AGILE FOCUS
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PoweRave™ mirrors

Varifocal Component

PRE-RELEASE UNIT

FAST VARIFOCAL MIRRORS REMAIN STATIONARY WHILE QUICKLY ALTERING THEIR FOCAL LENGTH.

Metal coated variable focus mirrors with 5 or 10-mm nominal diameters provide fast and flexible focusing for imaging and laser systems with applications including microscopy, machine vision, automation, and ranging. The mirrors consist of four concentric electrodes for aberration correction*, or all four electrodes can be shorted together for simple deformation of the mirror surface. The mirrors demonstrate speed, large deformations, and a large clear aperture, all in a versatile and compact form-factor.

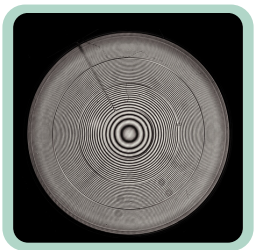
Features:

- Allows focus changes without moving the sample
- Provides four concentric electrodes for aberration correction (requires end-user implementation)
- Driver and software for basic focus control sold separately or as a kit

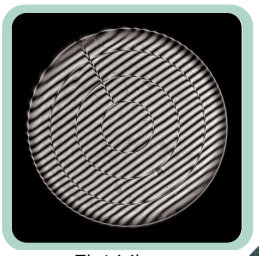
Custom Options:

- Gold or aluminum surfaces
- Mirror diameter (standard 5 & 10 mm)
- Faster bandwidth
- Smaller or larger focus range
- Number of electrodes

Clear Aperture	5 or 10 mm
Focal Range	∞ ~ 70 mm, ∞ ~ 400 mm
Bandwidth	up to 350 Hz
Electrode #	4



Deflected Mirror (19 µm)



Flat Mirror

* Please note that the driver does not ship with standard aberration control, Users must program and develop their own parameters for proper correction.

Warning

The driver, connecting wires, and device enclosure operate at a hazardous voltage. Opening the packaging negates any warranty or service.

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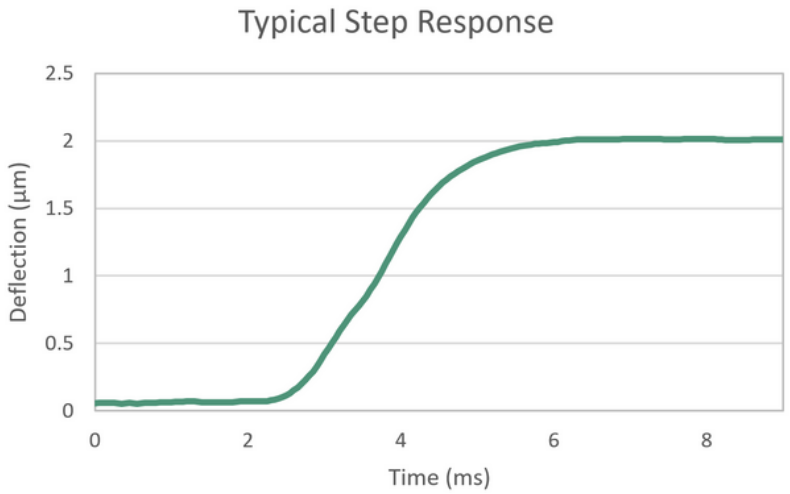
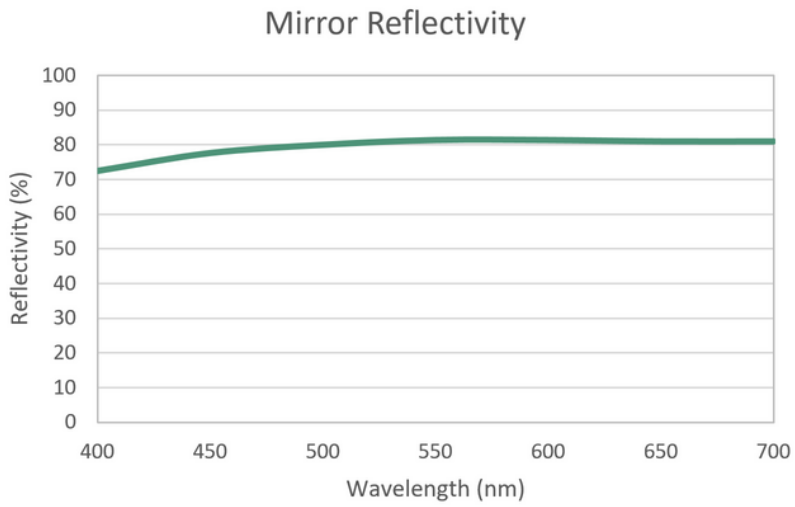
*note that design is subject to change

