NEW High-NA chromatic and field corrected Endomicroscopic Imaging Objectives with reduced curvature (MO-ACR-REDUCURV)

GRINTECH's new variant of high-NA Endomicroscopic Imaging Objectives with object Numerical Apertures of 0.7 are offered in a broad achromatic and field corrected version to significantly increase the usable field of view. A combination of four micro lenses achieves the same chromatic and off-axis performance as our MO-ACR-series with reduced field curvature which allows for acquisition of smaller image stacks and addressing more applications.

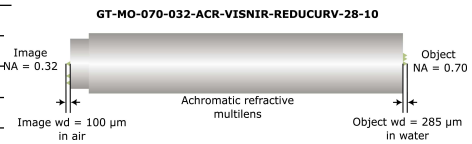
Applications:

In vivo endomicroscopy, single photon fluorescence microscopy, nonlinear optical imaging modalities (SHG, TPF), tissue imaging, flexible fluorescence microscopy, NA conversion, especially all applications that require less curvature

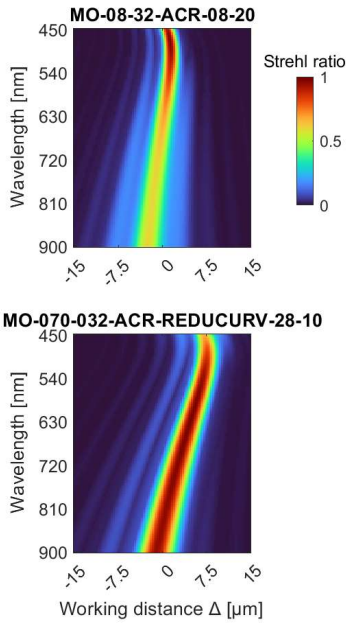
GT-MO-070-032-ACR-VISNIR-REDUCURV-xx-xx represents high resolution field and color corrected objectives with a magnification of 2.2. The image side NA of 0.32 matches to imaging fiber bundles. Color correction is achieved from 450 nm to 900 nm with an optimal performance from 488 nm to 900 nm. The objectives are assembled in stainless steel mounts.

The new micro objective type with reduced field curvature is offered so far as a version for usage without cover glass. Here you can compare with our MO-ACR series. Please note also the different mechanical dimensions.

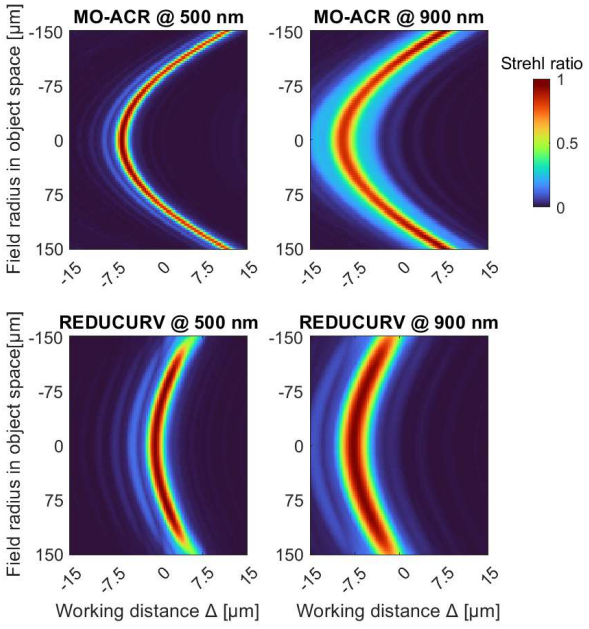
	GT-MO-070-032-ACR-VISNIR-**REDUCURV**-28-10	GT-MO-080-032-ACR-VISNIR-08-20
Object NA	0.70	0.79
Object WD in water [μm]	285	80
Designed for cover glass [μm]	none	none
Image NA	0.32	0.32
Image WD in air [μm]	100	200
Magnification	2.2	2.3
Field curvature radius [mm]	**2**	**0.55**
Dimensions Ø / L [mm]	2.2 /13	1.3 / 4.7



Chromatic Aberration in Object Space



Field Dependent Strehl Ratio in Object Space



Variations due to modifications of the production process are possible. It is the user´s responsibility to determine suitability for the user´s purpose.
For tolerances, handling and storage see page 28
More information can be found here: Stark, S. L., et al. (2023). "Field curvature reduction in miniaturized high numerical aperture and large field-of-view objective lenses with sub 1 μm lateral resolution." Biomedical Optics Express **14**(12).

Tolerances / Handling Instructions

Tolerances:

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

Tolerances:		Surface quality:
lens length z:	± 5% due to variations of the gradient constant	5 / 3 x 0.025; L 3 x 0.005; E 0
working distance s:	± 0.02 mm (only LFRL- and CFRL lens series)	(defined by DIN ISO 10110-7:2000-02).
diameter d:	+ 0 / -0.01 mm	The surface quality is defined within 90 % of the lens diameter.
	- tighter diameter tolerances on request	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°C - 80°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.