ALL OPTICAL PROPERTIES ARE FOR CO2 LASER
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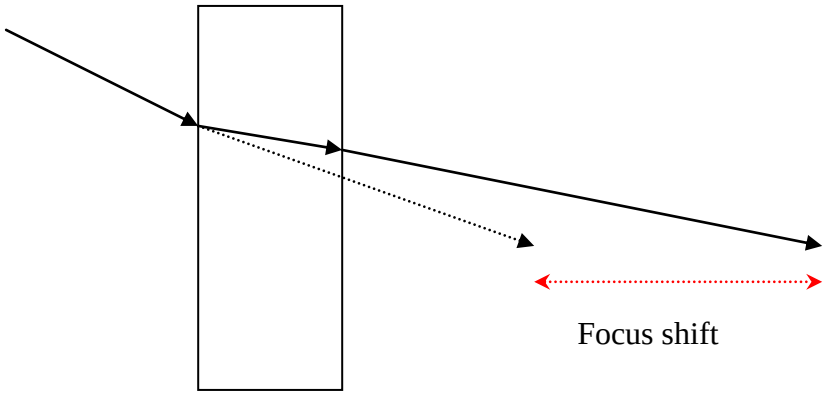
Lenspressure.exe.

The programme assumes the lens is mounted properly, free from external clamp forces heating effects, pressure surges etc.

A safety factor of 4 allows a high degree of confidence that the lens will not rupture. A safety factor of 2 could be used in situations where the lens is carefully mounted, gas pressure is controlled, perhaps in laboratory situations.

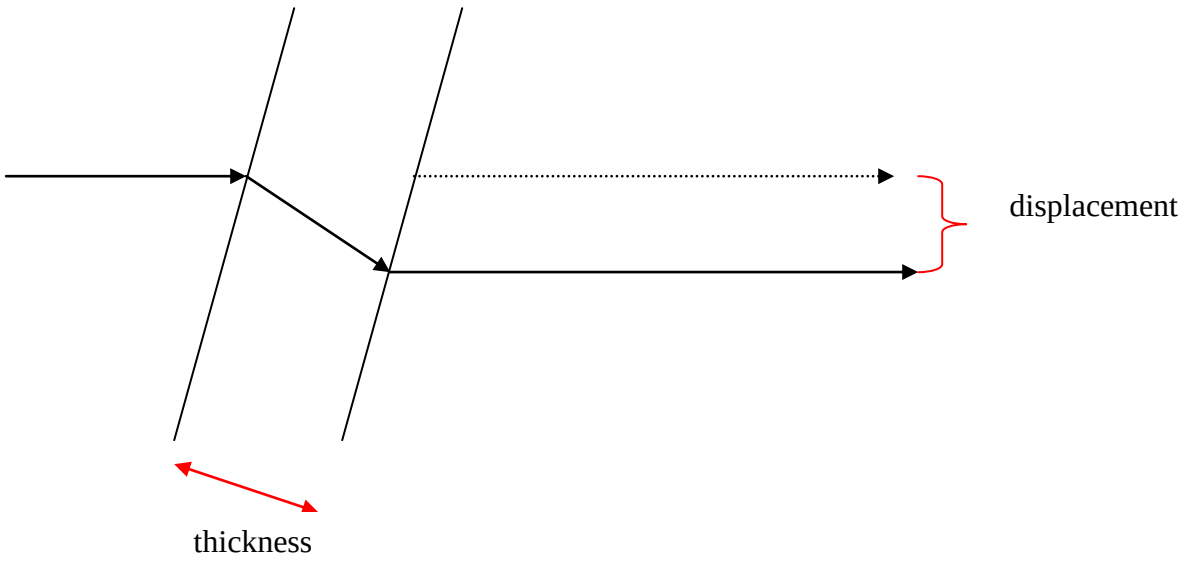
Focusshift.exe



Calculates the effect of a protective window placed after a lens. Enter the windows thickness and the focus shift is given.

Parallelplate.exe.

Calculates the lateral displacement when a parallel plate is used in a beam. Perhaps a beam splitter or Brewster window for example.

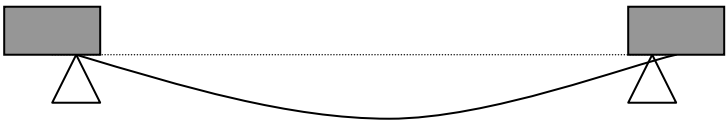


Deflection.exe

When a flat circular plate such as an output window or pressure window has a pressure across it there is a tendency for the window to bow. For optical purposes the deviation of the centre of the plate should be less than .2 microns or much less for demanding applications if it is to remain flat.

Two cases are considered first with the edge supported

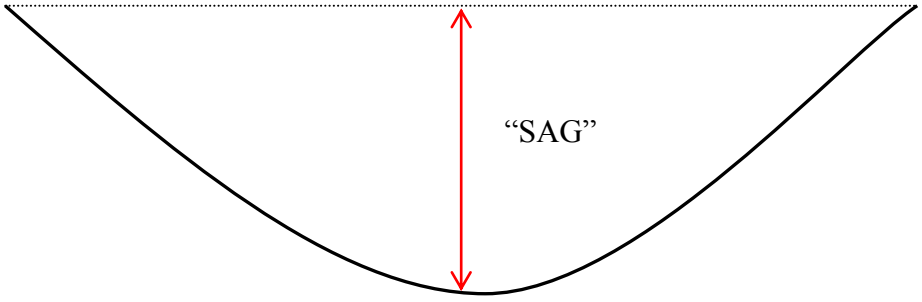
Secondly with edges clamped



Sphere.exe

Optical manufacturers test curved optics by measuring the sagitta (or “sag”) of a surface. This is generally done with interferometry but can be done mechanically.

It is normal for the sag of an optic to be correct to within a certain distance, say for this example 0.316 microns. Optical designers, and manufacturers always like to refer to optical measurements as a proportion of the wavelength being used. So for a HeNe laser frequently used in testing 0.315 microns is one half of a wavelength. In most interferometry one half wavelength appears as a black white transition called a “fringe”. So when the “sag” of a curve is the correct size to within half a wavelength it is said to be correct to “one fringe” or one half wavelength or sometimes lambda/2. Depending on the application a curved surface correct to 2-3 fringes is a good standard. This programme shows how much a fringe or two accuracy is in terms of the Radius Of Curvature. Note the case of optics with small diameters say 25mm and large radius of curvatures say 30 Metres. Here a highly accurate optic made to 1 fringe accuracy can still be 3 or 4 metres away from the notional 30 metre radius.



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