LOW DEPTH OF FIELD AND BOKEH

WHAT IS DEPTH OF FIELD?

Well……it's the distance between the nearest and furthest objects that are in focus. In our case we are considering low depth of field, and, therefore, are interested in how to throw the background (and sometimes the foreground) out of focus. We do this to draw attention to the subject, eliminate a distracting background, achieve bokeh, or just because it looks nicer.

THE FACTORS

There are four main factors determining the likelihood of achieving low depth of field (dof) in a shot. They are; the camera's sensor size, distance to the focus point, focal length and aperture. We'll look at these individually but bear in mind that there is some interaction between them. For example, if you use a longer focal length you will have to stand further away to achieve the same field of view, or to achieve the lens's minimum focussing distance.

1. Sensor size
   Sensor size indirectly affects depth of field because in order to get the same composition of a subject you will need to stand a different distance away for each sensor size.
   The effective focal length is also affected, leading, on most cameras, to an effective crop of the image compared to the same focal length on a full frame camera. To work out the effective focal length, take the focal length written on the lens and multiply by your sensor's crop factor. This varies slightly between manufacturers, but is roughly:

Full frame	1	
APS-C	1.5	(crops to two thirds full frame)
M4T (micro four thirds)	2	(crops to half full frame)

Therefore, the “easiest” sensor size to blur a background is full frame, with it becoming progressively slightly harder as the crop factor increases. On the flip side, smaller sensors are easier to produce front to back focus with.

2. Distance to focus point
   You will notice I didn’t say “distance to subject”, and that’s because the two are not necessarily the same, for example you may be using a technique known as hyperfocal distance, or not be focussing on the subject for some other reason.
   The distance to the focus point is the most powerful of the three factors you can use in the field. The nearer you get, the smaller the dof becomes, until you get to the point, at macro distances, where it can be measured in millimetres, and you may have to focus stack to get the whole subject in focus.

   Try using f1.8 at 100 yards to the focus point. The dof will be surprisingly large. Now try it at 3 feet and there will be no background in focus at all. The only difference is the highly influential distance to focus point.

3. Focal length
   This is the absolute focal length of the lens. Not the effective focal length mentioned above.
   Focal length is the second most powerful of the three factors you can influence in the field. Shorter focal lengths (10 – 35mm) can have huge dof, particularly at the “wide” end (10-16mm depending on sensor size)

"Long" focal lengths (300-600mm) have progressively smaller depth of field, but you usually must stand further from the focus point.

Try taking a shot from 1 metre distance at 18mm and f8. The depth of field will be quite big. Now do the same at 400mm, f8 from 1metre. The depth of field will be tiny.

4. Aperture

   You'll be glad to hear that there are no complications due so sensor size! The aperture is the aperture. It is the weakest of the three factors you can affect in the field, but still very useful.

   Wider apertures (lower f numbers) give lower depth of field, and narrower apertures (bigger f numbers) give greater dof.

   Ever wondered why wide apertures have low f numbers and not big ones? It's because of how the f number is calculated.

   F number = focal length / diameter of aperture

   And so as the aperture (and its diameter) gets bigger the f number gets smaller.
   Eg take a 100mm lens
   If aperture is 10mm across (diameter) f= 100/10 = f10
   If aperture is 50mm across f= 100/50 = f2

SUMMARY

You will need to use all 3 factors in concert, achieving a balance between the 3 to get your desired depth of field. Low dof usually involves wide apertures plus a mixture of the other two factors.