Holo/Or Newsletter – Q4 2024

Publications and conferences

Laser glass cutting is no big deal with DeepCleave modified Bessel objectives

Our DeepCleave glass cutting objectives are becoming a standard, versatile tool for glass cutting using various methods.

In a recent article by researchers at MIT, U.Boulvard and U.Arizona, Holo/Or's ZT module-007-J00 was used to cut 1mm thick fused silica. The process employed was Laser Assisted Wet Etch (LAWE) using heated KOH. The parts cut were used for other experiments in USP effects on glass.

LAWE is useful for small scale users that want flexible laser glass cutting in limited volumes, when speed is not the main consideration.

With sufficient laser power, our DeepCleave is often used in other, siginificantly faster laser glass cutting approaches, more suitable for high volume processing. Read more about it on our glass cutting page.

When precision is critical- Diffractive Lens Arrays are the superior choice for laser lithography applications

In a recently published study project by KTH Royal Institute of Technology, various types of micro lens arrays were evaluated in multi-beam laser lithography applications. Holo/Or diffractive lens arrays were compared to refractive MLAs, Metalens arrays and FZPs, and came out first! Our diffractive lenses maintained the laser M2 with no measurable added aberrations, significantly better than refractive MLAs, while maintaining high efficiency and suppressing higher orders.

Interested in our diffractive lens arrays for your precise lithography or semiconductor application? contact us!

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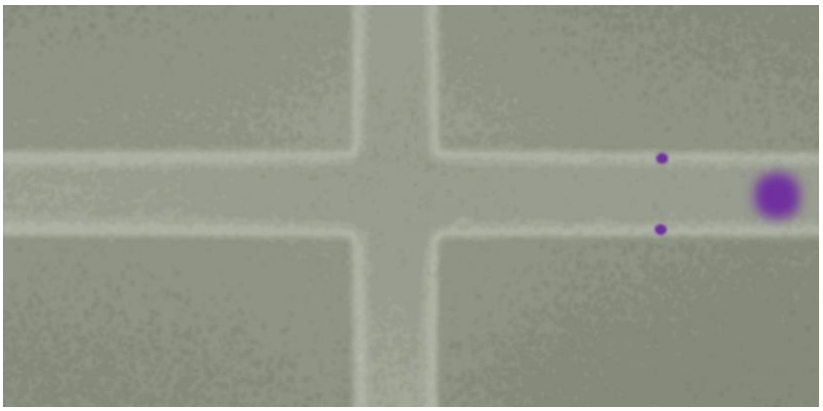
Products and Applications

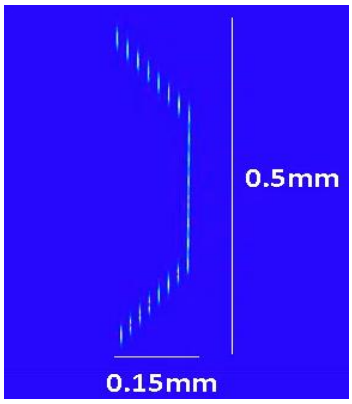
Diffractive beam splitters for semiconductor packaging applications



In semiconductor packaging, a UV laser grooving process is often used as a pre-step to dicing by saw. This prevents damage or delamination of sensitive chip structures by shear forces during singulation. Diffractive beam splitters are used both for the main groove ablation and for the pre-groove trenching step, that prevents heat from the groove from damaging the structures near the groove. With the desgin flexebility of Holo/Or's DOEs, a single element can generate a pattern that does both trenching and the main groove, saving time and increasing grooving speed.
Interested in our diffractive beam splitters? Read more here for details, or visit our catalogue page for a quote.

A new addition to our glass cutting objectives family- the EdgeCleave cutting module

While our DeepCleave objective is highly useful for straight laser glass cutting , it is not designed to enable diagonal and curved path laser glass cutting. To meet this need, Holo/Or is proud to launch our EdgeCleave, a module designed to enable cutting of curved and diagonal paths in glass over a range of up to0.5X0.5mm.



The module is based on our cutom 3D multi-focal DOEs , combined with an off-the-shelf high power objective. It can reach spot sizes of 2.5um over the entire range. The spots configuration can be customized within the range to fit your requirments- Diagonal chamfers, trapeze cuts and curves are all possible .

For larger cutting ranges, custom objectives can be designed - contact us for more details .

Technical Tips

Technical tips- advantages of single elements beam shaping

Many customers ask us about the merits of our single element Top hat beam shapers , compared to other beam shaping approaches such as two element shaping (what we call Collimated Beam Shaper) or other types of "multi-plane light conversion" .

The main advantages of single element beam shapers for high power lasers are as follows:

- Single element shapers have high LDT, and can be designed to accommodate large input beams
- Single elements are not sensitive to small angular tilts (up to 5 deg)
- Single element shapers produce the flat top shape at the system focus plane (the plane F-theta is optimized to operate at), that is relatively close to the Top Hat element. To achieve this with collimated Top Hat beams additional complex imaging is required, i.e. to achieve small images large demagnification, requiring very long optical paths (often >3m) is required.
- Single element solutions offer the same shaping quality, uniformity and defocus sensitivity as multi-element solutions. Shaping quality is a function of system parameters such NA and shape size, and not dependent on the shaping method.

Interested in learning more about beam shaping ?visit our Top hat application page