

## Turbulence Phase Plates

Lexitek's Turbulence Phase Plates are a unique product for adaptive optics (AO) systems engineering. Since wavefront sensor and deformable mirror degrees of freedom are expensive, most systems operate in a regime where system performance is a sensitive function of the wavefront aberration, especially for atmospheric propagation. The most accurate way to engineer, test and validate AO system performance is with well-characterized wavefront aberrators in the laboratory. Lexitek's Near-Index-Match™ pseudo-random phase plates offer that capability to the AO system engineer. Multiple phase plates with varying strengths can simulate distributed turbulent layers, each with its own pseudo-wind.

Phase plates are made of a sandwich of CNC machined acrylic and cast optical polymer. The surface is machined with the design optical path difference (OPD) scaled by  $1/\Delta n$ . Optical windows with AR coatings are typically bonded to the sandwich for improved surface quality and parallelism.

### **SPECIFICATIONS**

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- Transmission from 400-1600 nm
- Dimensions to 300x150mm, 150mm diameter
- Continuous phase surfaces machined with ball end mill, typically 1/32" diameter
- Discontinuous phases with flat end mill
- Surface height step 1.2  $\mu\text{m}$ , 5  $\mu\text{m}$  accurate
- $\Delta n$  range 0.01-0.05
- Phase specified by numerical array provided by the customer or designed by Lexitek to your specifications (e.g.,  $r_0$  in mm)
- Unique phase for each part at no extra charge

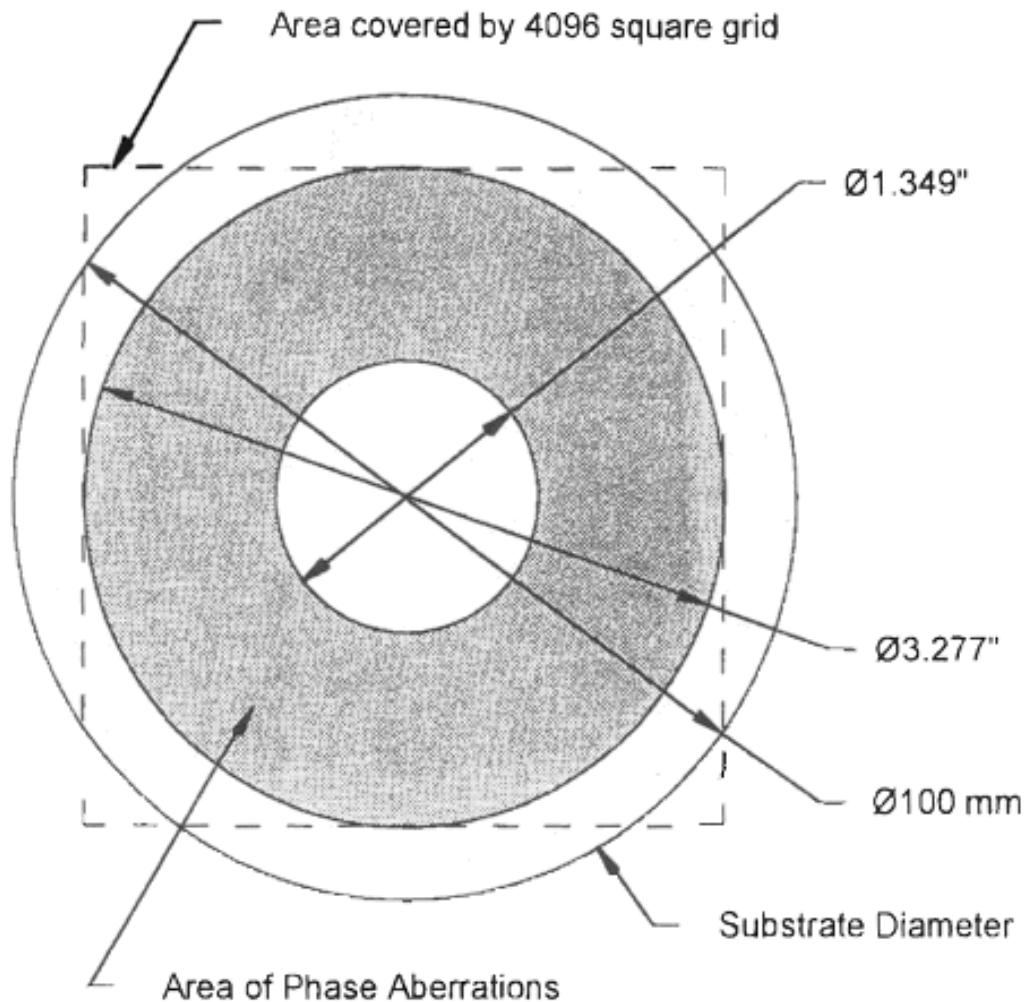
### **TYPICAL PARAMETERS**

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- Continuous surface with BK7 windows
- 100 mm diameter, 83 mm active area
- 22 mm thickness
- 4096x4096 phase array
- ~20  $\mu\text{m}$  phase grid
- $\lambda/10$  external surfaces
- Broadband AR coating <0.6% reflection
- 15 arcsec parallelism, 30 arcsec max
- OPD step 0.02  $\mu\text{m}$ , 0.09  $\mu\text{m}$  accurate
- OPD range 5-30  $\mu\text{m}$  (min-max)

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## Geometry of a standard 100 mm diameter phase plate.

Lexitek has supplied turbulence phase plates to university researchers, aerospace companies, and government laboratories. Typical turnaround from receipt of order to shipment is 4-6 weeks.

Related products: LS-100 Motorized Rotary Stage, Stepper Motor Controller

Please consult us if your requirements call for different specifications or if you need custom engineering of this product or related products.

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