

DEPTH OF FIELD

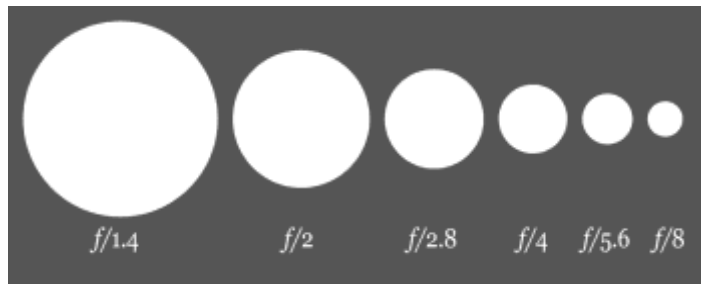
Depth of Field (DOF) is that amount of your shot that will be in focus. Depth of field refers to the range of distance that appears acceptably sharp. It varies depending on camera type, aperture and focusing distance, although print size and viewing distance can also influence our perception of depth of field.

Large depth of field means that most of your image will be in focus whether it's close to your camera or far away (like the picture to the left where both the foreground and background are largely in focus – taken with an aperture of $f/22$).

Small (or shallow) depth of field means that only part of the image will be in focus and the rest will be fuzzy (like in the flower at the top of this post (click to enlarge). You'll see in it that the tip of the yellow stems are in focus but even though they are only 1cm or so behind them that the petals are out of focus. This is a very shallow depth of field and was taken with an aperture of $f/4.5$).

What is Depth of Field with relevance to aperture?

Aperture has a big impact upon depth of field. One important thing to remember here, the size of the aperture has a direct impact on the **depth of field**, which is the area of the image that appears sharp. Large aperture (remember it's a smaller number) will decrease depth of field while small aperture (larger numbers) will give you larger depth of field.



The size of the circle represents the size of the lens aperture – the larger the f-number, the smaller the aperture. A large f-number such as $f/32$, (which means a smaller aperture) will bring all foreground and background objects in focus, while a small f-number such as $f/1.4$ will isolate the foreground from the background by making the foreground objects sharp and the background blurry.



Image on left shot at f/2.8, Image on right shot at f/8.0

As you can see, just changing the aperture from f/2.8 to f/8.0 has a big effect on how much of WALL-E is in focus and how visible the background gets. If I had used a much smaller aperture such as f/32 in this shot, the background would be as visible as WALL-E. Another example:



Mailboxes - Aperture set to f/2.8

In the above example, due to the shallow depth of field, only the word “Cougar” appears sharp, while everything else in the front and behind of that word is blurred.

You now know that focus is related to the distance between the subject and the lens. There will be one focus setting which is the best for a subject at any particular distance. But it's also true that on either side of this point (both closer and farther away) there's a certain range of distance within which focus is still acceptable. This range, from front to back, is known as the *depth of field*.

Lens Angle Affects Depth of Field

Wider lens angles give a greater depth of field. This means that when the camera is zoomed out all the way, your subject will be able to move forward and backward across a considerable range and still be in focus.

Narrower lens angles (especially telephoto) give a smaller depth of field. As you zoom in, the acceptable focus range for your subject will decrease. When you're zoomed in all the way on a close-up shot, the depth of field will be smallest.

Iris Setting Also Affects Depth of Field

The wider the aperture (the more open the iris) the smaller the depth of field. This means focus will be more problematic in low light conditions where the iris will need to be opened wide. You'll find that your subject won't be able to move forward or backward very far without going out of focus.

Telephoto Lens and Wide Iris Combined

The combination of telephoto lens (zoomed in all the way) and a wide aperture (big iris opening) gives you the smallest depth of field of all.

This is the hardest situation for shooting action over which you have no directorial control, because very small movements forward or backward will cause focus difficulties.

For example, if you're taping a singer in low light at a night-time outdoor concert, and you have the lens in telephoto to give you a close-up of her face on the screen, you'll find that if she sways only slightly forward or back with the feel of the music, she'll go in and out of focus.

There's not much you can do. Your work will look awful and people won't be able to understand why you didn't just focus the camera.

To retrieve the situation, you can stay on a wider angle shot, and then move your camera in closer to the stage when that song ends. But it's times like this that make you wonder how you got into video in the first place.

For better depth of field in lowlight conditions, you should try to either get in close to your subject so you can stay on the wide angle lens, or add lights, so you can use a smaller aperture.

Lens Angle Affects Depth of Field

Wider lens angles give a greater depth of field. This means that when the camera

I had used a larger aperture such as f/1.4 and focused on one of the letters, probably only that letter would have been sharp, while everything else would have been blurred out. The larger the aperture, the smaller the area in focus (depth of field) You now know that focus is related to the distance between the subject and the lens.

Aperture Priority/ Shutter Priority

Some cameras are automated to the extent that you can decide what function you want most and set that one, and the camera will adjust all the other function settings accordingly. For example, if your main concern is to freeze the motion in the image because you're a physio- therapist or

sports teacher and you're doing motion analysis, you can tell the camera to prioritise the high speed shutter setting. The camera will then adjust the iris and other functions to suit the high speed shutter setting you've selected. On the other hand, if you're mainly concerned with getting the greatest depth of field because you're videoing dancers who will be coming forward and backward in the frame and you need them to always be in focus, you can tell the camera to prioritise the aperture setting, and the camera will make all the adjustments needed to the other functions.