

What Does The ISO Number Mean?

Overview Since the beginning of photography, film was measured by its sensitivity to light. A “fast” film was very sensitive to light, which means it did not need to be exposed to light very long. A “slow” film was not as sensitive to light and needed to be exposed to light for a longer period of time.

Numbers were assigned to different speed films so that photographers could tell if they had fast or slow film. The numbers were used to designate that film’s speed, or sensitivity to light. Therefore, you would hear people ask for “100 speed film”, “400 speed”, and so on.

While there were a range of film speeds, starting at ISO 25 (a very slow film) and going up to ISO 6400 (a very fast film), we’re only going to talk about ISO speeds between 100 and 3200.

How the numbers work The lower the number, the slower the speed. In other words, ISO 100 refers to a slow speed, or low sensitivity to light. Being less-sensitive means that it requires to be exposed to light for longer periods of time to make an image.

The higher the number, the faster the speed. Therefore the ISO 3200 speed is very fast, or very sensitive to light meaning it requires a much shorter exposure to light.

The numbers, though, are directly related to each other. Remember that everything in photography is measured in *stops*. A stop is twice the value as the one before it and half the value as the one after it. Therefore:

- ISO 200 is twice the speed, or twice as sensitive to light as ISO 100 but half the speed as ISO 400.
- ISO 400 is again half the speed of ISO 800 but twice the speed of ISO 200.
- ISO 100 is four times slower than ISO 400 and four times faster than ISO 1600.

Understand how the ISO numbers relate to speed and to each other?

How does this relate to digital photography?

In the age of digital photography, changing the ISO value allows you to adjust the sensitivity of the sensor in your camera. Most digital cameras allow you to set an ISO value as low as 100 and as high as 1600 with some cameras allowing for 3200.

This means you can adjust the amount of light needed to take the picture.

But why not just set your camera to its fastest setting so that you can shoot at faster shutter speeds or in lower light? That's because as you set your ISO speed higher and higher, you introduce something called *noise*.

The best way to understand noise is to look at its effect:

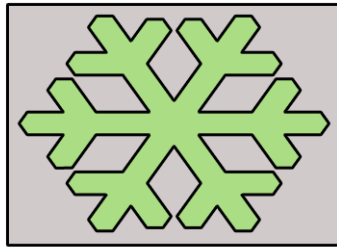


Image without noise

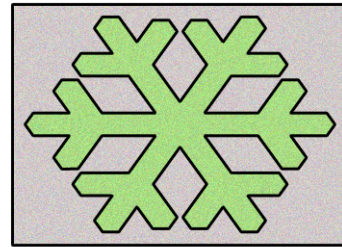


Image with noise

Noise refers to the extra pixels that appear in the final image. The higher the ISO number, the more noise that can be introduced to the image. Most digital cameras today won't see a lot of noise until you shoot faster than ISO 400 with some cameras being capable of not introducing noise at ISO 800.

That's the trade-off. You can shoot with faster shutter speeds or in lower light but you can introduce noise to the final image. The lower ISO numbers are virtually noise free and result in very clean and crisp images.

So... Knowing how to adjust your ISO settings, and what the effect is, gives you a lot of latitude and options for shooting. Set it high for fast shutter speeds and set it low for noise-free images.