

Understanding Extended Depth of Focus (EDOF)

Depth of Focus Defined

Depth of focus (DOF) is the range of distance along the visual axis, over which an image may be focused and perceived as a clear image. Simply, it is the range of clear vision. (Figure 1)

Depth of focus (DOF) is relative to the aperture that allows light into the eye. If the aperture is large, the DOF is narrow; if the aperture is small, the DOF is large. (Figure 2)

Extended depth of focus (EDOF) allows uninterrupted visual correction, from near to distance, across a larger range.



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Figure 1

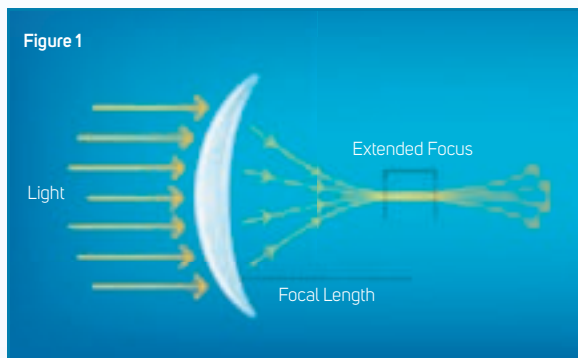
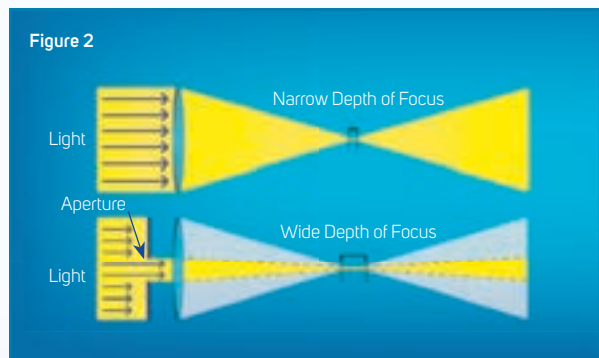


Figure 2



Pinhole Optics – Optics 101

To see an image clearly, light rays must fall on the fovea. Aberrant light rays fall on the retina outside the fovea and on the peripheral retina. These rays are not clear and can cause blur. A pinhole limits aberrant light rays inside the eye. The pinhole, whether an occluder type or 'induced aperture' pinhole, limits the aberrant rays that hit other parts of the retina so that only the light rays coming straight through and directly hitting the fovea enter the eye. This creates a clear image at near, intermediate and distance. The clarity of the image is independent of the distance away from the eye.

These principles will help you better understand the optics behind the NaturalVue® (etafilcon A) Multifocal 1 Day Contact Lens design.¹

The NaturalVue® Multifocal uses the principle of pinhole optics in its design. The distance power is focused in the center of the lens. The plus power increases rapidly, smoothly, continuously out from the center. The brain and the visual cortex suppress the power it does not need. These high amounts of plus are enough to induce the 'peripheral blur', which creates a virtual aperture or 'pinhole' effect. This effect results in an extended depth of focus and clear range of vision. The Neurofocus Optics® technology makes this lens very different from most designs on the market today.

The NaturalVue® Multifocal:

- Provides clear distance, intermediate, and near vision with spectacle-level visual acuity and stereoacuity²
- Creates an effective ADD up to +3.00D for a simplified fit²
- Is available in 0.25D steps from +4.00D to -12.25D

For additional information, please contact Dr. Peg Achenbach at pachenbach@vtivision.com or VTI Technical Consultation at 1-844-VTIVISION (1-844-884-5367) ext. 102, or TechnicalConsultation@vtivision.com.

1. Patents Awarded – MULTIFOCAL OPHTHALMIC LENS WITH INDUCED APERTURE, See <https://vtivision.com/about/patents/> for details.
2. VTI data on file 2015. N=59. Data assessed after 1 week of wear.