



Lumens Guide

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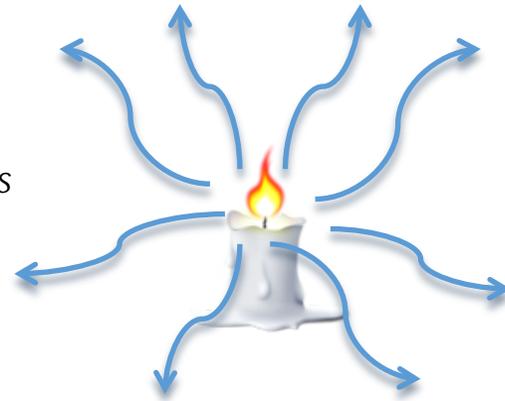
Useful Lumens – What does it even mean?

'Useful lumens' is the term coined by the EU to blur the line between Lumens and Candela.

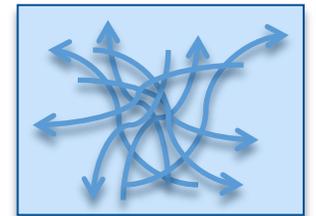
"Great, but what is a Lumen?" We hear you ask.

The lumen can be thought of as a measure of the total "amount" of visible light in some defined beam or angle, or emitted from some source. For example: Consider a candle giving off light:

As you can see light in the form of arrows is being given off in all directions.



Total Lumen Box



In order to measure the light from the candle (the total lumens) we gather up all the little arrows and measure them. This crude description gives us our total lumens.

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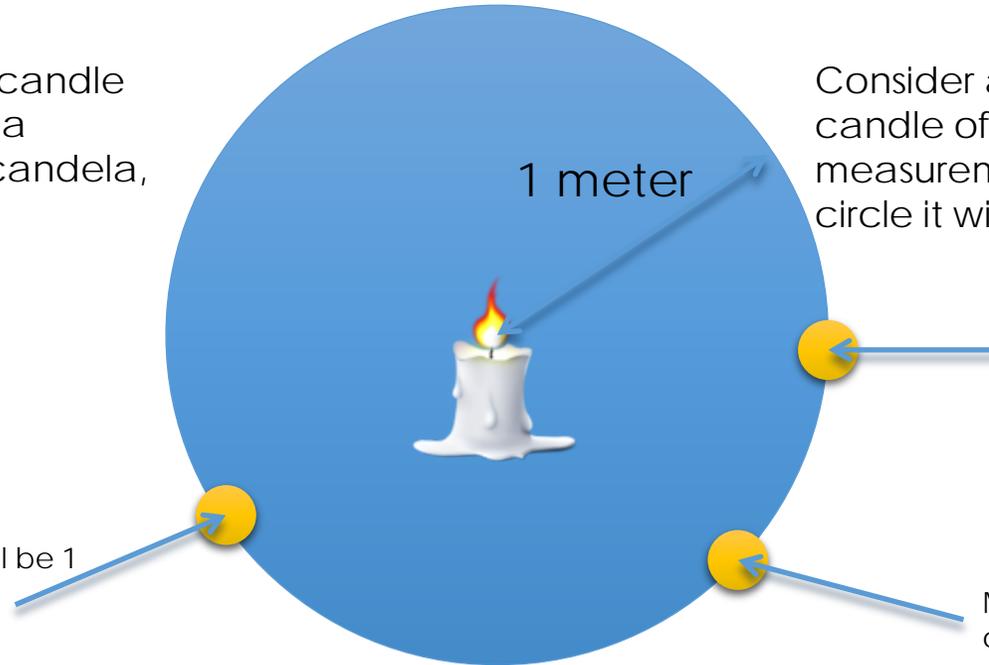
Okay thanks, but what is a 'Candela'?

The **candela** (symbol: **cd**) is the unit of luminous intensity; that is, power emitted by a light source in a particular direction.

