

Luminous flux (Lumens) measurements for ROBE Lights

Luminous flux

In photometry, **luminous flux** or **luminous power** is the measure of the perceived power of light. It differs from radiant flux, the measure of the total power of light emitted, in that luminous flux is adjusted to represent the sensitivity of the human eye.

Units

The SI unit of luminous flux is the lumen (lm). One lumen is defined as the luminous flux of light produced by a light source that emits one candela of luminous intensity over a solid angle of one steradian. In other systems of units, luminous flux may have units of power.

Weighting

The luminous flux accounts for the sensitivity of the eye by weighting the power at each wavelength with the luminosity function, which represents the eye's response to different wavelengths. The luminous flux is a weighted sum of the power at all wavelengths in the visible band. Light outside the visible band does not contribute. The ratio of the total luminous flux to the radiant flux is called the luminous efficacy.

Contexts

Luminous flux is often used as an objective measure of the useful power emitted by a light source, and is typically reported on the packaging for light bulbs, although it is not always prominent. Energy conscious consumers commonly compare the luminous flux of different light bulbs, since it provides an estimate of the apparent amount of light the bulb will produce, and is useful even when comparing different technologies, such as incandescent and compact fluorescent bulbs. For example, a typical 100 watt incandescent light bulb emits about 1700 lumens. Roughly the same amount of light can be produced at a quarter the cost by a 25 watt compact fluorescent light bulb. The article on incandescent light bulbs has more information on the efficiency of different light sources.

It is wrong or at least imprecise to refer to luminous flux as a measure of "brightness" since, for example, a nearby source of light may appear much brighter than a faraway source with much higher luminous flux. This is because not all of the emitted flux is received by your eye, and you receive less flux from sources that are farther away. In general, brightness has no unambiguous scientific meaning, and should be used only for nonquantitative references to physiological sensations and perceptions of light.

Lumen

The **lumen** (symbol: lm) is the SI unit of luminous flux.

Definition

$$1 \text{ lm} = 1 \text{ cd} \cdot \text{sr} = 1 \text{ cd} \cdot \text{m}^2 \cdot \text{m}^{-2}$$

Explanation

If a light source emits one candela of luminous intensity into a solid angle of one steradian, the total luminous flux emitted into that solid angle is one lumen. Alternatively, an isotropic one-candela light source emits a total luminous flux of exactly 4π lumens. The lumen can be thought of casually as a measure of the total "amount" of visible light emitted.

A standard 100 watt incandescent light bulb emits approximately 1700 lumens. See luminous efficacy for the specific efficiency of various types of electric light sources.

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AT Series		Angle	Lumen		Angle	Lumen
ColorMix 150		19°	3190	ColorSpot 2500E AT	10°	29 300
ColorSpot 170 AT		19°	3190		30°	30 600
Recessed Spot 170		19°	3190	Image Spot 250 AT	15°	3790
ColorSpot 250 AT		12°	2940	ColorMix 150 Wash	21°	4350
		15°	3090	Recessed Wash 150	21°	4350
		18°	3440	ColorMix 240 AT	8°-22°	6020
ColorSpot 575 AT		15°	5870	ColorMix 250 AT	8°-22°	6020
		18°	7490	ColorMix 550 AT	10°-26°	14620
		22°	8210	ColorMix 575 AT	10°-26°	14620
Colorspot 575E AT		15°	6250	ColorWash 1200E AT	Front Fresnel lens	13°
		18°	7970		Front Fresnel lens	44°
		22°	8740		LightMax mode	10°
Colorspot 1200 AT		13°	18000			33370
		42°	21430	ColorWash 575 AT	Front Fresnel lens	12°-34°
ColorSpot 1200E AT		13°	19180			19600
		42°	22810	ColorSpot 2000E AT		13°
ColorSpot 2000E AT		13°	25100			25100
		42°	27200			42°
				ColorSpot 2500E AT		10°
						30°
						29300
						30600
XT Series		Angle	Lumen		Angle	Lumen
Spot 150 XT		19°	3190	DJ Scan 150 XT	19°	1330
Spot 160 XT		19°	3190	DJ Scan 250 XT	19°	2240
Spot 250 XT		12°	2940	Scan 250 XT	12°	2320
		15°	3090		15°	2820
		18°	3440		18°	3180
MS Zoom 250 XT		15°	3790	Scan 575 XT	15°	4600
		18°	4260	Scan 1200 XT	15°	9000
		21°	5030		21°	9230
		24°	4980		28°	10130
		26°	4055	Wash 150 XT	21°	4350
Spot 575 XT		15°	7040	Wash 250 XT	8°-22°	6020
		18°	10270	Ecolor 250 XT	8°-22°	6020
		22°	11100	Wash 575 XT	7°-28°	14310
Beam 250 XT		11°-20°	1930			
CT Series		Angle	Lumen		Angle	Lumen
ClubSpot 250 CT		12° angle	2940	ClubScan 150 CT	19°	1330
		15° angle	3090	ClubScan 250 CT	19°	2240
		18° angle	3500	ClubWash 250 CT	8°-22°	6020

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