COMMON IMAGING EQUATION

Imaging Equation

$$PMAG = \frac{h}{FOV} \qquad AFOV(°) = 2 \cdot \tan^{-1}\left[\frac{h}{2 \cdot f}\right]$$

$$FOV = h \cdot \left[\frac{WD}{f} - 1\right]$$

$$f/\# \ working = [\ 1 + PMAG\ ] \cdot f/\#$$

$$f/\# \ Image\ Space = \frac{1}{2 \cdot NA} \qquad NA\ Image\ Space = \frac{1}{2 \cdot f/\#}$$

$$NA\ Object\ Space = n \cdot \sin[\alpha]$$

$$Resolution_{Image\ Space}\ (lp/mm) = \frac{500\mu m/mm}{pixel\ size\ (\mu m)}$$

$$Resolution_{Object\ Space} = \frac{pixel\ size\ (\mu m)}{system\ PMAG}$$

$$Minimum\ Spot\ Size\ (\mu m) = 2.44 \cdot \lambda\ (\mu m) \cdot f/\#$$

$$Cutoff\ Frequency\ (lp/mm) = \frac{1000\mu m/mm}{f/\# \cdot \lambda}$$

$$\varepsilon = 0.61 \cdot \frac{\lambda}{NA}$$

Variable

n = Index of Refraction
FOV = Field of View
WD = Working Distance
λ = Wavelength
h = Sensor Size
ε = Resolving Power

f = Focal Length
AFOV = Angular Field of View
NA = Numerical Aperture
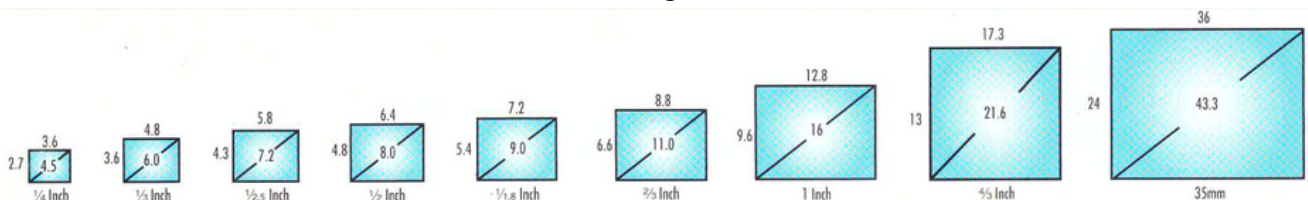PMAG = Primary Magnifcation
α = Marginal Ray

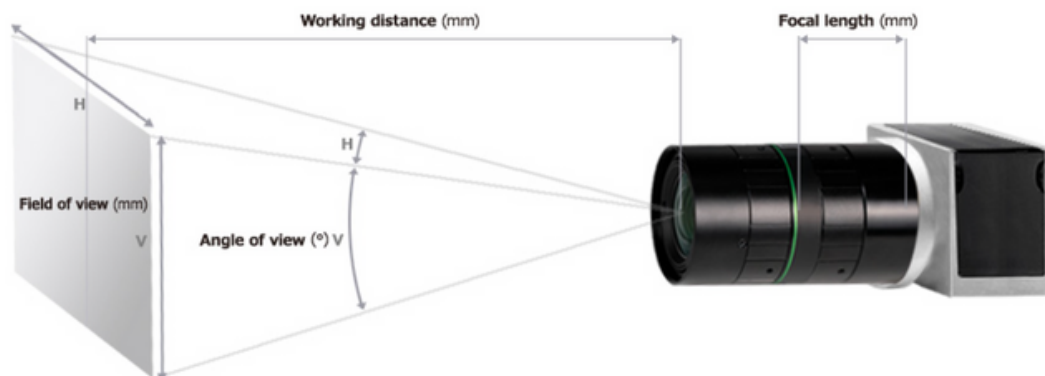*All units are in mm unless stated otherwise*

Lens Anatomy

Common Industry Sensor Format

Format Position Allocation

Calculator Link: https://optics.fujifilm.com/mvlens/en/selector/

PRIMARY & **COMPLEMENTARY**
COLOR WHEEL