

## What is Diffraction?

First and foremost, what is diffraction? To briefly summarize, diffraction, in terms of photography, is when light waves bend around corners and interfere with one another when traveling through small holes, causing a loss in sharpness. Diffraction plays a role in determining the “sweet spot” of most lenses; and it varies from lens to lens.

While there have been many arguments, articles and theories about the “best aperture,” we believe that it depends on what you’re trying to capture and how much depth of field you need. In our general experience, diffraction starts to become noticeable around  $f/16$  and we never go above  $f/22$  (although some articles claim to notice it around  $f/13$ ; and some claim to have perfectly crisp pictures at  $f/45$ ).

Our argument is that some diffraction is unavoidable and therefore okay. In some situations, we’re willing to turn up the aperture and sacrifice a little bit of sharpness at the focal plane for better sharpness at the extremities of the depth of field. In other situations, the subject is the all-important focus of the scene; and we’re not willing to risk having diffraction cause any loss of its clarity.

In almost every image, the eyes naturally flow to one area of the image, whether it be by lines, contrast, frames, or colours. Our theory is that if this subject is dominant, meaning it’s essentially the only thing that matters in the scene, we use apertures at our lens’ sweet spots, light permitting (usually around two stops above their largest – lowest- aperture). If the subject is important, but something else on a different, yet relatively close, plane needs emphasis as well, we take the aperture between  $f/7$  and  $f/9$ . If everything in the frame is equally important, we might use something around  $f/11$  and  $f/14$ .

We might run our f-stops above  $f/14$  for other creative shots. For example, often times, the wedding venue isn’t ready until the last moment before people start coming through the door. In order to prevent capturing all the workers and waiters setting up, we simply raise our aperture up to its highest point ( $f/22$ ), then shoot the shot at 100 ISO with a 20-30” shutter speed. The long shutter and slow exposure make it so that the workers (so long as they are not standing still) are not noticeably captured in the picture.

From our experience, here is a brief summary of our aperture settings in full stop increments for different situations:

### **$f/1.2 - f/2.8$ :**

Lighting: Ultra low to low light

Sharpness: Poor – average

Bokeh: Heavy

Usage: Making subjects pop off the page, blurring out undesired backgrounds, capturing ambient light in low light situations

### **$f/4 - f/8$ :**

Lighting: average to bright light

Sharpness: Average – optimal

Bokeh: Moderate to light

Usage: Obtaining optimal sharpness, keeping backgrounds recognizable but still slightly out of focus, will require flash if used in low light situations

### **$f/11 - f/16$ :**

Bokeh: None. Full scene clarity, diffraction begins to reduce overall sharpness, full daylight or dragged shutters required for proper exposure

### **$f/16 - f/22$ :**

Full scene clarity, diffraction moderately reduces overall sharpness, full daylight or dragged shutters required for proper exposure