

Diffraction Awareness.

What is diffraction and why you should know about it:

1. Introduction video:

'Diffraction introduction.mp4'

2. What is diffraction, and what are the consequences.

Please read the following page carefully:

<https://www.cambridgeincolour.com/tutorials/diffraction-photography.htm>

Resume video about the web link: 'Diffraction Resume.mp4'

3. The practical approach to define the negative consequences of diffraction in your camera exists in three steps:

- Make a series of test images in a controlled setup.
- Import and analyse the images in Adobe Lightroom or equivalent RAW developing software.
- Define the optimal range of apertures for your camera.

4. The test images. View the video **'Diffraction Practical Test.mp4'**

For this test you are going to make a series of images of a stationary subject. Considerations to follow:

- Make sure your subject contains a lot of details, and keep some distance from the subject (approximately 1 meter is fine)
- Put your camera on a tripod, and make sure it does not move during the test shot series. A cable release or self timer exposure will prevent camera shake due to pressing the shutter. Working in live view will prevent mirror flip-up shake.
- Make the images in RAW.
- Deactivate the image stabilisation on your lens if you have it.
- Focus must be unaltered during the series of images: Focus manually for the first shot and don't touch your focus ring after that.
- Work in Aperture priority mode
- Keep your ISO setting at the lowest value
- Work in a medium bright environment to keep your shutter speeds within the limitations of your camera. Especially with the closed down aperture your shutter speeds will become in the range of seconds.

5. Analysing the test images in Lightroom. You can use the **'Import and analyse images.mp4'** video as a guide.

- Import all images in the RAW editor of your choice
- Apply lens distortion and color aberration correction to the first image.
- Make the smallest possible crop in the first image, on a detail you have focussed on in the first image.
- Synchronise the lens corrections and the crop settings of the first image to all other images.
- Maximise your working space and arrange the images to visualise them as large as possible in a simultaneous view. (shortcut N in Adobe Lightroom)
- Look at the sharpness in your image sequence. If the test has been performed correctly you should see an increase in sharpness in the first images, then from a certain point you will observe a decrease in sharpness.

Conclusion

- *Diffraction is an optical effect that cannot be avoided. Diffraction is related to the pixel density of your camera/sensor. The higher the pixel density, the sooner the effects of diffraction will become obvious.*
- *Never close your aperture more than needed, and avoid closing it beyond the point where diffraction becomes significant.*
- *Consider focus stacking in stead of extremely small aperture settings if you want to reach greater depth of field*