

flat axicon

**TRANSFORMS GAUSSIAN BEAM
INTO A BESSEL-GAUSS BEAM**

WHY IT IS BETTER THAN ORDINARY AXICON?

- Positive and negative Bessel-Gauss zones - 3 in 1 usage possibilities.
- Suitable for high LIDT applications and high-power lasers.
- Flat optics - saves space, easy to handle.
- Reliable and resistant surface - the structure is inside the bulk.



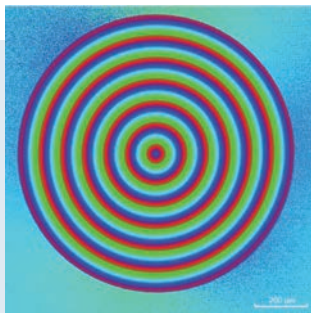
Description

Circular grating (a.k.a flat axicon) is a space-variant retarder that transforms Gaussian beam into a Bessel-Gauss beam.

The product is leading for its high damage threshold, comparing to alternative devices. It has laser irradiation resistance similar to uncoated fused silica substrates.

The structure of the element is unique due to formation birefringent nanograting's inside a bulk of fused silica glass, sensitive to the incident polarization.

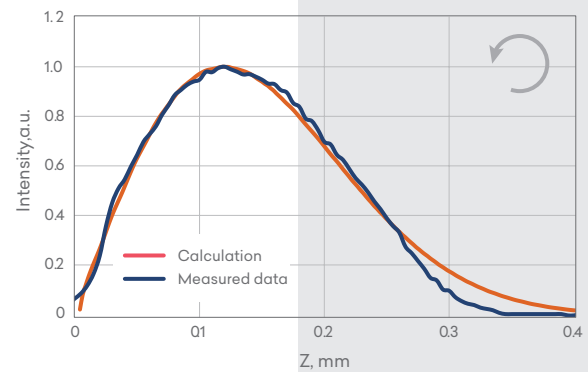
Circular grating can generate both - positive and negative Bessel-Gauss zones, separately with LHCP and RHCP polarizations. Also, positive and negative zones simultaneously with linear polarization. The working regime depends only on incident polarization.



Fast axis distribution across the element (measured with HINDS Microlmager)

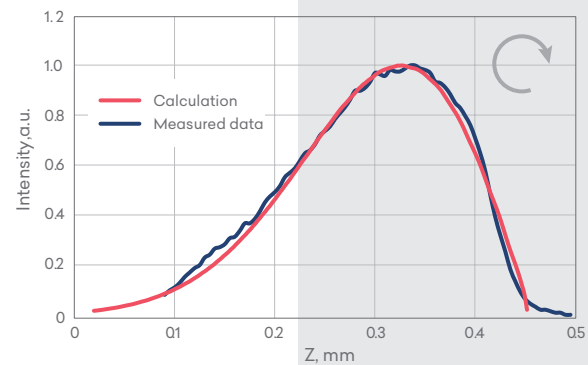
Technical features

- Material: UVFS, IRFS
- Wavelength range: 330nm to 2000 nm
- Min Apex angle: 176-179.9° @1030 nm
- Diffraction efficiency: up to 95%
- Element size: up to 15 mm
- Coating (optional): AR/AR coating
- Uncertainty of diameter of cone tip - ~20 μm
- LIDT | High damage threshold:
63 J/cm² @1064 nm, 10ns;
2 J/cm² @1030 nm, 212fs
- Transmission (no AR coating):
85% @343 nm,
92% @515 nm, 94% @1030 nm



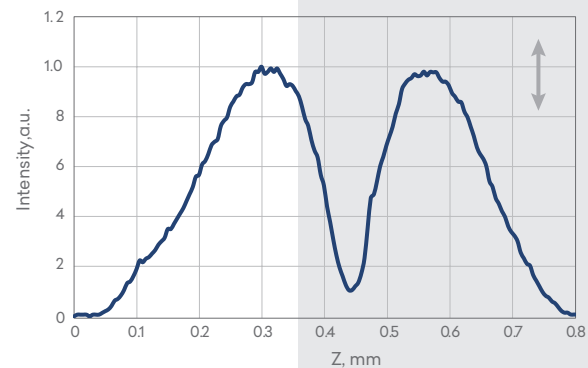
Positive Bessel-Gauss zone

Incident light polarization > left-hand circular - emulating convex axicon.



Negative Bessel-Gauss zone

Incident light polarization > right-hand circular - emulating concave axicon.



Positive & Negative Bessel-Gauss zones

Incident light polarization > linear - emulating both axicons simultaneously.

Applications

- Micromachining
- Ultra-high aspect ratio micro holes drilling
- High 90% efficiency Bragg gratings
- Cutting of transparent materials