Understanding Guide Numbers

You may have heard of guide numbers and wonder just what they mean. They are as they say a guide to aid you in establishing the proper exposure based on flashes output ability. And they will help you determine a proper flash exposure, but like anything they are not absolute and may be fudged some for even more precision in flash exposure.

Every flash comes with a guide number assigned by the manufacturer. My Canon 580EXII has one and it is 190. The Canon 430EX is 141 while the Nikon SB900 guide number 157. Your flashes manual will tell you what the GN is for your unit and it changes based on the focal length of your lens and ISO.

The 580EX II has a GN of 190 at ISO 100 and using a 105mm lens while the SB900 has a GN of 157 at ISO 100 and with a 105mm lens. These designations are arbitrary and change based on ISO and lens used. So they really are only a guide.

For example, at ISO 100 and subject-to-camera distance of 10', the SB900 GN is 88 with a 24mm lens. For 50mm lens it is 130. At ISO 200 the GN with a 50mm lens becomes 157. As you can see, the lens focal length changes the GN as does ISO.

To use a guide number to establish proper flash exposure the math is simple:

F=GN/D F-Stop equals the Guide Number divided by Distance (Flash to Subject) in feet.

Or,

D=GN/F Distance (Flash to Subject) equals the Guide Number divided by the F-Stop In feet.

When using GN's, most of the time we wish to establish proper aperture or f/stop. To calculate this you take the GN and divide it by the flash-to-subject distance. For the Canon 580EX the GN is 190 divided by 10' = f/19. Or instead, if you wish to use a specific aperture you can instead use the math to determine the flash-to-subject distance. 190 divided by f/11 = 17'. So you would place the flash 17' from the subject. The important thing to remember is the variables. The focal length of the lens changes GN. The ISO changes the GN.

If you are wondering if you will ever use this you just might. Nikon's SB900 when used in manual flash mode and off-camera tells you what flash-to-subject distance should be for a specific aperture and you then place your flash that distance from the subject. This happens because you can enter the ISO and aperture into the SB900 menus on the flash.

Unfortunately the Canon's do not work this way. The 580EXII will provide flash-to-subject information with a TTL wireless setup as long as the camera and flash can talk to each other so the flash knows what ISO and aperture are set on the camera. If you do not have a TTL wireless connection between flash and camera then this info is not available. And the 430EX? It has no distance scale ability at all so here GN calculations come to the rescue.

How will you ever remember this? I suggest that you open your flash manual and Xerox the chart in the manual and then laminate it to carry it with you. This will allow you to quickly establish your ISO, lens focal length, and then the proper GN based on that info. From there you can calculate the proper flash-to-subject distance as well and the aperture using the simple math equation above.

Have fun!

Charlie