



Estimating Luminance and Illuminance With Reflection-Type Exposure Meters and an 18% Neutral Test Card

Strictly speaking, “light” is the name given to electromagnetic radiation that can evoke a human visual response. Meters that measure the brightness of a surface (luminance) or the amount of light incident on a test area (illuminance) are designed to match as nearly as possible the spectral response of the average human eye.

Photographic exposure meters also respond to light, but the spectral response of such meters never matches the spectral sensitivity of any photographic film or the spectral response to the human eye. In fact, an imperfect spectral match with representative films can actually increase the probability of making correct exposure determinations.

As a matter of convenience, exposure meters are calibrated during manufacture in photometric (i.e., visual) terms with light of a particular color temperature. Other test conditions and calibration constants are selected to optimize exposure determinations for a variety of film types and a wide range of photographic situations. Unless such meters

are fitted with an accessory converter (offered by some meter manufacturers), they will generally provide an accurate indication of luminance or illuminance only when the actual conditions are close to those used during calibration.

In the absence of a properly designed and carefully calibrated light meter or an adapter intended to convert an exposure meter into a light meter, you can *estimate* luminance or illuminance values with a reflection-type exposure meter and an 18% neutral test card; such as a Kodak Gray Card.

Set the meter for 1/30 second and a film speed of ISO 400. Hold the meter close enough to the gray card so that the meter “sees” only the card and excludes the background. Convert the meter reading into the appropriate f-number and find the value of luminance or illuminance.

Note: The luminance or illuminance values obtained by using this method are only approximate.

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f-number	LUMINANCE		ILLUMINANCE	
	cd/ft ²	Footlamberts	Footcandles	Lux
1.0	.08	.26	1.5	16
1.4	.17	.52	3	32
2.0	.52	1.05	6	63
2.8	.67	2.10	12	125
4.0	1.34	4.20	23	250
5.6	2.67	8.40	47	500
8.0	5.35	17	93	1000
11.0	10.70	34	190	2000
16.0	21.40	67	375	4000
22.0	43	135	750	8000
32.0	86	270	1500	16000
45.0	171	540	3000	32150
64.0	342	1075	6000	64300

Kodak Professional