

Hyperfocal Focusing

How to set the hyperfocal distance for 35 mm cameras with zoom lenses:

1. Choose a lens. A wide angle works best such as 14-35 mm on full frame or 10-24 mm on a crop sensor camera.
2. Choose an f-stop that you want to use and manually focus the lens to the distance shown on the chart.
3. Now the depth of field is from 1/2 the focused distance to infinity.
4. The background and distant subjects will look out of focus in the viewfinder but do not refocus. (Press down & hold the depth of field preview button on your camera to get an idea of what is in focus.)
5. To make sure your images have reasonably good sharpness at the extremes of the depth of field, stop down to a high number f-stop, such as f-16.
6. Example: With a 35 mm lens, set the f-stop at f-22. Then manually focus at 8 feet. Then the depth of field will be from 4 feet (1/2 of 8 feet) to infinity, everything in this range will be reasonably sharp.
7. Keep in mind the point of focus will be the sharpest and everything else will be a bit softer. The background will have relatively good sharpness.

For full frame sensor: Canon 1Ds, 1Ds Mark II, 1Ds Mark III, 5D Mark II, 5D, Nikon D3s, D3, D3x, D700, Sony A900, A850, Leica M9

Lens	F8	F11	F16	F22	F32
14 mm	3.2	2.4	1.6	1.2	.08
15 mm	3.8	2.7	1.9	1.4	.09
16 mm	4.3	3.0	2.1	1.5	1.0
17 mm	4.8	3.5	2.4	1.7	1.2
18 mm	5.5	4.0	2.8	2.0	1.4
19 mm	6.0	4.4	3.0	2.2	1.5
20 mm	7.0	5.0	3.5	2.8	1.7
24 mm	10	7.0	5.0	3.5	2.5
28 mm	13	10	7.0	5.0	4.0
35 mm	20	15	10	8.0	5.0
50 mm	42	30	20	15	10
75 mm	94	68	47	34	24
100 mm	167	122	84	61	42

FOR 1.6 Sensor

Canon Rebel T2i, T1i, XT, XTi, XSi, XS, 7D, 50D, 40D, 30D, 20D, 20Da, 10D, D60, D30 (1000D, 500D, 450D, 350D, 300D)

Lens	F8	F11	F16	F22	F32
14 mm	5.1	3.8	2.6	1.9	0.1
15 mm	6.1	4.3	3.0	2.2	0.1
16 mm	6.9	4.8	3.4	2.4	1.6
17 mm	7.7	5.6	3.8	2.7	1.9
18 mm	8.8	6.4	4.5	3.2	2.2
19 mm	9.6	7.0	4.8	3.5	2.4
20 mm	11.2	8.0	5.6	4.5	2.7
24mm	16.0	11.2	8.0	5.6	4.0
28 mm	20.8	16.0	11.2	8.0	6.4
35 mm	32.0	24.0	16.0	12.8	8.0

FOR 1.5 Sensor					
Nikon D5000, D3000, D300, D300s, D200, D100; D90, D80, D70. D 70s, D40. D 40x (all Nikon except D3, D3x, D700), Fuji, Konica Minolta, Sony (except A900, A850), Pentax, Samsung,					
Lens	F8	F11	F16	F22	F32
14 mm	4.8	3.6	2.4	1.8	0.1
15 mm	5.7	4.1	2.9	2.1	0.1
16 mm	6.5	4.5	3.2	2.3	1.5
17 mm	7.2	5.3	3.6	2.6	1.8
18 mm	8.3	6.0	4.2	3.0	2.1
19 mm	9.0	6.6	4.5	3.3	2.3
20 mm	10.5	7.5	5.3	4.2	2.6
24mm	15.0	10.5	7.5	5.3	3.8
28 mm	19.5	15.0	10.5	7.5	6.0
35 mm	30.0	22.5	15.0	12.0	7.5

For 1.3 Sensor Size: Canon 1D, 1D mark II, 1D mark III, 1D mark IV, Kodak DCS 460. Multiply the lens by 1.3 for the actual focal length. Use full frame chart.

How to choose an f-stop: If I want to get really close to the foreground then I use a high number f-stop on my lens such as f/16. The smallest and largest number f-stop on a lens is usually not nearly as sharp as one stop down or open. For example I use f/16 instead of f/22 for landscapes.

What is the Sweet Spot?

Depth of field and sharpness are different. The depth of field is the area that is in good focus. The sharpness of the image is related to the f/stop choice made. The sharpest f stop number or aperture is referred to the sweet spot. If the image does not have a close foreground element then I would not use the hyperfocal distance. Then I would focus 1/3 into the scene. I would use the sweet stop (sharpest aperture on the lens) such as f/8 or f/11. If you wish to find the sweet stop, take a photograph at every f/stop on your lens and view at 100% on your computer to find which f/stop is the sharpest.

What is in focus?

Once you have focused the proper distance you can check to see if everything is in reasonably good focus. Press the depth of field preview button to give you a little better idea of what is in focus and what is not. Wait till you eyes adjust to the dim light when looking through the camera's view-finder. Another option is to use live view with your camera - see instructions in your manual for how to do that. Scroll to the top or bottom (doesn't go all the way) and press the magnify button to 10x. Then press and hold the depth of field preview button. It will show what is in focus and what is not. You can scroll to the top of the image and see if that is in focus as well. Adjust focusing as necessary. Using the DOF preview button with live view does not work on all cameras.

How to measure focusing distances:

When using the hyperfocal chart look up the focusing distance for your settings, say 5 feet. Many lenses do not have focusing distance markings on them. To find 5 feet I would estimate the distance or use a measuring tape to focus at 5 feet.

Another option is to use the measuring tape to figure out the distance you might normally use, such as 5 feet. I then count how many of my shoe foot lengths it takes to be 5 feet. That way when I am out in the field I can measure 5 feet by stepping on the ground the number of steps needed. I might find something to focus on at 5 feet or place a stick there to focus on and then remove it.

The image will look blurry in the camera but don't worry. After you take the photograph you can see on the LCD (or on your computer later) that it is not a blurry as when looking through the view finder.

Note: when estimating focusing in the field, I will use a bit farther focusing distance than the chart says just to make sure I get everything in reasonably good focus. Some people will use the next aperture setting on a chart just to make sure to get good depth of field. For example, set the camera to f/16 then use the focusing distance for f/11.

I recommend printing the chart and carrying it in your camera bag.

Other Notes:

A tilt shift lens would allow for more depth of field and you can shoot at f/8 instead of f/16.

Most fixed focal length lenses have the markings on the camera so you don't need to use the chart.

Other resources:

Photocalc is an iphone app for the depth of field calculator and other things. It has different numbers for the focusing distance than the chart I use. I recommend focusing a bit farther than the numbers that it uses.

Dofmaster.com is a website that explains depth of field and hyperfocal distance. Again, different numbers used for the focusing distance.