FILM SPEED/ EXPOSURE METER

1. Film Speed

"Film speed is the measure of a photographic **film's** sensitivity to light, determined by sensitometry and measured on various numerical scales, the most recent being the ISO system. A closely related ISO system is used to measure the sensitivity of digital imaging systems."

How important is film speed?

Many people today love using a digital camera to take pictures, but others still prefer the old-school charm and control of traditional film. When we talk about **film speed**, we're referring to the measure of a film's sensitivity to light. Each film speed is best suited for a different type of photography.

The lower the speed, the longer an exposure to light is necessary to produce image density. If the film speed is higher, it requires less exposure but generally has reduced quality in the form of grain and noise. Noise and grain are the abnormalities in brightness and color in images; they look similar to a layer of "snow" on a television set. They're measured using the ISO system from the International Organization for Standardization (thus the ISO, which is used as an abbreviation for the group and the film speed) and are the giant numbers you'll typically see on a box of film. You'll also see the abbreviation ASA (American Standard Association) used in conjunction with film speed. ASA and ISA are interchangeable.

The rating still applies to digital photography even though the cameras don't use film. ISO speed is used in digital cameras to judge the relationship between the exposure rating and the sensor data values. Most advanced cameras have an ISO setting available, which emulates the speed rating of film. The basic rules of film speed apply equally to film and digital cameras.

Slow-speed films generally refer to film with 100-200 ISO ratings. These slower speeds are excellent for outdoor landscape photography and inanimate objects. They can also be a great choice if it's a particularly sunny day. Since the film takes longer to absorb light, it captures detail more effectively. So if you plan on enlarging those pictures you'll want to shoot with the lowest ISO possible.

Medium speed is 400 ISO. As can be expected, the medium speed is probably the best for general-purpose use and can handle indoor lighting conditions, overcast days and any combination of the two. Even so, it's not suited for action shots or very bright days.

Fast-speed film is usually rated at 800 ISO and above. It's best for moving subjects you might see at a sporting event or concert, or when you plan on using a zoom lens or are shooting in a dimly lit area. Unfortunately, if you plan on enlarging the photos, they'll likely turn out grainy

Film speed is remarkably important and can make or break a photograph. There are exceptions to the above rules, and experimenting can certainly yield impressive and interesting results, but the fact remains that the film speed you choose will have a direct effect on the quality and density of the picture you take, regardless of whether you're shooting digital or on film.

2. Exposure meter and gray card

Exposure Meter:

In digital **photography exposure meter** is an instrument for measuring the amount of light falling on or being reflected by a subject, and usually equipped to convert this measurement into usable information, such as the shutter speed and aperture size required to take a reasonable **photograph**.

Link: http://www.webopedia.com/TERM/E/exposure_meter.html

GRAY Card:

A **gray card** is a middle **gray** reference, typically used together with a reflective light meter, as a way to produce consistent image exposure and/or color in film and photography. A **gray card** is a flat object of a neutral **gray** color that derives from a flat reflectance spectrum.

Link: https://www.google.com.pk/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=gray+card

3. Types of light meters

Choosing Hand Held Exposure Meters

Hand-held exposure meters measure light falling onto a light-sensitive cell and converts it into a reading that enables the correct shutter speed and or lens aperture settings to be made. Hand-held exposure meters come in many variations, each with specific benefits. By using the appropriate meter for your specific needs, you can be assured of consistent professional results.

Incident vs. Reflected

The two distinct techniques of measuring light,

1. Incident and

2. Reflected

Each have their own advantages in different situations. Hand held meters can give you both capabilities, along with features not found in even the most advanced cameras with built-in meters.

The 18% Neutral Gray Standard

Light meters are designed to measure light in a consistent way. They cannot see the subject and interpret it as a photographer can. For example, a light meter cannot distinguish a black cat from a white cat, a red balloon from a blue balloon, nor textured powdery white snow from a shiny white auto paint finish. Given the same lighting situation, each of these objects would reflect a different amount of light.