SPECIFICATIONS

Reflectivity	~ 80%
Settling Time	2.1 ms
Max. Rated Deflection	21 (5-mm) or 32 (10-mm) µm
Mirror Coating	Aluminum
Mirror Flatness	< 200 nm (peak-to-valley)
Dimensions | Threading	Ø45 mm X 16 mm | M6 x 1 or 1/4-20
Required Spatial Filtering*	0.76˚ ~ 1.34˚ (for visible, 400 nm - 700 nm)

*The mirror surface has a pattern of radial vias spaced with a period of 30 µm. The first order diffraction angle can be approximated by $\Phi_1 \approx \lambda/30000\ \mathrm{nm}$.





Disclaimer: Agile Focus Designs does not guarantee the accuracy or completeness of this document and reserves the right to make changes to these specifications at any time without notice. Using high-voltage connectors or wiring not rated for required driving voltages is not recommended and is at the risk of the user. Tampering with or disassembling mirror unit, cables or connectors voids any warranty or service by Agile.

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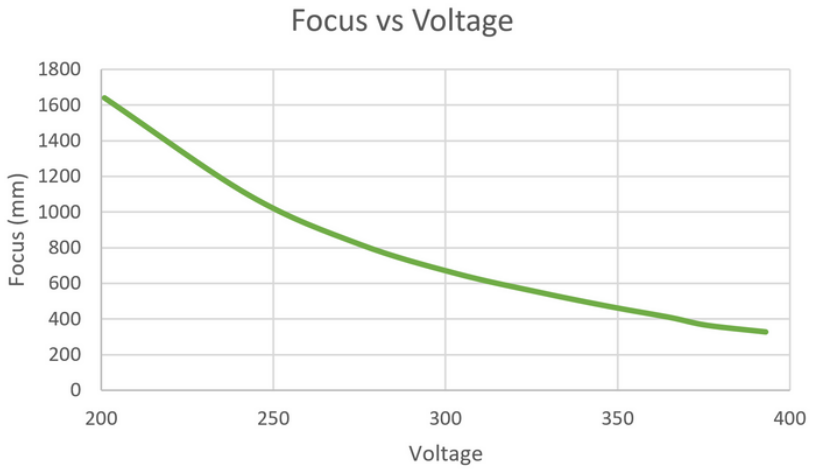
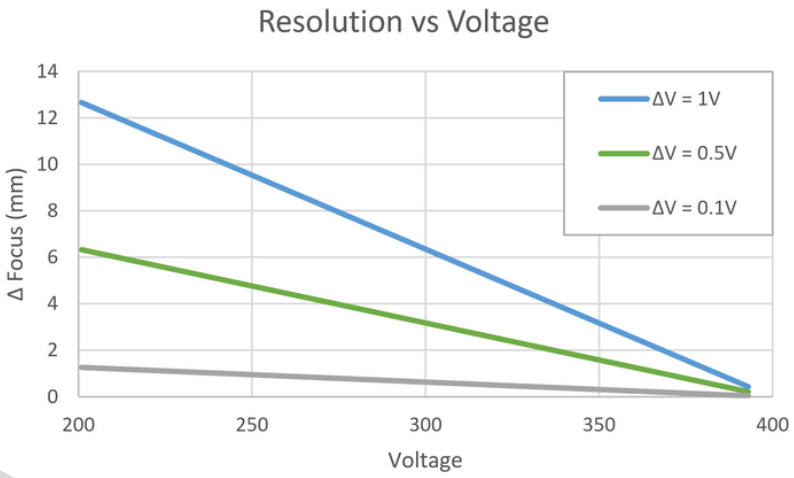
Resolution

The resolution of focal control depends on a number of factors: the two most important being the stability of the electrostatic drive electronics and the current depth of focus. As the focus decreases (and mirror deflection increases), changes to the focus require increasingly larger voltage steps. Below is a representative resolution plot for Agile PoweRave Mirrors at various voltage stabilities. Please Note: Each purchased mirror will be accompanied with calibration data showing focus vs. voltage performance for that particular mirror.





When the varifocal mirror is used with an objective lens, the change in focus, **Δf**, can be related to the mirror focus, **fm**, using the beam radius, **a**, the medium index, **n**, and the **NA** of the lens:

$$\Delta f = \frac{-n \cdot a^2}{f_M \cdot NA^2}$$

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