

Application Note: Using Meniscus Lenses

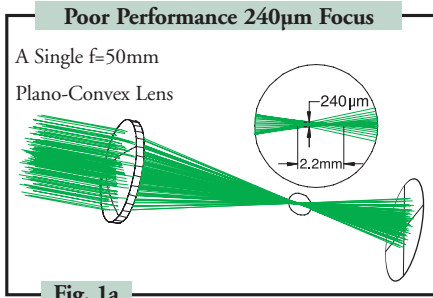


Fig. 1a

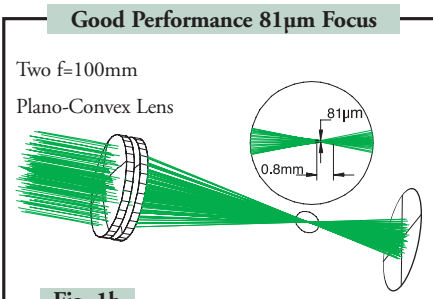


Fig. 1b

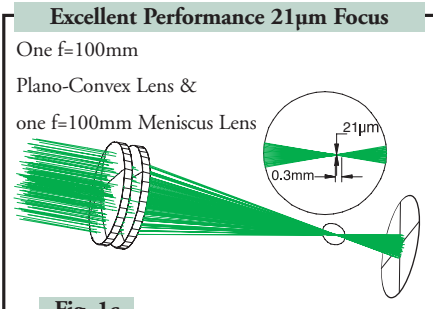


Fig. 1c

- Achieve Tighter Focusing by Combining a Meniscus Lens With Plano-Convex Lenses
- Build Multi-Element Lens Systems to Achieve Higher NA Without Significant Increases in Aberrations

These figures illustrate the performance gains that can be achieved by using multi-element imaging systems. The combination of a meniscus lens and a plano-convex lens yields a 21µm focused spot versus a 240µm spot from the single plano-convex lens.

POSITIVE MENISCUS LENSES

Positive meniscus lenses are designed to minimize spherical aberration. They have one surface convex and the other concave. When used in combination with another lens, a positive meniscus lens will shorten the focal length and increase the NA of the system. Figure 1c shows a meniscus lens being used to shorten the focal length of a 100mm focal length plano-convex lens. In addition, the transverse and lateral aberrations are greatly reduced. The convex surface of both lenses should be facing the away from the image.

NEGATIVE MENISCUS LENSES

Negative meniscus lenses are commonly used in beam expanding applications since they increase the divergence of the beam without introducing any significant spherical aberration. Combining a negative meniscus lens with another lens will increase the focal length and decrease the NA of the system.

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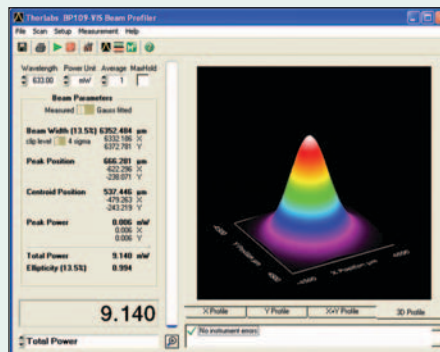
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User software showing pseudo 3D beam profile



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