

F/stops and Shutter Speeds in 1/3rd Stop Increments

<http://www.uscoles.com/fstop.htm>

Shutter Speed Comments	1/	f/	f/stop Comments
Many cameras go to 1/4,000th	2,000	1.0	Extremely rare to find a lens this fast; Leica makes a 50 f/1.0
	1,600	1.1	Some 50 f/1.2s available (f/1.2 is a half-stop, not a third)
	1,250	1.3	
Most older SLRs go to 1/1000th	1,000	1.4	Common in fast 35-50mm lenses; Leica does a 75 f/1.4
	800	1.6	
	640	1.8	Common in 50mm lenses; a fast 85 or 100
Most leaf shutters stop at 1/500th	500	2.0	A slowish 50; a really fast 28 or 300
	400	2.2	
	320	2.5	Nikon's 105 is an f/2.5; they also made an f/1.8
Some old leaf shutters stopped at 1/300th	250	2.8	Common from 20-135mm; a fast zoom lens
	200	3.2	My Rollicord Vb viewing lens is an f/3.2 75mm
	160	3.6	My Nikon 28mm is an f/3.5; this is a bit slow
Typical modern fast flash sync speed	125	4.0	Most zoom lenses start about here; my Nikon 200 is f/4
	100	4.5	Common for regular 300s
	80	5.0	
Typical older SLR flash sync speed (Note that 1/60 isn't quite half of 1/125th)	60	5.7	Generally called f/5.6. It's f/5.6569 if you want to impress
	50	6.3	
	40	7.1	
With a normal lens, you start needing a tripod	30	8.0	Typical of long mirror lenses (500mm+)
	25	9.0	
	20	10.1	
	15	11.3	Generally called f/11. Vivitar did a Series 1 800mm f/11
	12	12.7	
	10	14.3	
(Another discontinuity---not half of 1/15th)	8	16.0	Home of the sunny 16 rule; most 35-50s stop here
	6.4	18.0	
	5.0	20.2	
	4	22.6	Generally called f/22; most wides & teles stop here
My digital camera will say 1/2.5th of a second	3.2	25.4	
	2.5	28.5	
	2	32.0	Common in long lenses, macros & PC lenses

^ - - Opening Up
Stopping Down - - - ^

Slower speeds are available. Most cameras have 1 second; many have 2, 4 and sometimes 8 seconds and the Nikon F2 would do 10 with a mechanical shutter. After that, it's time for the B setting and a stopwatch. Some automatic cameras will set shutter speeds substantially longer than the 1 second limit on automatic. You'll need to try it out somewhere dark with a tripod.

Occasionally lenses go beyond f/32. The full stop sequence is f/45, f/64, f/90, f/125, f/180. By the time you get to f/180 you are in pinhole territory on a 35mm camera. You may find a couple of small stops on view camera lenses. Get yourself a tripod! At the other end of the scale, Canon made a 50mm f/0.95 for their rangefinders in the 1950s.

Note that every combination shown above would be exactly the same exposure. This gets back to the doubling/halving relationships in photography. When you set, say, 1/60th at f/5.6, you could also set 1/4 second at f/22 or 1/1000th at f/1.4.

It's also interesting to note that the film speed sequence follows the shutter speed sequence. I'm not sure if ASA 25 film is even available any more, but starting there and doubling up, you will get 25, 50, 100, 200, 400, 800, 1600, 3200, the common film speeds and also 1/n shutter speeds. These are shown in blue above. Funny that the film speed sequence is one-third stop down from the shutter speed sequence (most shutters have 1/500th, but ASA 400 is a common film speed, and 1/400th is 1/3 stop down from 1/500th). Some of the film speeds fall on third-stop shutter fractions, like Kodachrome 64 or the Fuji and Kodak Professional print films at ASA 160 and 400.

Small Print: Shutter speeds are fractions of a second, so that 500 means 1/500th of a second. Many of the fractions are slightly rounded off. The 1/800th of a second, for instance, would actually calculate to 1/794th and 1/200th would actually be 1/198th. Also, note that the shutter speed sequence has discontinuities at 1/60th and 1/8th, where, for convenience' sake, the actual values of 1/63rd and 1/7.5th are rounded. Oddly enough, in the film speed sequence, ASA 64 is used rather than ASA 60. The lens focal length comments are virtually all for 35mm cameras. On my Mamiya 6, the lenses are bigger and slower, a 75mm f/3.5 normal lens and a 50mm f/4.0 wide angle. A 50 f/4 for a 35mm camera would be very slow; in medium format, it's pretty standard.

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