Optical assembly alignment and angle inspection plan

optical-alignment

SHANGHAI MICROCRE OPTICS-MECH TECH CO.,LTD

Telephone: 400-812-7833 | 021-58391850

Address: 1478 Nanfeng Road, Fengcheng Town, Fengxian District, Shanghai, China | Postal code: 201411

Contact email: shanghai@yr17.net

Service email: rockwei@yr17.net

Application template; not a claim of a completed customer project.

Scope

For directional adjustment of mirrors, optical platforms and optomechanical mounts. Establish a traceable direction before comparing relative angles.

Equipment and configuration guidance

• Autocollimator or angle system with a suitable range

• Reflectors, adjustment mounts and calibrated angular references

• Stable mounting platform and stray-light control

Principle and calculation

The indicated autocollimator angle usually represents mirror tilt; the reflected ray changes by twice that angle. Do not divide an already converted mirror-angle reading by two again.

On-site checklist

• Reference normal linked to the functional axis

• Main and stray reflections distinguished

• Locking shift and repeatability recorded

Suggested records

• Direction and mounting definition

• Angular adjustment records

• Locking stability and verification needs

Limitations

Angular alignment does not establish image quality, wavefront, focal length or all mechanical coaxiality requirements.

Detailed teaching example

Teaching plan for mirror adjustment, locking and mirror-angle definition

Scenario and task

Teaching demonstration, not a real customer project. All data are constructed examples. An adjustable mirror illustrates autocollimator readings, locking shift and reflected-ray angle. The example assumes the display is already converted to mirror tilt; confirm this definition in the actual instrument documentation first.

Workflow overview

Confirm angle definition → Main return and zero → Adjust and record → Lock and reread → Report mirror and ray angles

Preparation and measurement steps

01. Define the relation between mirror normal and functional optical axis, select one angular component, and confirm whether the display gives mirror tilt or raw ray deflection; record units and sign.

02. Establish the reference zero, identify the principal return and reject stray reflections; retain the initial unadjusted reading and mounting state.

03. Adjust in small steps under the mount procedure, settle and record the residual before final locking; brightness alone is not evidence of zero direction error.

04. Follow the specified locking procedure and reread, comparing before and after; if needed repeat the complete adjustment-and-locking sequence rather than loosening only one clamp.

05. Report the final locked mirror direction and explain its corresponding reflected-ray deflection; verify decentring, focal length, wavefront and image quality separately.

Teaching example readings

• All displayed values are mirror angles: initial +2.40″; adjusted +0.15″; locked +0.40″.

• Mirror-angle locking shift: +0.40−0.15=+0.25″.

• Final mirror offset +0.40″ corresponds to ideal reflected-ray deflection +0.80″ from nominal.

Calculation procedure

The instrument already reports mirror tilt; do not divide by two again. $\Delta\theta_{lock}=0.40-0.15=0.25''$; for ideal plane reflection, ray deflection $\Delta\varphi=2\theta=2\times0.40=0.80''$.

Example result and interpretation

Report final mirror residual +0.40″ and locking shift +0.25″. The +0.80″ ray deflection is derived from ideal reflection geometry, not an independent measurement or a statement of complete image quality.

Example verification checklist

• Confirm the reading definition before applying the factor of two; do not double-convert.

• If locking changes contact, verify the final state rather than delivering only the best unlocked reading.

• Check and record reference-normal relation, mirror form, beam footprint and stray returns as separate influences.

Document generated: 2026-11-16