TECHNICAL INFORMATION

FILM RECIPROCITY FAILURE COMPENSATION

HOW TO ALLOW FOR LOW INTENSITY RECIPROCITY FAILURE DURING LONG EXPOSURES WITH ILFORD BLACK AND WHITE FILMS

Low Intensity Reciprocity Failure describes the phenomenon where if the same total exposure is given to photographic material over a longer period of time then the density of the image generated is lower (effective speed is reduced).

It is caused by a reduced efficiency in forming stable development centres with lower levels of light.

Our Film Fact Sheets use graphs based on a single factor for all our films. We have carried out work to calculate this speed reduction for each individual camera film. Instead of showing the results in a graph we believe it will be more flexible to give a factor for each film and a calculation method. Exposure times of one second or less will not require any compensation.

Use a calculator to calculate the Reciprocity Failure correction

This uses the equation $Tc = Tm^P$

Where Tm is the metered (indicated) time and Tc is the corrected time. P is a factor calculated following a range of exposure times

Enter into the calculator the metered (indicated) time in seconds.
Press the x^y button and enter the factor for the product from the table below and then the = button.

So, for example, using HP5+ at a metered time of 10 seconds gives us:

Tc = 10 exp 1.31 = 20.4 seconds

Round this result off to give an exposure of 20 seconds.

FACTORS FOR ILFORD FILMS

Film	Factor (P)
SFX	1.43
Pan F+	1.33
D100	1.26
D400	1.41
D3200	1.33
FP4+	1.26
HP5+	1.31
XP2	1.31
Ortho+	1.25
K100	1.26
K400	1.30

For very long exposures at very low light levels then some other variables come in to play such as the accuracy of the light measurement. This means that some trial and error may be required.

You may also find that the contrast is increased with long exposures. This is because of the light level difference in light levels between highlights and shadows in the image in effect giving different reciprocity failure within the image. If this occurs, then pulling the development may be required (reducing development time) but will depend on the range of light levels in the image.

Please note: the x^y button can be found on scientific calculators, PC calculators in scientific mode and on most smart phone calculators when used in landscape mode.

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