A common candle emits light with a luminous intensity of roughly one candela. If emission in some directions is blocked by an opaque barrier, the emission would still be approximately one candela in the directions that are not obscured. **For example our candle:**

A standard household candle roughly emits light with a luminous intensity of 1 candela, this means:

Measurement here will be 1 candela



Consider a big circle around the candle of 1m in radius. If you take a measurement at any point on this circle it will measure 1 candela.

Measurement here will be 1 candela

Measurement here will be 1 candela

That in a nutshell is Candela, a unit of measurement of intensity of light in any one point.

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I thought Candela was for directional lamps only?

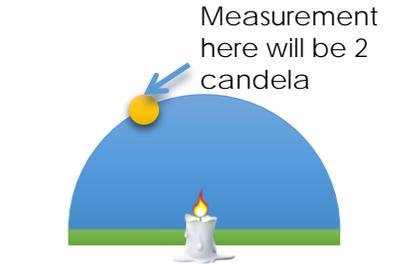
It is used in the lighting industry for measurement of directional lamps however I've just told you what it means. For directional lighting Candela (crudely) works like this:



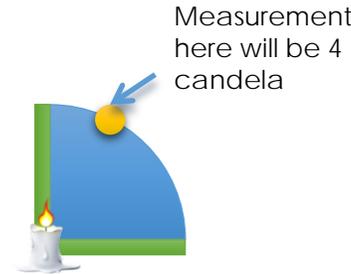
1 candela on any point on the surface of the circle



Imagine this green line is a 100% reflective surface



Because of the reflective surface, this works to reflect the half of the light that would have been sent behind, forwards, therefore making the light in the half circle double, therefore at any one point on the surface it would measure 2 candela



This circle is now a quarter therefore all the light that would have been in the full circle is now 4 times brighter, therefore, yes it is 4 candela



The circle is now half of a quarter, which is an eighth. So, now we have 8 candela at any one point.

As you have seen, we have managed to create a reflector lamp of sorts that gives off 8 times the light intensity that the original candle gave off in a specific direction

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Okay, please explain 'useful lumens'

As we said at the start, the term 'useful lumen' has blurred the lines between lumen and candela. Depending on the beam angle and the type of technology the light output will look more like this for the 4W COB;

Consider our 4W COB GU10 shown here:

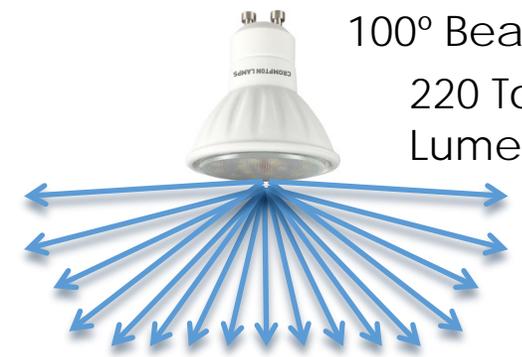


Total Lumens means all the light given out by this reflector, whether it is to the side or straight forwards.



