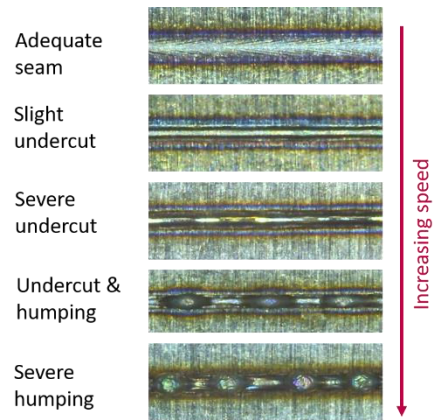


APPLICATIONS SPOTLIGHT – IT’S ALL ABOUT THE SPEED!

Enhancing laser welding speed by > 50% with HOLO/ORs Flexishaper – A diffractive beam shaping solution that generates a controlled and adjustable full-range ring-to-spot intensity distribution ratio

Many industrial welding system integrators desire to increase the processing speed of their systems, and up until recently increasing the laser power was typically enough in order to achieve that goal. Lately, thanks to the availability of high-powered NIR fiber lasers at affordable costs, power is practically no longer the limiting processing speed factor. Nonetheless, the process developers often encounter other physical phenomena which are dominant at high powers and high speeds and prevent welding at the desired available paces. Such phenomena include humping, undercut and more as seen in the image of the different seam qualities.



These phenomena can be substantially reduced, enabling **significant (>50%) increase in welding speed**, by using HOLO/OR’s **Flexishaper beam shaping module for controlled and adjustable ring-to-spot ratio**. Flexishaper is a diffractive-shaping solution which consists of two identical diffractive optical elements (DOEs) placed on the same optical axis which, when rotated against one another can shape the beam propagating through them from 100% of the power in the central spot to ~80% of the power at the surrounding ring with almost no energy at the center, **with a continuous full range control of the power ratio in between these states**.

Flexishaper was designed for process developers to enable finding the optimal power ratio between the spot and the ring. This ratio differs for different welding process parameters and different system setups, and so an adjustable ring-to-spot ratio enables the system manufacturer to find the optimal work point for each process.

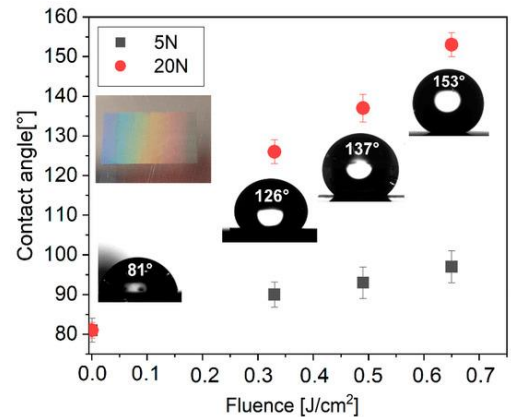
[Learn more here >>](#)

Embed video

<K:\Pictures\Product s\Flexishaper - adjustable beam shaping\V2\CU-330->

Record breaking processing speeds for laser surface texturing now enabled with DLITe beam splitter - Towards Rapid Fabrication of Superhydrophobic Surfaces by Multi-Beam Nanostructuring including a total of 40,401 Beams

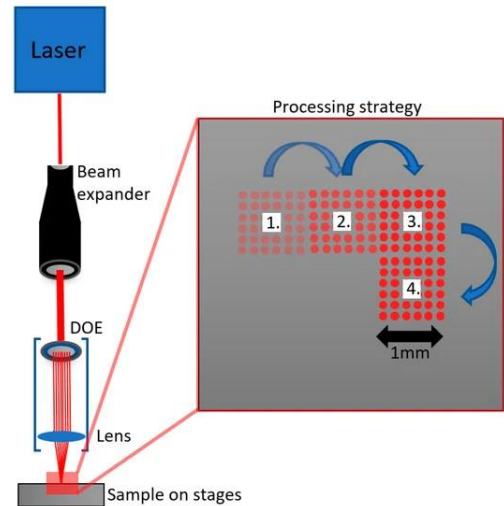
Surface texturing of superhydrophobic surfaces is long sought after, but so far was only available for very few small-scale applications due to the low processing speed, preventing it from becoming a relevant technology for large scale industrial applications, despite its attractiveness.



