other parameters.

Ask for our

- ***Standard Element, Beamsplitter or Tailored Optics Brochures that gives more details and lists more designs and design families than this short brochure.***