

Model OS400-10 | Lens Bench



Overview

- The OS-400-10 is a **manual** bench, designed for testing relatively **large** lenses at **infinite** conjugates. The optical path consists of a collimator, the lens under test, and a microscope to view the image.
- For lenses with focal length up to 200 mm the bench is usually set up as shown above. For lenses with long focal length or large chief ray angle, the OS-400-10 can also be set up as a “Nodal bench.” In that configuration the lens pivots, while the microscope remains fixed.

Tests Performed

- On & Off-axis image quality
 - MTF
 - Numerical measurement of 3-bar contrast
 - Enslitted energy
 - Star test
- EFL
- Distortion
- Field Curvature
- Chief ray angle
- Relative Illumination
- Veiling glare (relative)

Test Lens Range

- EFL Range: 5 mm < EFL < 1,500 mm for positive lenses
- F/Number, NA: F 1.25 / NA 0.4, limited by microscope lens
- Field of View: +/- 90 degrees
- Clear Aperture: 80 mm standard. 100 mm and 48 mm option
- Weight/Size: up to ~2 kg with supplied lens holder

Illumination Sources

- Five LED Sources spanning 400 - 780 nm
- "White" LED
- Photopic source (White LED plus filter)

Options

- Mounting options: optical bench or linear rail
- Larger and smaller collimators (100 mm clear aperture standard, 80 mm and 45 mm CA collimators available as option)
- Halogen source

Parts List

Optical rail

- 2 meter extruded aluminum optical rail
- Pneumatic anti-vibration foot kit

Collimator body

- Body with diffraction limited achromatic objective lens
 - 80 mm CA standard. 100 mm and 48 mm options
- Reticle holder with condenser optics
- Mounting stand to attach collimator to optical rail

Light source

- Dual port integrating sphere, with ports for LED and fiber bundle
- Kit for 5 single color LED's + white LED, White LED with photopic filter
- 100:1 DC current source with universal AC input

Lens mount with universal 4.75 inch disk

- U-mount base with +/- 3 mm Y adjustment
- Two universal lens disks with ThorLabs® SM1 thread
 - SM1 adaptors for RMS, C-Mount, M-12
- Kit of 2 blank disks with pilot hole for custom mounts
- Disk with 3-arm chuck, SM2 thread on thru-hole
- SM2 riser to allow testing very wide angle lenses

Video microscope

- Microscope lens for high NA lenses (20X @ 0.4NA)
- Microscope lens for low NA lenses (4X @ 0.1NA)
- 100 mm tube lens
- Monochrome CCD camera with 1280 X 960 resolution
- Kinematic breakaway mount for X-Z stage

Pivot table

- "Mushroom" pivot assembly with +/- 90 degree motion

Measurement Accuracy

- MTF accuracy 2% MTF at 200 lines / mm at F8
- MTF Repeatability: 1% MTF typical
- EFL / magnification Repeatability: 1:5000

X-Z stage for microscope

- Cross roller Z stage with 25 mm travel.
- Rack-and pinion cross-axis stage with 40 mm travel
- "Breakaway" magnetic kinematic mount for microscope
- Optional 1 um digital readout on Z axis, 10 um readout on X

Reticle kit

- USAF reticle
- 1, 2 and 4 mm "box target" for MTF / EFL measurement
- Cross reticle with no AR coating (for alignment)
- Veiling glare target

Calibration kit / Reference lens

- 400 mm F/8 reference lens with Zygo certificate
- Direct view, back-lit reticle for microscope calibration

Computer and software

- OpticStudio software on CD
- Laptop computer with software preinstalled
- USB "dongle," required to run software

Support

- 2 year warranty
- Perpetual software license
- 2 year software maintenance and support