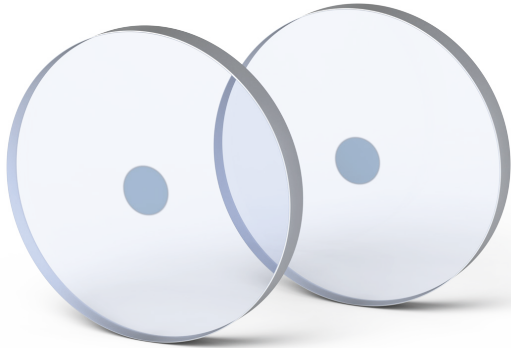


Flat Axicon

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 (left-hand circular polarization) and RHCP (right-hand circular polarization). Also, positive and negative zones simultaneously with linear polarization. The working regime depends only on incident polarization.

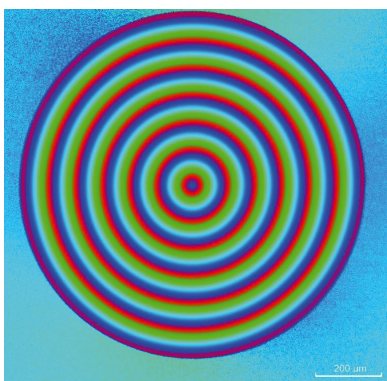


Figure 1. Fast axis distribution across the element (measured with HINDS MicroImager).

Applications

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

Standard specifications

- Material: UVFS, IRFS
- Wavelength range: 330-2000 nm
- Apex angle range: 176-179.9° @ 1030-1064 nm
- Diffraction efficiency: ~95%
- Uncertainty of cone tip diameter: ~20 μm
- Clear aperture: up to Ø15 mm
- Total transmission (without AR coating): >94% @ 1030 nm
- Coating (optional): Anti-reflective AR/AR coatings
- LIDT: >60 J/cm² @ 1064 nm, 10 ns; >2 J/cm² @ 1030 nm, 212 fs

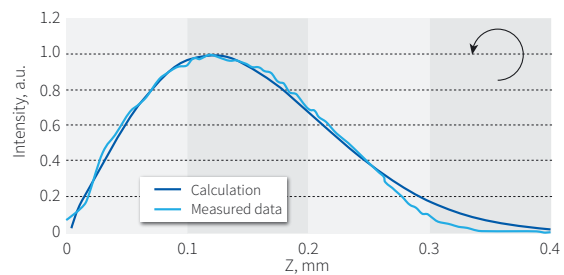


Figure 2. Positive Bessel-Gauss zone.

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

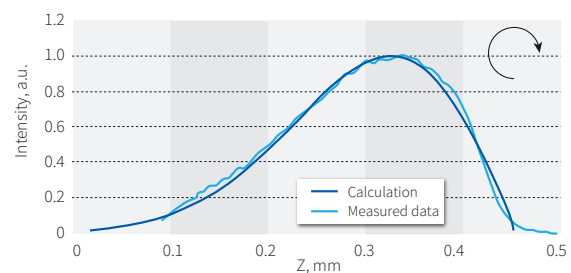


Figure 3. Negative Bessel-Gauss zone.

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

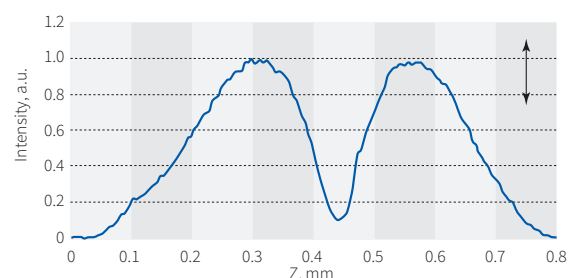


Figure 4. Positive & Negative Bessel-Gauss zones.

Incident light polarization > linear – emulating both axicons simultaneously.

Typical Items

Operational wavelength, nm	Clear aperture, mm	Product ID*
343/355	2	CG-0343-02-XXX.X
	4	CG-0343-04-XXX.X
	6	CG-0343-06-XXX.X
	8	CG-0343-08-XXX.X
	10	CG-0343-10-XXX.X
	15	CG-0343-15-XXX.X
488	2	CG-0488-02-XXX.X
	4	CG-0488-04-XXX.X
	6	CG-0488-06-XXX.X
	8	CG-0488-08-XXX.X
	10	CG-0488-10-XXX.X
	15	CG-0488-15-XXX.X
515/532	2	CG-0515-02-XXX.X
	4	CG-0515-04-XXX.X
	6	CG-0515-06-XXX.X
	8	CG-0515-08-XXX.X
	10	CG-0515-10-XXX.X
	15	CG-0515-15-XXX.X
632	2	CG-0632-02-XXX.X
	4	CG-0632-04-XXX.X
	6	CG-0632-06-XXX.X
	8	CG-0632-08-XXX.X
	10	CG-0632-10-XXX.X
	15	CG-0632-15-XXX.X
780/800	2	CG-0800-02-XXX.X
	4	CG-0800-04-XXX.X
	6	CG-0800-06-XXX.X
	8	CG-0800-08-XXX.X
	10	CG-0800-10-XXX.X
	15	CG-0800-15-XXX.X
1030/1064	2	CG-1030-02-XXX.X
	4	CG-1030-04-XXX.X
	6	CG-1030-06-XXX.X
	8	CG-1030-08-XXX.X
	10	CG-1030-10-XXX.X
	15	CG-1030-15-XXX.X
1550	2	CG-1550-02-XXX.X
	4	CG-1550-04-XXX.X
	6	CG-1550-06-XXX.X
	8	CG-1550-08-XXX.X
	10	CG-1550-10-XXX.X
	15	CG-1550-15-XXX.X

* Product ID explanation: CG-YYYY-ZZ-XXX.X

CG – circular grating

YYYY – wavelength

ZZ – clear working aperture

XXX.X – apex angle in range 175.0°-179.9° (apex angle limited to diffraction period and depends on a wavelength)

** Custom designs are available on request.