

## Purpose

I created this document to develop an understanding of the lux values correspond to PPF values. Lux meters don't measure PAR so conversion factors have to be used. This document tabulates those values for a handful of grow lights.

## Discussion

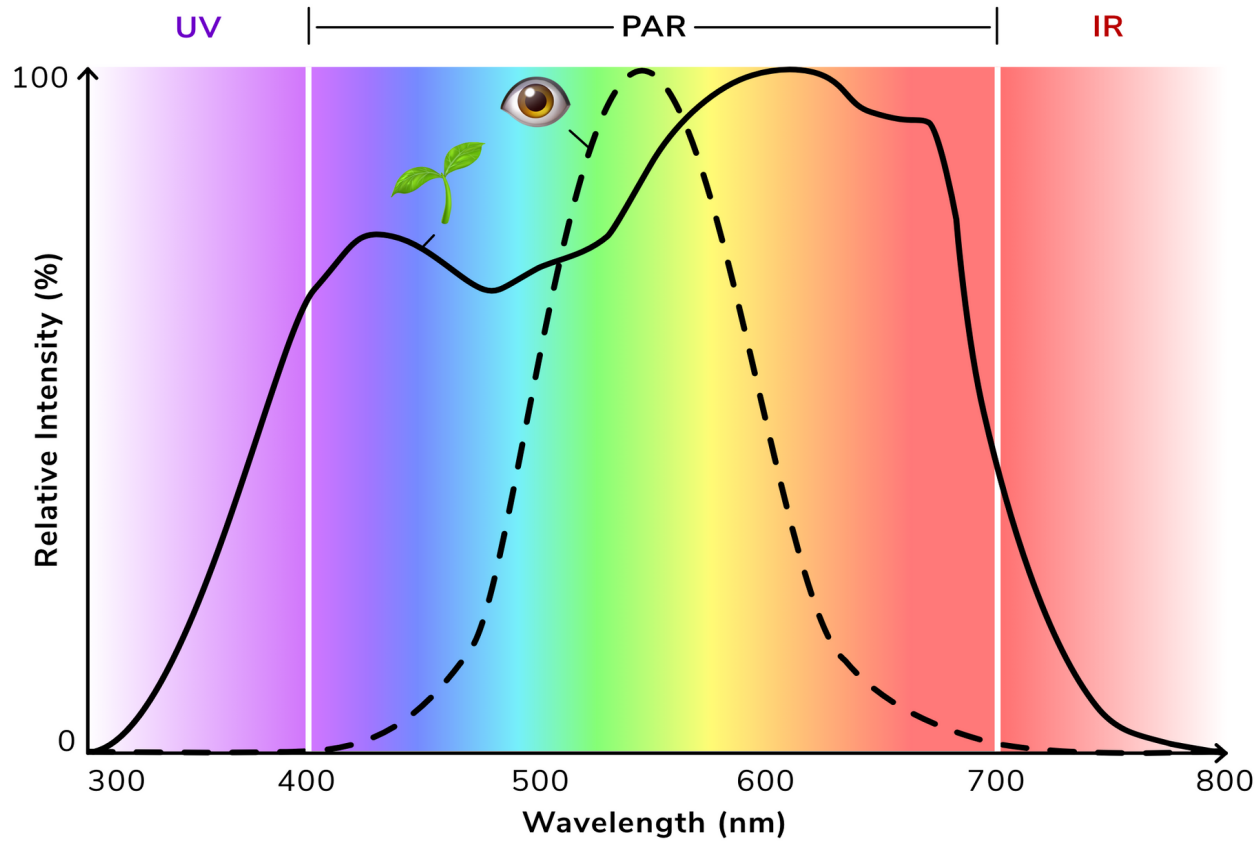
The baseline I've used is the Growcraft Full Cycle light. The reason I've used that is that the manufacturer publishes the data from third party testing, as well as because it's a light that I use. There's no reason to not substitute your own light and its values. Based on the results, it appears that using a simple conversion factor *will* provide an accurate estimate of PPF. The most common factor that I've seen is 0.015. Per the table below, that will result in PPF values at are about 8% lower than the baseline whereas the values in "0.016 Factor" are significantly closer to the baseline light.

## Sources

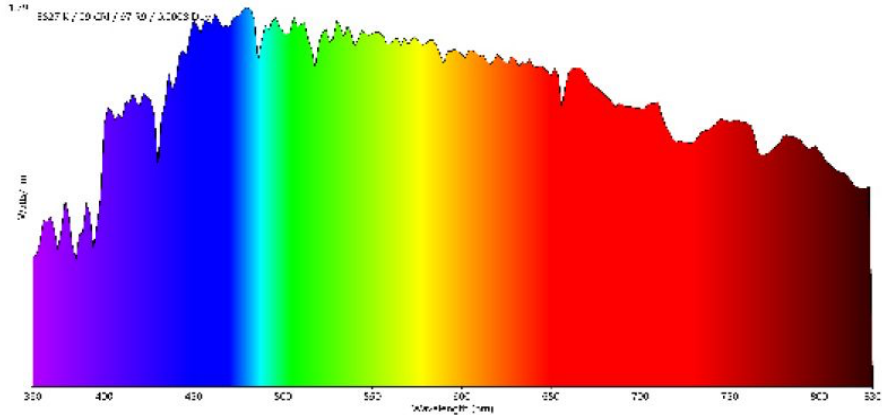
In the case of Growcraft, the values shown here are derived from third party laboratory testing. At max wattage, each light bar is receiving 0.88 amps which is the average of the reported amperage values. On that basis, the average of the factor values was used. In the case of HLG, the values shown here are based on conversion factors on their website.