30° Beam Angle
220 Total Lumen

Compared to the 3W SMD:
100° Beam Angle
220 Total Lumen



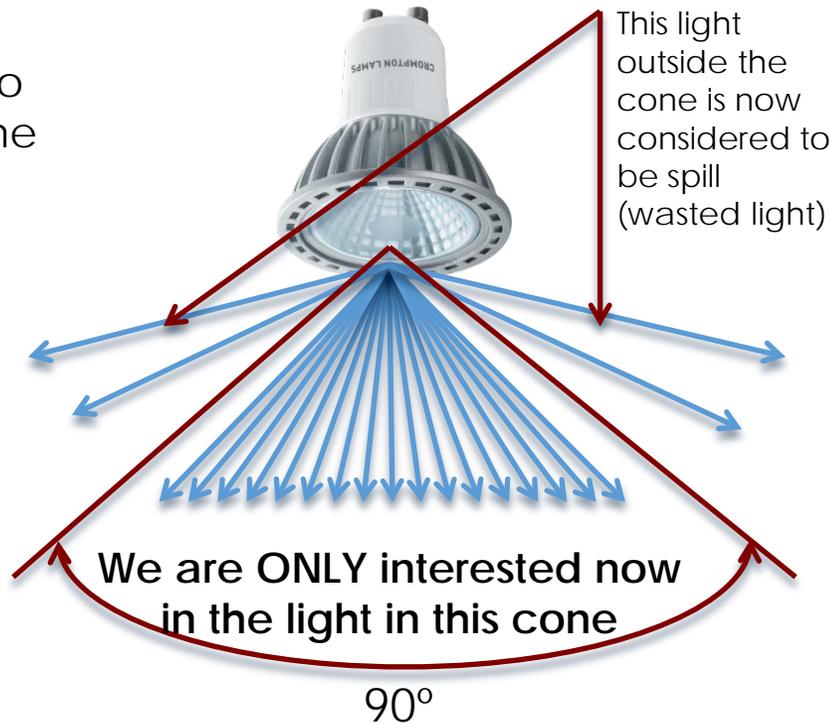
As you can see they are two completely different beam spreads but have the same Total Lumen!

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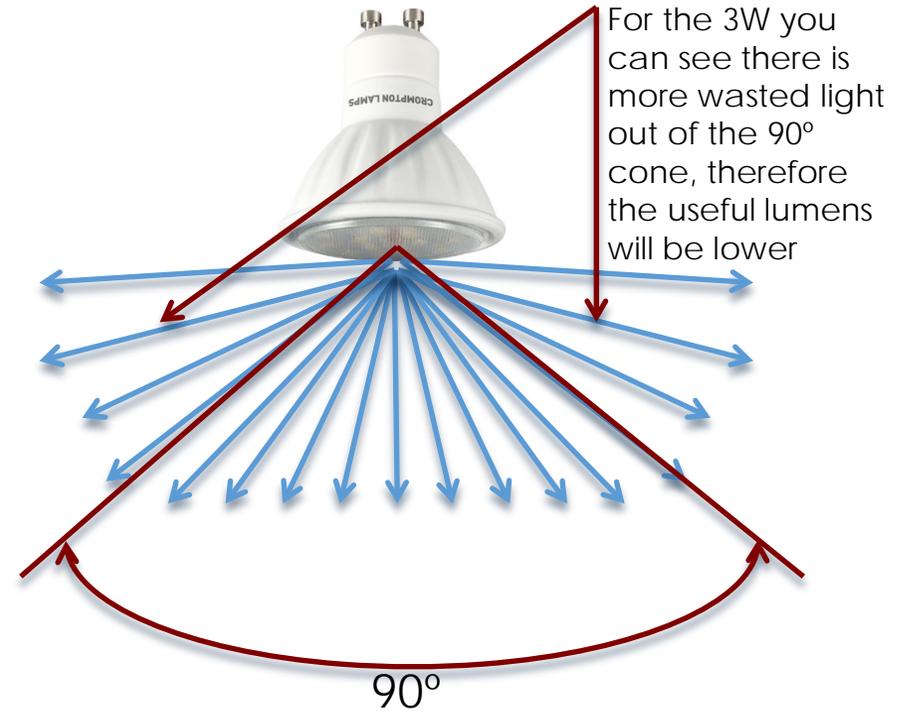


Comparing Useful Lumen

The EU have decided to draw an imaginary cone in front of the reflectors and only measure the light given off in this imaginary cone...



4W COB – Useful Lumens – 200lm



3W SMD – Useful Lumens – 175lm

Both lamps are viable and have different situational benefits. A 3W SMD might be useful in a bar fitting that is lighting a room and a 4W COB better for lighting objects or in banks of ceiling fittings. Often it is just customer preference. **That is Useful Lumens.**

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