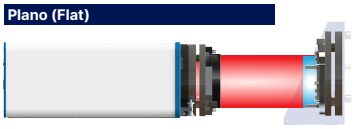
Common Optical Testing Setups

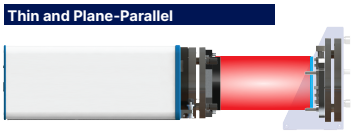
PLANO SURFACE ERROR

Plano (Flat)



- Surface quality of flat optics from several to hundreds of mm diameter
- Mirrors, windows, wafers, discs, seals, and polished metal or glass

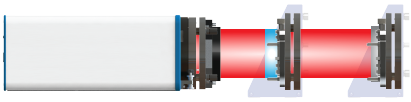
Thin and Plane-Parallel



- Front and back surface quality and optical thickness of plane-parallel optics
- Windows, reticles, glass disks, and glass, sapphire, or wafer substrates

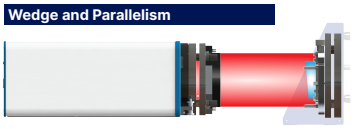
PLANO TRANSMITTED WAVEFRONT ERROR

Plano TWE



- TWE of flat optics and transparent materials
- Windows, reticles, and filter substrates

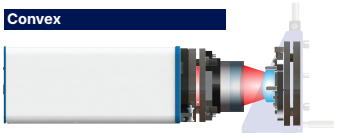
Wedge and Parallelism



- Surface parallelism
- Windows, reticles, glass discs, domes, and glass, sapphire, or wafer substrates

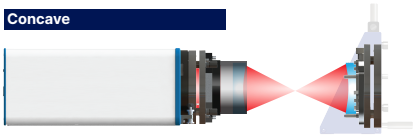
CURVED SURFACE ERROR

Convex



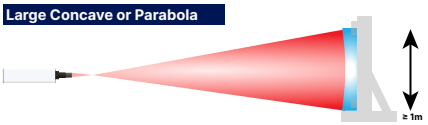
- Convex surface quality
- Lenses, mirrors, domes, and telescope secondary optics

Concave



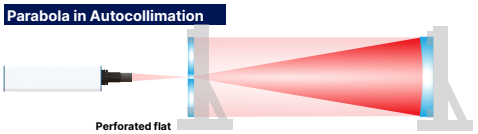
- Concave surface quality
- Lenses, mirrors, off-axis parabolas, and telescope optics

Large Concave or Parabola



- Concave surface quality of meter-class optics
- Long measurement paths
- Ground- and space-based telescope optics

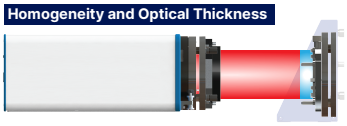
Parabola in Autocollimation



- Large optical surfaces
- Off-axis and fast parabolas
- Long cavity measurements
- Astronomical and aerospace telescope optics

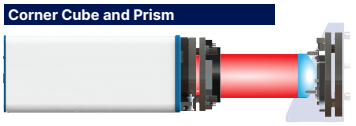
OTHER PLANO WAVEFRONT MEASUREMENTS

Homogeneity and Optical Thickness



- Optical thickness and homogeneity
- Windows, thin glass disks, and glass or sapphire substrates

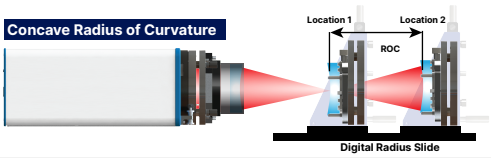
Corner Cube and Prism



- Surface quality of faces
- Dihedral angles and retroreflection errors
- Single or double pass TWE
- Solid, hollow, and porro prisms

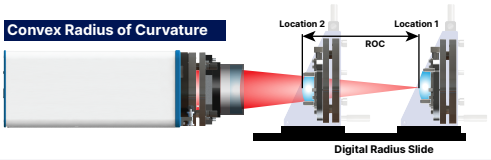
RADIUS OF CURVATURE

Concave Radius of Curvature



- Measure ROC with precision digital radius slide
- Lenses, mirrors, and domes

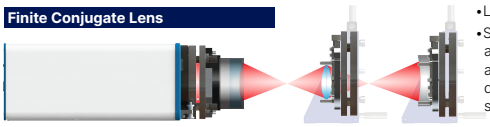
Convex Radius of Curvature



- Measure ROC with precision digital radius slide
- Lenses, mirrors, and domes

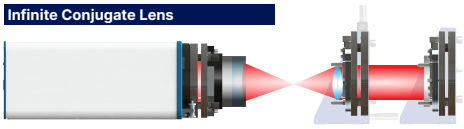
LENSES AND SYSTEM TRANSMITTED WAVEFRONT ERROR

Finite Conjugate Lens



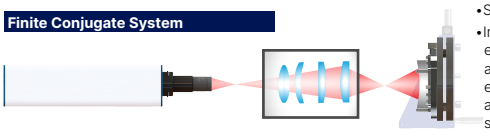
- Lens TWE
- Singlet, doublet, triplet, and achromatic lenses, and compound lenses with diffractive or aspheric surfaces

Infinite Conjugate Lens



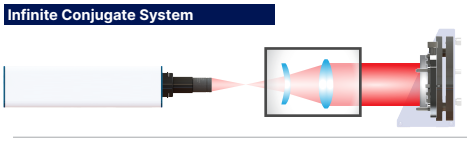
- Lens TWE of lenses
- Singlet, doublet, triplet, tube, and achromatic lenses, and compound lenses with diffractive or aspheric surfaces

Finite Conjugate System



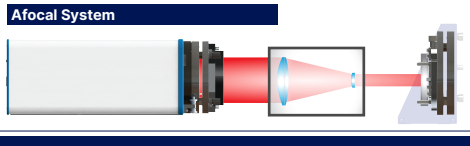
- System TWE
- Image relays, beam expanders, binoculars, and telescopes, multi-element lens assemblies and aerospace optical systems

Infinite Conjugate System



- System TWE
- Imaging, zoom, and camera lenses, multi-element lens assemblies, image relays, microscope objectives, and refractive telescope objectives

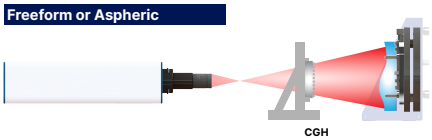
Afocal System



- Measure TWE of systems
- Image relays, beam expanders, binoculars, and telescopes, multi-element lens assemblies, aerospace optical systems

FREEFORM SURFACE ERROR

Freeform or Aspheric



- Non-spherical surfaces
- Small to meter-class mirrors
- AR/VR optics, off-axis parabolas, telescope optics, illumination systems, and compound complex shapes

The 4D Family of Interferometers

PhaseCam Twyman-Green
Vibration-insensitive Dynamic
Visible through LWIR wavelengths
Fully on-axis design
Best for large concave optics and systems

AccuFiz Fizeau
Temporal or Dynamic Interferometry
Apertures to 600 mm
Visible and IR wavelengths
Best for flats, spheres, aspheres, ROC, large flat optics, plano TWE measurement

AccuFiz D Fizeau
Short Coherence Source
Dynamic Interferometry, fully on-axis
Apertures to 600 mm
Visible and NIR wavelengths
Best for plane-parallel optics, domes

● Recommended ● Alternative

Click the setups for online details, required equipment, and alternative methods

View the online Optical Setups Guide at https://4dtechnology.com/optical-setups

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