Lux vs PPF ( $\mu\text{mols}$ )							
Source/Lumens	10,000	20,000	30,000	40,000	50,000	60,000	70,000
Mogul base HPS	122	244	366	488	610	732	854
Dual Ended HPS	130	260	390	520	650	780	910
Rapid LED Royal Blue Puck (460nm)	130	260	390	520	650	780	910
Cool white flourescent	135	270	405	540	675	810	945
QB 288 V2 4000K	144	288	431	575	719	863	1,007
Vipar Spectra XS-1500	145	290	435	580	725	870	1,015
QB 288 V2 3000K	146	291	437	583	729	874	1,020
0.015 Factor	150	300	450	600	750	900	1,050
QB 96 Elite V2	151	301	452	602	753	903	1,054
CMH @ 4200 K	154	308	462	616	770	924	1,078
QB 288 V2 Rspec	155	310	465	620	775	929	1,084
0.016 Factor	160	320	480	640	800	960	1,120
Growcraft Full Cycle	162	325	487	650	812	974	1,137
QB 648 Diablo	163	327	490	653	816	980	1,143
0.017	163	327	490	653	816	980	1,143
CMH @ 3100 K	170	340	510	680	850	1,020	1,190
Sunlight	185	370	555	740	925	1,110	1,295

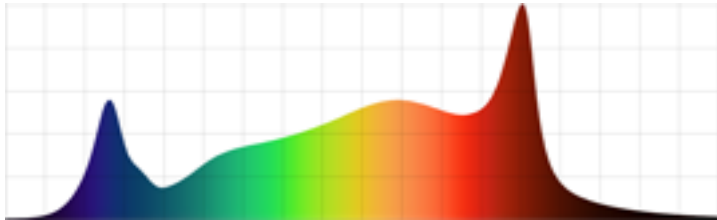
# Light Meter vs PAR



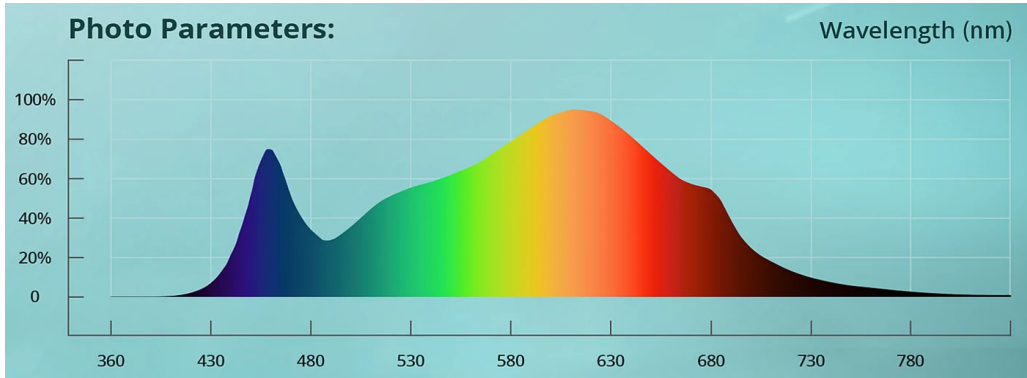
## Sunlight Spectrum



## Growcraft Full Cycle/Flower Spectrum



## Vipar Spectra XS-1500 Spectrum



<b>Name</b>	<b>Factor</b>
0.015 Factor	0.0150
0.016 Factor	0.0160
CMH @ 3100 K	0.0170
CMH @ 4200 K	0.0154
Cool white flourescent	0.0135
Dual Ended HPS	0.0130
Growcraft X3 flower	0.0000
Mogul base HPS	0.0122
QB 288 V2 3000K	0.0146
QB 288 V2 4000K	0.0144
QB 288 V2 Rspec	0.0155
QB 648 Diablo	0.0163
QB 96 Elite V2	0.0151
Sunlight	0.0185
Vipar Spectra XS-1500	0.0145
Rapid LED Royal Blue Puck	0.0130

HLG values are available here:

<https://horticulturelightinggroup.com/blogs/calculators/converting-lux-to-ppfd>

Growcraft values are available here

<https://chilledgrowlights.com/independent-lab-reports>

<b>Amps</b>	<b>PPF</b>	<b>Lumens</b>	<b>Factor</b>	<b>Growcraft 10K PPFD</b>
0.35	48.59	3007.10	0.0162	
0.70	95.99	5917.84	0.0162	
1.05	142.63	8773.21	0.0163	0.0162
1.40	188.04	11542.16	0.0163	
2.10	274.59	16807.14	0.0163	
2.50	322.74	19723.16	0.0164	
2.80	357.44	21819.07	0.0164	
3.13	393.87	24021.04	0.0164	
3.50	435.42	26526.90	0.0164	

Vipar Spectra XS-1500 spectrum is available here:

<https://www.viparspectra.com/products/xs-series-xs1500>

<b>Version</b>	<b>Date</b>	<b>Comment</b>
1.01	12/6/22	Added Vipar Spectra XS-1500 Added RAPID LED Royal Blue Puck