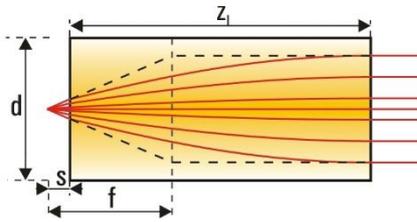


## GRIN Rod Lenses – Numerical Aperture 0.5



Gradient index lenses for fiber coupling and beam shaping of laser diodes

Diameter (mm)	Pitch P	Working distance s (mm)	Lens length z <sub>l</sub> (mm)	Focal length f (mm)	Gradient constant g (mm <sup>-1</sup> )	Refractive index at the center of the profile n <sub>0</sub>	Wavelength λ (nm)	Product code
0.50	0.25	0	1.15	0.45	1.369 - 1.349*	1.629 - 1.616*	670-1550	GT-LFRL-050-025-50-NC
	0.23	0.06	1.05	0.46	1.369 - 1.349*	1.629 - 1.616*	670-1550	GT-LFRL-050-023-50-NC
1.00	0.25	0	2.25	0.88	0.697	1.629	670	GT-LFRL-100-025-50-NC (670)
	0.25	0	2.27	0.89	0.693	1.624	810	GT-LFRL-100-025-50-NC (810)
	0.25	0	2.29	0.90	0.687	1.616	1550	GT-LFRL-100-025-50-NC (1550)
	0.23	0.12 - 0.11*	2.06	0.90	0.697 - 0.687*	1.629 - 1.616*	670 - 1550	GT-LFRL-100-023-50-NC
1.80	0.25	0	4.24	1.66	0.370	1.629	670	GT-LFRL-180-025-50-NC (670)*
	0.25	0	4.27	1.67	0.368	1.624	810	GT-LFRL-180-025-50-NC (810)
	0.25	0	4.30	1.70	0.365	1.616	1550	GT-LFRL-180-025-50-NC (1550)
	0.23	0.25 - 0.21*	3.88	1.69	0.370 - 0.365*	1.629 - 1.616*	670 - 1550	GT-LFRL-180-023-50-NC
2.00	0.25	0	4.85	1.89	0.324	1.629	670	GT-LFRL-200-025-50-NC (670)*
	0.25	0	4.88	1.91	0.322	1.624	810	GT-LFRL-200-025-50-NC (810)
	0.25	0	4.92	1.94	0.319	1.616	1550	GT-LFRL-200-025-50-NC (1550)
	0.23	0.27 - 0.23*	4.45	1.93	0.324 - 0.319*	1.629 - 1.616*	670 - 1550	GT-LFRL-200-023-50-NC

\*: depending on wavelength

- Working distance, design wavelength and lens length deviating from these standards are available on request
- 8° angled facet / other diameters (0.25 mm, 0.35 mm, 0.60 mm and 0.85 mm) are available on request
- ZEMAX files can be [DOWNLOADED](#) from our website
- For tolerances, handling and storage see page 26

GRIN rod lenses are offered without antireflection coatings as standard. Antireflection coatings (R < 1.0 % for the design wavelength and incidence angles of 0 ... 30° corresponding to measurements on a reference substrate) can be offered:

Coating Code: NC: no coating (reflection loss approx. 12 %) - standard  
 C1: λ = 450 ... 690 nm  
 C2: λ = 800 ... 1000 nm  
 C5: λ = 1310 ... 1550 nm

One - sided coatings are available on request.

Order example:

GT - LFRL - 100 - 025 - 50 - NC - (670)	
GT	GRINTECH
LFRL	Focusing Rod Lens
100	Diameter: 0.5, 1.0, 1.8 or 2.0 mm
025	Pitch: 0.25 or 0.23
50	NA: 0.50
NC	Coating Code: NC, C1, C2 or C5
(670)	Design Wavelength

Variations due to modifications of the production process are possible. It is the user's responsibility to determine suitability for the user's purpose.

\* Please note our partnership with Inscopix as our exclusive distributor for the field of neuroscience applications in non-humans (see page 8).

## Extension of Partnership

### Brain Imaging – one of the most enabling applications of GRINTECH micro optics

Endomicroscopy using GRINTECH lenses and assemblies allows an *in-vivo* imaging access to deep tissue regions in the brain, especially in non-humans. It helps to understand disease formation and progression on a cellular level of the tissue.

We are pleased to inform that GRINTECH GmbH has expanded its strategic partnership with Inscopix Inc. beyond one-photon imaging to include exclusively serving customers on behalf of GRINTECH in two-photon imaging and across all non-human neuroscience research applications.

Inscopix offers innovative products and scientific consulting services for advancing neuroscience research and we are excited to be able to partner with Inscopix to serve a broader research community. Inscopix commits to continuing to support legacy GRINTECH customers with their microendoscope imaging needs across all neuroscience preclinical imaging applications. Inscopix Field Scientific Consultants and Inscopix's Support team will now be available to all legacy GRINTECH customers and to any customer interested in leveraging microendoscope imaging for their brain research, irrespective of whether the user or lab is a customer of Inscopix instrumentation. The expanded partnership aims to benefit GRINTECH customers and the broader Neuroscience research community with a dedicated neuroscience partner, enhanced scientific support and customer service, and volume-based pricing discounts.

Going forward, Inscopix will be your primary contact for ordering GRIN lenses for non-human Neuroscience research applications. If you have a one-time, custom GRIN lens order, Inscopix will work with GRINTECH to ensure that if Inscopix is unable to fulfill the order, GRINTECH will do so.

[www.inscopix.com](http://www.inscopix.com)

For more information, please contact [info@grintech.de](mailto:info@grintech.de)

## Tolerances / Handling Instructions

### Tolerances:

For of our single lenses we have the following fabrication tolerances and quality criteria:

#### Tolerances:

lens length z:  $\pm 5\%$  due to variations of the gradient constant  
working distance s:  $\pm 0.02$  mm (only LFRL- and CFRL lens series)  
diameter d:  $+ 0 / -0.01$  mm  
- tighter diameter tolerances on request

#### Surface quality:

5 / 3 x 0.025; L 3 x 0.005; E 0  
(defined by DIN ISO 10110-7:2000-02).  
The surface quality is defined within 90 % of the lens diameter.  
Outside of this area defects are allowed.

### Storage and Handling of Lenses

#### Storage

GRIN lenses and lens systems should be stored in a dry environment. For short term storage, the plastic box or foam packing in which the lenses are shipped will provide adequate storage.

Recommended storage temperature:  $-20^{\circ}\text{C} - 80^{\circ}\text{C}$ .

**Storage boxes should ensure that the lenses do not touch each other to prevent chipping and scratches. Best is to use the original box.**

#### Handling

Lenses should be carefully handled with plastic tweezers, preferably those with a tapered end. Lenses should be picked up out of their individual compartments by firmly holding each on its side cylinder surface (not the polished ends). Especially small sized lenses may stick to the lens box material and can be lost during removal.

#### Cleaning

If it is necessary to clean the lens surfaces due some dust or other contaminant which may impair the optical performance. GRINTECH generally recommends the use of ethyl alcohol as a cleaning solvent, maybe combined with some smooth lintfree lens cleaning tissue.

Acetone may also be used, but it should be pure enough, otherwise it might leave some residue on the lens surface.