Reflected measurements would indicate different exposures for each object. Incident measurements would indicate the same exposure for each object, to render a consistent exposure. Light meters are calibrated to assume that all subjects are of average 18% reflectance, or neutral gray. The use of the 18% neutral gray standard allows a reflected light meter to render correct readings for "average" subjects in "average" lighting situations. (The value of 18% neutral gray is also referred to as Zone V in the Zone System, an advanced black and white exposure method.)

Incident Metering

The incident meter is aimed at the light source and measures the light source falling directly on a scene and is not influenced by the reflectance of the subject being photographed. For more precise control of the photograph, incident meters are also used to measure various levels of light from multiple sources falling on separate parts of a scene.

Using Incident Meters

Incident metering measures the intensity of light falling on the subject and gives accurate and consistent rendition of the tonality and contrast regardless of reflectance, background, color, and shape. Subjects that appear lighter than gray will appear lighter. Subjects that are darker than gray will appear darker. Colors will be rendered accurately. Highlight and shadow areas will fall naturally into place.

NOTE: Most light meters allow for both reflected and incident light readings.
Advantages of Incident Measurement

Incident meters measure accurately and consistently and are not affected by variances in reflectance of the subject or scene. Because of this, incident meters give the most accurate exposure for the majority of situations and subjects.

Reflected Metering

Reflected metering reads the intensity of light reflecting off the subject and may vary according to variances in tonality, color, contrast, background, surface, or shape. Meters are designed to regard all subjects as 18° neutral gray reflectance. Reflected measurement of any single toned area will result in a neutral gray rendition. Subjects that appear lighter than gray will reflect more light and result in an exposure that renders it darker. Subjects that are darker than gray will reflect less light and result in an exposure that renders it lighter.

Using Reflected Measurement

Hand-held reflected light meters and built-in camera meters read the intensity of light reflecting off the subject and measurements are taken from the camera position. Generally, reflected measurement of a wide subject area can include many different reflective surfaces or colors that can bias the meter and result in inconsistent and erroneous readings. Accuracy of a reflected measurement can be improved by reading an 18° neutral gray test card placed in front of the subject.

Light meters in cameras react to how intense the light is as seen from the camera. SLRs measure the light (called *metering*) through the lens – TTL. They collect light that has actually passed through the camera's lens and measure its intensity. There are problems when the scene has parts that are much brighter or darker than others, for example shadows on a sunny day. This can trick the light meter into measuring the intensity of the light incorrectly, depending on which part of the scene was illuminating the sensor.

Modern SLR cameras use multi-point light meters, meaning that several light meters are actually scattered around the projected scene, each measuring the light intensity at that point. Very sophisticated cameras may have dozens of metering points. How much the measured intensity of the light at each point influences the final meter reading depends on the metering mode selected by the photographer.

For a more detailed look at metering modes, you can read: <u>Introduction to metering modes.</u>

How to Use the Light Meter

As we now know, the correct exposure is created by juggling the three points of the exposure triangle: aperture, shutter and ISO. The light meter is the tool that puts us in the right neighborhood for how these should be set. If you are shooting on full auto, then when you meter the scene – usually done at the same time as focusing, by half pressing the shutter – the light meter gives its best guess for each of these variables.

If you want to take creative control of the photo, you can manually set each of the three variables yourself. Typically ISO is left at the default, or previous setting, and you take control by choosing aperture priority or shutter priority. On most DSLRs that's done by turning the exposure mode dial. If you set the dial to Av – aperture priority, the photographer chooses what the aperture will be, and the light meter adjusts the shutter speed to maintain the correct exposure. The reverse is true for TV – shutter priority.

