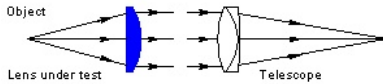


Test configuration supported by OS210B

TESTING A LENS "IN PROJECTION"



A general purpose configuration that is especially useful when the lens to be tested has a high NA

The image source is a back-lit reticle, and a telescope is used to view the image

Limits on the back-lit reticle

It is usually desirable for the light source behind the reticle to have an NA at least as large as the lens under test.¹ The back-lit reticle supplied with the OS200 fills a cone angle of NA 0.5. (F1) with very good uniformity.

Limits on the telescope

- (1) The CA of the telescope should be at least as large as the exit CA of the lens under test. As always, good practice suggests allowing some margin too.
- (2) The CA of the lens under test should be no smaller than 1/10 of the telescope CA. Otherwise long exposure times may be required

For example the 200 mm telescope has a CA of 23 mm, which suggests it is appropriate for lenses with CA between 2 mm and 20 mm.

- (3) In the case of very fast lenses there is a third requirement. The magnification from reticle to CCD should be no larger than 50X. Or, to say it differently, the EFL of the lens under test should be no smaller than 1/50 of the telescope EFL.

Discussion:

Magnification larger than 50X is not so much an optical problem, but one of operator convenience. With very high magnification only a small part of the reticle will be visible².

Too many rules? Please consult the chart below:

Telescope focal length (mm)	Telescope clear aperture (mm)	Largest suggested lens CA	Smallest suggested lens CA	Smallest suggested lens EFL
18	9	6	0.5	0.5
45	9	6	1	1
100	16	10	2	2
200	22	20	2	4
400	48	40	4	8
900	100	95	8	18

¹ Please see footnote 2

² For example, consider an F1.5 lens with 3 mm EFL. The CA is 2 mm, which should be OK for use with a 200 collimator. However, at 66X the magnification is so high that this setup is probably not a good choice. The horizontal field of view will be only [4.8 mm / 66] 72 microns. This is so small that it will be rather difficult for the operator.