

Conferences and publications

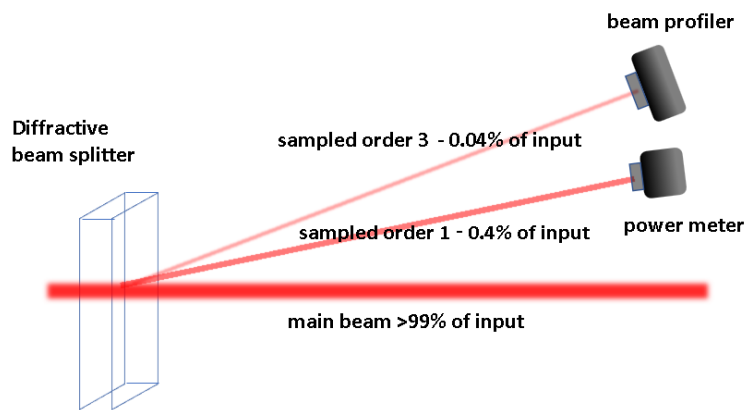
SPIE photonics west 2023

We were happy to meet our customers in the latest Photonics west exhibition. Thank you for dropping by our booth, Holo/Or had many interesting inquiries which we are sure will bloom into new solution for our customers in the laser integrators industry. If you missed us, feel free to [Contact us](#) and we will be happy to support you beam shaping needs.

Products and Applications

Keep your laser process stable with diffractive beam samplers: Ideal for high power laser processing!

Lasers power and beam shape stability are critical parameters in many industrial laser processes, especially in demanding micro-welding, ablation and micro drilling applications. Often, sampling window are employed to deflect a fraction of the beam at 90 degrees to a power meter or beam profiler. However, for precise control this method has serious drawback- the sampling is at only a certain ratio of the input, often precluding use of both power meter and beam profiler with the same window, and such window often do not have high LDT as they are multi-layer coated, precluding their use with high power densities or ultra-short pulses.



Sampling a high power laser with 2 degrees of attenuation from the same DOE sampler

A growing alternative sampling method is Holo/Or's diffractive beam sampler. This simple, robust grating-like DOE is coated with standard, robust AR coating and can handle high power densities and ultra short (including fs) pulses. Diffractive samplers have multiple orders, that can be used for sampling the beam with various ratios- for example, the first order can sample 0.2% of input beam, with the third order sampling 0.02% of the input laser. This enables use of both power meter and camera in multi KW laser setup, with each order going to the appropriate sensor.

Check out [our Diffractive Beam Samplers page](#), or [contact us](#) directly with your desired sampling ratio.

Application spotlight: Semiconductor probe card guide plate laser drilling

Semiconductor chips are produced in wafer processes, then diced and packaged as individual chips. Since dicing and packaging are high-cost processes, it is imperative to probe the chip before it is diced, to find the defective chips beforehand. For this purpose, special probe cards are connected to the on-wafer chip using a special guide plate to enable electric contact with multiple probe points. These plates must have multiple holes, often more

than a thousand, that are laser drilled in hard ceramic material. Holes and pitches are often rather small, 30-100um size, requiring delicate, precise shaping of the laser spot. This is where Holo/Or's diffractive optics play a significant role.

Diffractive optical elements offer multiple capabilities that can support this challenging laser drilling application - from [diffractive beam splitters](#) that increase the process throughput, [through top hat beam shapers that can create square holes](#), to customized DOEs that combine both splitting and beam shaping, Holo/Or provides multiple solutions that can improve the guide plate drilling process. [Contact us](#) for more details.

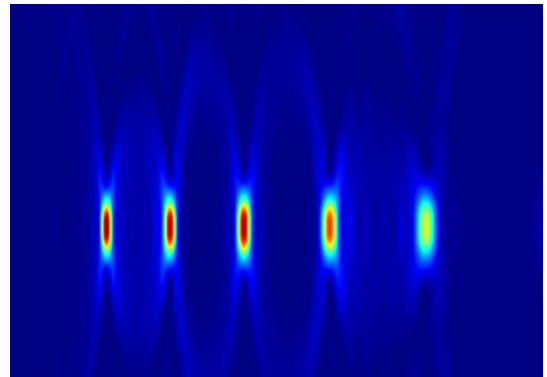
Technical tips

Correct lens selection for multifocal and elongated focus elements

Many customers are interested in [Multi-focal](#) and [Elongated Focus](#) DOE for transparent material laser cutting, using filamentation and ultra-short laser pulses, typically in the 1030-1080nm. A repeating issue is the suitability of existing Laser objectives for the glass cutting application.

To check this, one needs to compare 2 parameters:

1. the Rayleigh length in the material (you can use [our calculator](#) and multiply the result by the refractive index of the material to be cut)
2. The total depth of focus (DOF) desired in the glass to be cut (usually the glass thickness).



Effect of non-optimal focus optics used with multi-focal DOE. Orders interfere with each other.

If the ratio of DOF to Rayleigh length is 5 or less, then it is likely not possible to achieve the desired performance with the existing focus optics. A solution is to use higher NA focus optics, such as our [Multifocal Module](#)

Confused by calculations and not sure you can use our glass cutting DOE? [Contact us](#) and we will be happy to help.



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