

Diffraction Optical Elements

- >> Are you using a laser beam for materials processing?
- >> Are you looking to tailor your beam profile to your application?
- >> Do you require a system that can do more than one job with only minor alterations?

Laser Optical offer this service with their
Diffraction Optical Elements...



Laser Optical
Engineering Ltd

Diffraction Optical Elements

DOEs (also known as kinoforms) are computer generated holographic devices that can be used for laser beam shaping and sampling. Laser Optical specialises in the production of highly efficient DOEs to generate laser intensity distributions that cannot be achieved using conventional lenses and mirrors.

Standard laser applications that can benefit from DOEs include:

- Beam sampling
- Complex mode to flat-top conversion
- Line generation
- Beam splitting

Laser Optical offer a standard Diffractive Optical Element, as well as custom designed optics to suit your particular application.

Our standard products are reflective devices designed for CO₂ and Nd-YAG wavelengths. Custom made transmissive devices and elements for the visible region are also available. Please contact us for further details.

DOEs offer a range of benefits over conventional optics:

- Suitable for a wide variety of applications including glass cutting and pharmaceutical tablet marking
- Can transform high powered laser beams into virtually any shape
- Low maintenance
- 94% efficient

Surface of CO₂ gold-coated optic



Typically the DOE is used in place of a mirror in the laser's optical set-up. Provided the surface is kept free of contamination, no maintenance of the element is required. Efficiency figures for the DOE of as high as 94% have been achieved and the design of the kinoform allows for a broad depth of focus (typically ± 5 mm) allowing the laser system to cope with variations in the target's surface profile.

Thermal models are utilised to design optimised beam shapes. These achieve superior performance and realise processing characteristics unattainable using conventional optics. A DOE is then produced to transform the input laser beam into the optimised beam shape for the particular process.



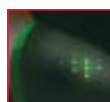
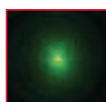
Beam sampler

Beam sampling elements can also be produced for high powered CO₂ lasers (up to 2kW). These Diffractive Beam Samplers divert a small proportion (0.1 – 0.5%) of the main collimated beam. The sampled beam can be used for on-line monitoring of laser power and beam shape. The Diffractive Beam Sampler is a reflective element which can replace a standard 45° turning mirror in the beam delivery system.

Laser Optical can offer a range of services:

- Provision of the DOE for self-mounting by the customer
- Individual mounts
- Complete optical assemblies
- A versatile interlock system to ensure safety of use

Please contact us for further details or any of our services.



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