

f- Stop -vs- Bellows Extension 790 mm *f*:5.4 Simple Lens

ULF Wollaston Meniscus Lens

Using Aperture Cards (Waterhouse Stops) with a simple (single element) lens for portrait and close-up photography.

Unobstructed Lens Dia.- 145 (mm Ø) focus @ Infinity focus @ 10' (3m) focus @ 60" (1.5m)
Actual bellows draw (Lens-to-Film, mm) --- 790 1000 1400
Actual bellows draw (inches) ----- 31.1 39.4 55.1

Standard <i>f</i> #'s	Aperture Ø	Equivalent <i>f</i> #	Equivalent <i>f</i> #	Equivalent <i>f</i> #
Wide open	145 mm Ø	5.4	6.9	9.7
<i>f</i> 6.3	6 125 mm Ø	6.3	8.0	11.2
<i>f</i> 6.7	118 mm Ø	6.7	8.5	11.9
<i>f</i> 8	99 mm Ø	8.0	10.1	14.2
<i>f</i> 9.5	83 mm Ø	9.5	12.0	16.8
<i>f</i> 11	72 mm Ø	11.0	13.9	19.5
<i>f</i> 13.5	59 mm Ø	13.5	17.1	23.9
<i>f</i> 16	# 49 mm Ø	16.0	20.3	28.4
<i>f</i> 22	# 36 mm Ø	22.0	27.8	39.0
<i>f</i> 32	# 25 mm Ø	32.0	40.5	56.7

11x14 Format field of view: ?? ??
16x20 Format field of view: ?? ??
20x24 Format field of view: ?? ??

The above chart is a simplified method for estimating exposures without applying a "bellows extension factor".
Use with a simple (single element) barrel mounted, fixed diaphragm, shutterless lens.

Basic formula for *f*-stop with a simple lens:

...Divide the *measured* lens to film distance by the aperture diameter, = *f* stop at that *measured* lens to film distance.

Image circle at infinity: About 1425mm (56") diameter

Image circle at 3m (10'/120"): > 1830mm (72") diameter