



CVI Melles Griot shear plate collimation testers can be used to set the divergence or convergence of a laser collimating system to less than 20 μrad (full angle). These testers can also be used to measure wavefront radius of curvature, determine wavefront symmetry, and measure the power of long-focal-length optics.

- Testers can be used at all wavelengths in the visible spectrum.
- They test collimation at beam diameters from 5 to 85 mm.
- Both $\frac{1}{4}$ -20 and M6 threaded mounting holes are included.

Each shear-plate module consists of a wedged, uncoated optical flat mounted in a black aluminum cube complete with a high-visibility viewing screen and a collimation reference line. To collimate an expanded laser beam, the tester is inserted in the beam and the collimator is adjusted until the fringes observed on the screen are parallel to the reference line. All CVI Melles Griot shear-plate modules follow the same sign convention: a convergent beam produces a clockwise rotation of the fringes on the screen relative to the reference line, whereas a divergent beam produces a counterclockwise rotation (see application note). The high-visibility viewing screen makes it unnecessary to use low ambient lighting to observe the fringes. These shear plates can be used at any wavelength within the visible spectrum.

Shear-Plate Collimation Testers

APPLICATION NOTE

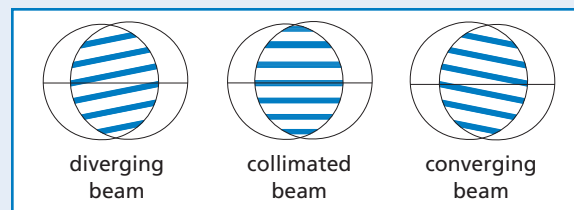
Shear-Plate Theory

A shear plate is a very simple interferometer; in other words, it is an optical arrangement that combines two wavefronts. Constructive and destructive interference between the two wavefronts leads to a series of light and dark fringes which correspond to in-phase and out-of-phase portions of the wavefronts.

Shear plates are thick, high-quality optical flats.

The wavefront or beam to be tested is incident on the shear plate at a 45-degree angle for maximum sensitivity. The uncoated front and rear surfaces generate reflections of almost equal intensity.

These reflected wavefronts are said to be “laterally sheared” (i.e., offset with respect to each other) because of the finite thickness of the plate. Interference occurs in the region where the wavefronts overlap.



Shear-Plate Collimation Testers

Clear Aperture (mm)	Minimum Usable Beam Diameter (mm)	Fringe Rotation Sensitivity* ($\pm 2\%$) (μrad)	Typical**		PART NUMBER
			Collimation Resolution (μrad)	Housing Dimensions (mm)	
25	5	656	218	44.5 × 44.5 × 53.8	09 SPM 001
50	10	230	76	76.2 × 76.2 × 89.2	09 SPM 003
85	15	50	17	127.0 × 127.0 × 142.2	09 SPM 005

*Defined as full-angle beam divergence or convergence corresponding to a 10-degree fringe rotation from collimation at 632.8 nm and at full aperture.

**Operator-dependent.