

MI PLAN Series

Multi-Immersion Planar Objective Lenses – Ideal for Cleared Samples



Background

Two- and three-dimensional deep tissue imaging usually requires clearing while keeping the sample's structure intact. Most of today's clearing protocols involve agents and immersion media with specific optical characteristics (high RIs up to 1.57 and specific dispersions), which have to match those of the objective lens for optimum results. Additionally, deep tissue imaging requires large free working distances. Conventional water, glycerin or oil immersion lenses do not meet these requirements.

LaVision BioTec's Approach

For best results when it comes to deep tissue imaging of cleared samples, LaVision BioTec developed special apochromatic planar multi-immersion objective lenses.

Key Parameters

NA	Numerical Aperture	Determines how much light enters the objective; the higher, the better the resolution
WD	Working Distance	Distance between front lens element and focal plane; the depth in which a researcher can image
RI	Refractive Index	Determines how light propagates through the immersion medium
Dispersion	Change of RI with wavelength	

Highlights

- Tailored to the optical characteristics (RI and dispersion) of a wide range of immersion media with RIs from 1.33 (water) to 1.57 (organic solvents)
- Correction of chromatic aberration
- Resistance against common media used for tissue clearing
- Long WDs for deep tissue imaging of large samples
- Correction of curvature of field (flat-field-correction) for images that are in common focus throughout the field of view
- Highly suitable for light sheet microscopy

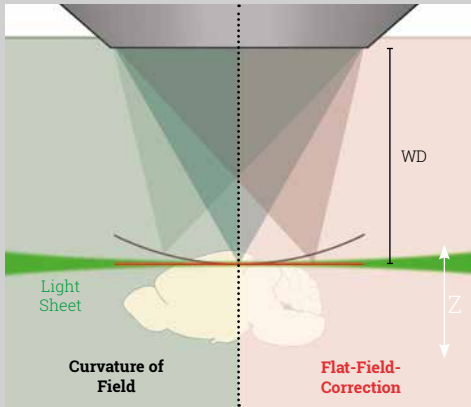
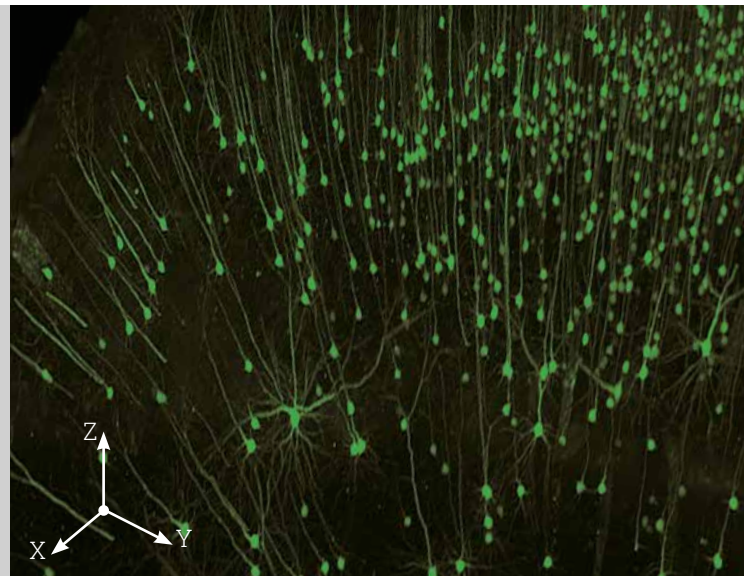


Figure 1: The flat-field-correction of LaVision BioTec's MI PLAN objective lenses guarantees a flat focal plane matching the optical axis of a light sheet.

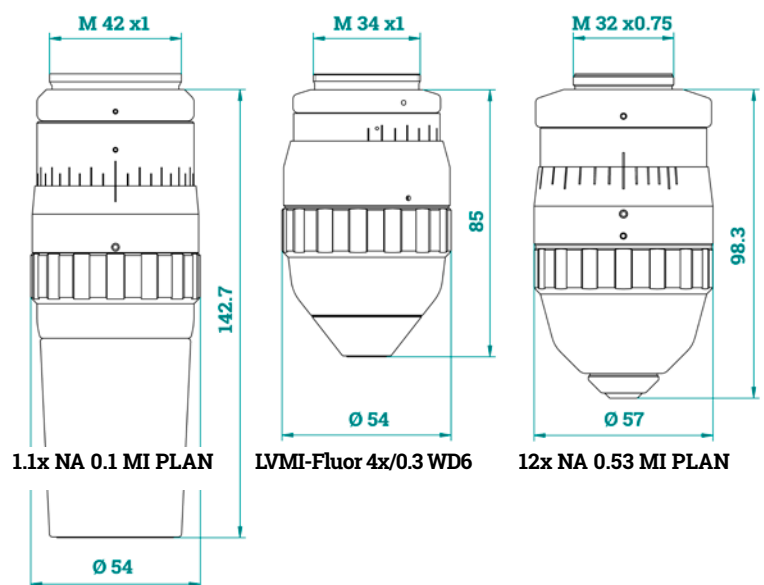
Figure 2: Three-dimensional image of a mouse cortex demonstrating the high isotropic resolution of LaVision BioTec's MI PLAN objective lenses.



MI PLAN Series – Specifications

Objective Lens	Magnification	NA	Dipping Cap	RI Range of Imm. Medium	Clearing Method	WD [mm]
1.1x NA 0.1 MI PLAN *	1.1x	0.1	DC40 WD16 AB	1.33 - 1.49	Aqueous buffers, e.g.: CLARITY, CUBIC, ScaleS	16
			DC57 WD17 O	1.50 - 1.57	Organic solvents, e.g.: BABB, DBE, DISCO, ECI	17
LVMI-Fluor 4x/0.3 WD6	4x	0.3	-	1.33 - 1.57	Aqueous buffers, Organic solvents	5.6
12x NA 0.53 MI PLAN *	12x	0.53	DC33 WD8.5 W	1.33 - 1.41	Aqueous buffers	8.5
			DC49 WD10.9 AB	1.42 - 1.48	Aqueous buffers, e.g.: CLARITY, CUBIC, ScaleS	10.9
			DC57 WD10 O	1.49 - 1.57	Organic solvents, e.g.: BABB, DBE, DISCO, ECI	10

* Each 1.1x and 12x MI PLAN objective lens is delivered with one specific dipping cap. The dipping caps are also available separately and can easily be exchanged. Additional dipping caps not shown in this table are available by agreement.



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