Applications such as de-icing, anti-corrosion, self-cleaning or drag-reduction of surfaces can be easily realized with laser micro and nanostructuring. While scanning can allow processing of thousands of spots per second, to

achieve industrial scale processing rates ($1\text{m}^2/\text{min}$), the laser beam must be split to enable structuring of multiple sites with the same pulse. This single shot area texturing concept, combined with efficient utilization of the new generation of kW-class ultrashort pulsed (USP) lasers, can achieve industrial texturing rates.

This is where [Diffractive Laser-Induced Texturing element \(DLITe\)](#) fits in. DLITe can split the input beam into an unlimited number of densely packed beams, enabling processing a large area with a single shot and minimizing stitching. In the latest collaboration with HiLASE center, a high-energy USP laser system was used, delivering up to 20 mJ at 1030 nm in 1.7 ps. The system was integrated with a novel DLITe, producing 201×201 sub-beams of $5 \mu\text{m}$ in diameter on a square area of 1mm^2 . Simultaneous nanostructuring with 40,401 sub-beams resulted in a matrix of microcraters covered by nano-gratings and ripples with periodicity below 470 nm and 720 nm, respectively. The processed area demonstrated hydrophobic to superhydrophobic properties with a maximum contact angle of 153° .



[Read the full article here >>](#)

[See available DLITe designs and ask for quote here >>](#)

NEW PRODUCTS

Now available - Cost effective diffractive vortex generator for microscopy laser applications

Vortex phase plates are often used in advanced microscopy, mostly in the STED and laser tweezing applications. By adding a vortex phase plate, it is possible to shape the spot to a donut-like distribution, with a central hole that is smaller than the diffraction limit. This enables sub-diffraction limited optical resolution by depleting fluorescent excitation in all areas outside the hole (as is done in STED), or trapping and manipulating very small particles, as is done in tweezing.

HOLO/OR's new microscopy vortex phase plates offer unparalleled phase profile accuracy, providing precise shaping to a symmetrical donut, with no undefined area in the center of the plate. Our new vortex generators have a high LDT, suitable for illumination with $> 200 \text{ W}$ of laser power, are stable at typical microscopy environmental conditions (-40 to $+120^\circ\text{C}$) and can be easily integrated into existing setups due to their compact dimensions. They can be mounted in standard 1" holder frames to facilitate integration into the laser light path.

HOLO/OR has recently developed a **new production process which enables us to offer these elements at affordable and competitive costs** to meet the growing market's needs.

[See available vortex phase plate generators here >>](#)

You ask, we oblige - New DeepCleave designs with extended depth of focus – now available!

After receiving responses and requests from several of our customers for an extended working distance DeepCleave module for glass cutting, HOLO/OR has developed 2 novel designs with increased work distance in air between 15-25mm:

PN	Wavelength	Required laser input	Input Beam Diameter (exp ⁻²)	Depth of Focus in Air*	Waist Diameter (exp ⁻²)	Working Distance
ZT Module-010-I	1064nm	Single mode M2<1.3	10mm (+-10%)	1mm	1.8um	15.5mm
ZT Module-011-I	1064nm	Single mode M2<1.3	12mm (+-10%)	1mm	1.8um	23.7mm

The new designs are [now available on our website](#) and can be customized for different depth of focus (DOF) or different IR wavelengths (1030nm, 1080nm etc.) , as needed.

Check the all new [DeepCleave installation guide](#) to make sure you achieve optimal results!

HOLO/OR offers other glass cutting solutions as well, offering different process optimization advantages per system integrator requirements and preferences. Learn more about our [variety of optical solutions for glass cutting](#).

New in the website

Technical resources added and updated

Our [technical resources](#) section in the website has been updated, with certifications of LDT for our Fused-Silica and ZnSe elements added to the [laser damage threshold page](#). We have also upgraded our [articles and whitepapers page](#) where all our articles are now available in one location.

[Contact us to discuss your project requirements](#)