

What is Lens Diffraction?

The Smaller the Aperture, the Softer the Photo

Stopping down your aperture brings more of the scene into focus. But go too far, and the whole picture starts to lose its sharpness. This is known as **lens diffraction**:

f/2.8 – f/5.6

SHARPNESS

Image very sharp, fine detail

Low f-number, wide aperture

A low f-number means a wide opening on your lens. Light passes through with almost no spreading, so it reaches points on the sensor directly and the fine details stay crisp.

f/8 – f/11

SHARPNESS

Good sharpness but a touch softer

Higher f-number, narrower aperture

The higher the f-number, the narrower the aperture gets. That means light squeezing through the smaller gap then spreads out, so that same point covers more of the sensor. Fine edges and details begin to lose their sharpness.

f/13 – f/22

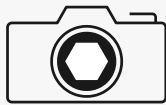
SHARPNESS

Visibly soft, loss of detail

Highest f-number, smallest aperture

At the highest f-numbers, f/13 through to f/22 (about as small as most lenses go), the spreading will be at its worst. Every point becomes a soft blob, and neighbouring details run into each other, making the whole frame look soft and blurred.

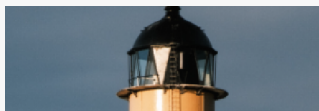
aperture opening f/2.8 – f/5.6



one point of light



fine detail in the photo



details crisp



aperture opening f/8 – f/11



one point of light



fine detail in the photo



edge detail starts to soften



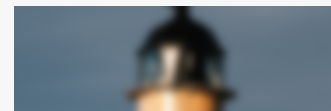
aperture opening f/13 – f/22



one point of light



fine detail in the photo



detail and texture is lost



RULE OF THUMB

Most Lenses are Sharpest Around f/5.6 to f/8

- Two or three stops down from wide open is the sweet spot for almost every lens.
- Only go past f/11 when you need the extra depth of field more than you need the finest detail, which is often the case in landscapes and close-ups.
- Softness in lens diffraction cannot be reversed in editing. It is a permanent loss of detail.