Reciprocity and Reciprocity Failure

**Reciprocity** is the time-intensity relationship that all photographic films and papers share for a given ASA/ISO sensitivity level. If a film is rated at ASA/ISO 100 the time-intensity relationship will remain the same throughout the entire scale of f-stops and shutter speeds for that film. An exposure at 1/60 second using F/11 would be the same as an exposure using 1/30 second at f/16, 1/1000 second at F/2.8 or 1/8 second at F/32. The exposure (or exposure equivalency) remains the same despite what shutter speed you need to achieve or how much depth-of-field.

**Reciprocity Failure** is when the time-intensity ratio breaks down and does not conform to the given ASA/ISO sensitivity standards. Reciprocity Failure is different for every film and paper on the market. It normally occurs on very short or very long exposures. In other words, it may be difficult for film to record an image when the shutter speed is faster than 1/4000 of a second or slower than ½ second. The photographer will have to compensate for the emulsion insensitivity by giving the film more light which can be done in two ways, by extending the shutter speed (making it longer) or opening up the aperture (making it larger) to compensate for the ASA/ISO speed (sensitivity) loss and keep from having an under exposed negative.

If you know you are extending the reciprocity limits of your film you need to check the manufacturers recommended development time for reciprocity recommendations. When most films reach their reciprocity limits they have a tendency to gain contrast (especially in the highlights) so it may be important to under develop your film to have a printable negative or usable transparency.

All manufacturers publish reciprocity limits on their products, but you may have to go to their web site to look it up. I highly recommend downloading the PDF files from the manufacturer on the films and papers you use and keeping it in a notebook. This information can be invaluable.