VERTEX OPTICS · In Spec & On Time!

A Sydor Optics Company

Optical Manufacturing Tolerance Chart	
Attribute	**Manufacturing Limits**
Diameter	+0.000/-0.010 mm ±
Center Thickness	0.010 mm
Sag	±0.010 mm
Clear Aperture*	Up to 99%
Radius (larger of two)	±0.025% or 1 fringe
Irregularity – **Interferometer**	0.05 waves PV
Irregularity – **Profilometer**	1 fringe PV
Irregularity – **CMM**	±1 micron PV
Wedge, ETD	0.001 mm
Scratch Dig (ISO 10110-7:2017) (Mil-Spec 13830B)	10-5
Surface Roughness**	5 Å rms
Domes Concentricity	5 microns

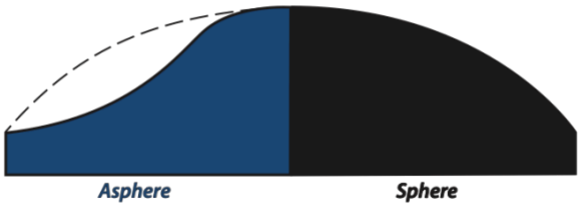
(Larger sizes and tighter tolerances available)

* Standard clear aperture 90%

** Aspheres are 20 Å rms

Contact: sales@vertexoptics.com for more information.

An aspheric lens is a type of lens whose surface profiles are not portions of a sphere or cylinder. Unlike traditional spherical lenses, aspheric lenses have a more complex surface profile that gradually changes curvature from the center to the edge. Most axial symmetric aspheres are defined by the following equation:



$$z = \frac{cS^2}{1+[1-(K+1)c^2S^2]^{1/2}} + A_1S^4 + A_2S^6 + A_3S^8 + A_4S^{10},$$

z is the height change (or sag), *S* is the distance from the center of the optic, *c* (or curvature) is equal to 1/ radius of curvature, and A_1, A_2, A_3, etc. are the aspheric deformation constants.

Where the conic constant (*K*) changes to produce the following shapes:

Hyperbola $K < -1$, **Parabola** $K = -1$, **Ellipse** $-1 < K < 0$, **Sphere** $K = 0$, **Oblate Spheroid** $K > 0$

Note: If both K and A_1 are zero, the equation represents a spherical surface.