When using these modes, it's useful to refer to the exposure meter display on the camera. The **exposure meter** (display) shows the result of the measurement taken by the **light meter** (sensor). It will typically look something like this:
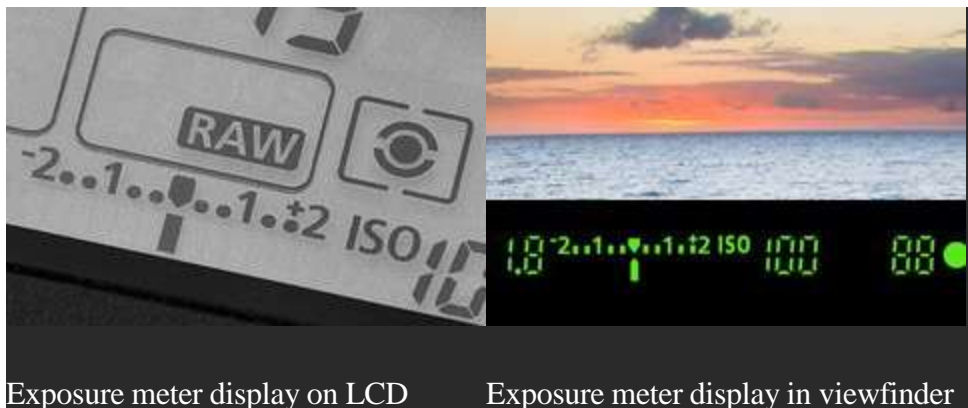
Exposure meter display on LCD   Exposure meter display in viewfinder

Each number represents a stop change in the light, as indicated, with the central mark being the "correct" exposure, as determined by the light meter. Each pip between the numbers represents one third of a stop. The arrow underneath indicates how close the current settings are to the correct exposure. Usually in priority modes, the arrow will stay in the middle as the light meter will be able to set the exposure correctly. However, if for example you set your aperture to 1/400sec in Tv (shutter priority mode) and the light meter indicated that you needed an aperture of f4, but your lens was only capable of f5.8, then the exposure meter will display one stop of underexposure. You will need to compensate for this by setting a longer shutter time, or increasing the ISO.

The juggling act becomes more complicated, and the light meter's assistance more valuable, when you go to full manual control of the exposure. Here the exposure meter simply displays whether the current settings will under or over expose the image, according to the light meter. The photographer can freely change any of the values on the exposure triangle, and see the change to the predicted versus recommended exposure.

Exposure compensation

Even though the light meter in your camera is pretty sophisticated, sometimes it can get it wrong, especially with harsh contrasts, or highly reflective surfaces. Changing metering modes may help this, but a more controlled approach is to use exposure compensation. Imagine you are photographing a person against a large bright sky. The light meter thinks the sky is the most important part, and exposes correctly for that, leaving the person a dark silhouette. By using exposure compensation, you can tell the camera to take the metered exposure and make it brighter by a chosen amount. This will then allow the photographer to correctly expose the person. I'll look at exposure compensation in more detail in a future post.

To show you how the different exposure modes might work in real world situations, here are some scenarios. The settings given below are what they happened to be for the examples shown. Settings for your own photo will be different.

Scanario 1 – Sports

- High speed is needed to freeze action
- Use Shutter Priority
- Set shutter speed to 1/800sec
- The light meter sets the aperture to f10
- If under exposed, change ISO to compensate – ISO400

Scanario 2 – Portrait

- An artistic narrow depth of field is desired
- Use Aperture Priority
- Set aperture to f5.6
- The light meter sets the shutter to 1/160sec
- If under exposed, change ISO to compensate – ISO100

Scenario 3 – Night scenery

- Ambient light is too low to accurately meter
- Use full Manual
- Set aperture to suit scene, erring to wider – f11
- Set a long shutter speed to light meter's best guess – 20sec
- Set ISO to lowest possible for correct exposure – ISO100
- Take a test shot and adjust settings if the light meter got it wrong

Scenario 4 – Off-camera manual flash

- On auto, meter the scene and note settings
- Set camera to one or two stops under exposed
- Set up flashes and tweak power to expose correctly
- Tweak the flashes exposure by adjusting aperture
- Tweak the ambient light by adjusting shutter speed
- Settings for example shot: 1/160sec f8 ISO125, click image for flash details.