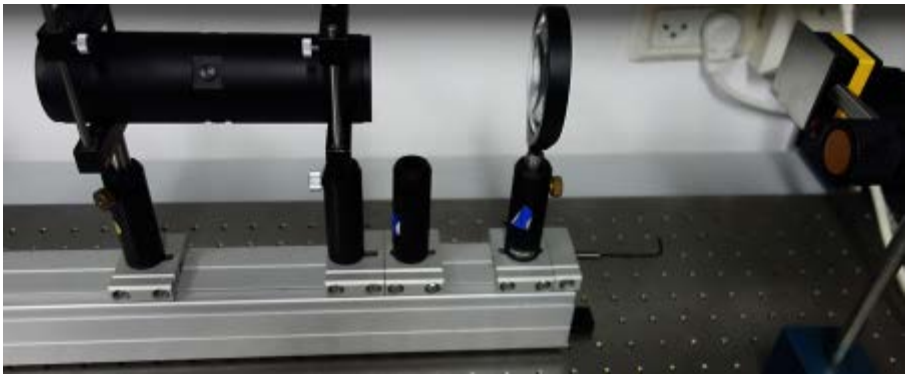
Module for blocking unwanted spots \ energy

For applications such as metrology and sensitive material processing, HOLO/OR has designed a compact universal module for blocking undesired spots of Multi-Spots or the “halo” effect of Homogenizers, providing a precise shape and energy distribution at the focal plane.

The Undesired Diffractive Order Blocker (UDOB) can also be used to increase the edge sharpness of diffusers/homogenizers.

A typical setup for a UDOB application is shown with the following sub-modules:

- Laser source
- Optional Beam Expander
- Diffractive Optical Element (DOE)
- UDOB
- Focusing system / lens
- Working plane / Camera



Physical parameters:

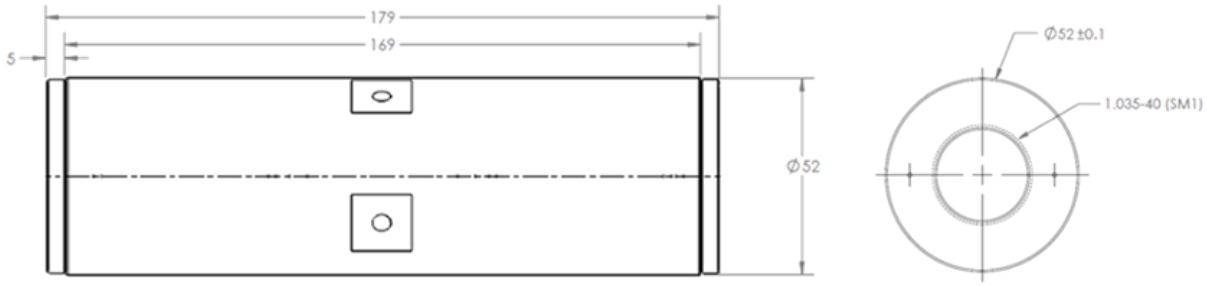
Part Number	Length [mm]	Diameter [mm]	Clear Aperture [mm]	Aperture Shape	Max. Angle* [deg]
UDOB-001	179	52	22.9	Round	0.107
UDOB-002	179	52	22.9	Round	0.0895
UDOB-003	179	52	22.9	Round	0.072

*: Maximal angle [deg] of DOE which can be used with the UDOB. After this angle, the UDOB blocks the energy. Tolerance on angle: +/- 0.0045 deg.

Other parameters:

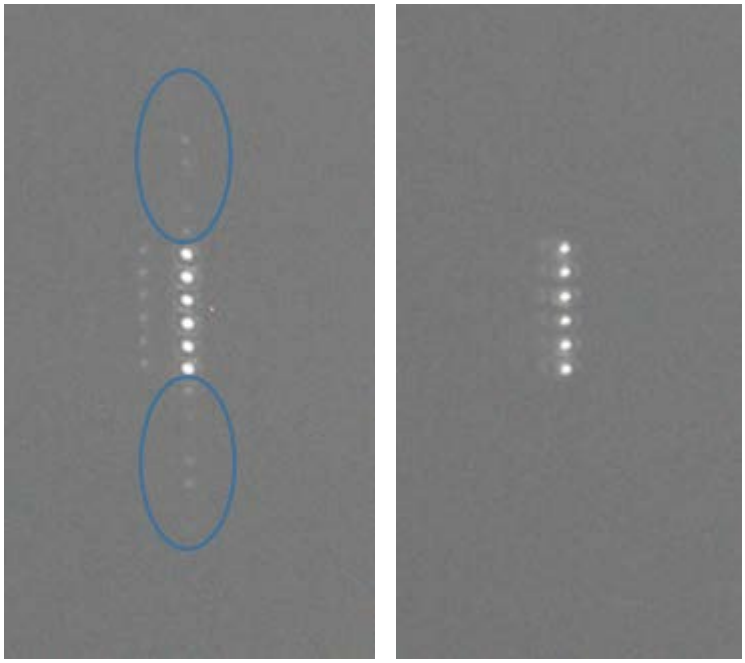
Anti-reflective coating: Coated
Wavelength [nm]: 355-1550nm (other wavelength upon request)
Recommended maximal input beam diameter [mm]: 12
Notes:

The maximal angle of DOE which can be used with the UDOB is 3x3deg (or 4 deg for round output shape)
The aperture shape can be round, square, rectangular and custom shape as multi-apertures...
Drawing:



Internal SM1 threads on both sides of the module

Experimental results of MultiSpot 1x6 with the module (right) and without (left):

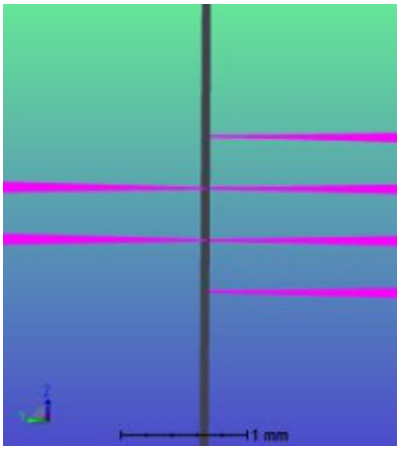


UDOB for Ultra-High power lasers:

For Ultra-High-power lasers, Holo/Or has released a new UDOB design based on folded mirrors and an aperture in the optical path.
This design is open for customers, and can be modified according to the customer's requirements.

The published version works for small angle DOEs and currently contains element DS-186-U-Y-A which is implemented in the Zemax file by a diffraction grating surface. The wavelength used in the published version is 355nm.

To use another beam splitter DOE, the diffraction grating parameters must be modified. Read this tutorial for integration of multi-spot in Zemax software:
Beam Splitter in Zemax Software Tutorial



Set-up picture: