Grow Light Technical Comparison

Horticultural Lighting Group HLG-550
vs
Inda-Gro Impact Series 151-740

The International Artificial Grow Light Association exists as a private Facebook Group whose members consist of anyone who has an abiding interest in plant lighting. As a group we are technologically agnostic. If there is a product or technology that improves our garden experience in terms of crop quality and yield, we want to know about it and share it with our members.

There are a wide number of choices that a grower has when deciding which lighting technology and what brand deserves that vaunted spot above their plants. In the interest of providing the grower with practical information that allows them to compare these technologies and brands we have asked grow light manufacturers, who have submitted their lights for 3rd party testing, to allow us to post those results in a format that allows for an unbiased comparative review of their products performance characteristics. In these comparisons we will not accept any products based strictly on manufacturer claims or if their products have not been 3rd party tested.

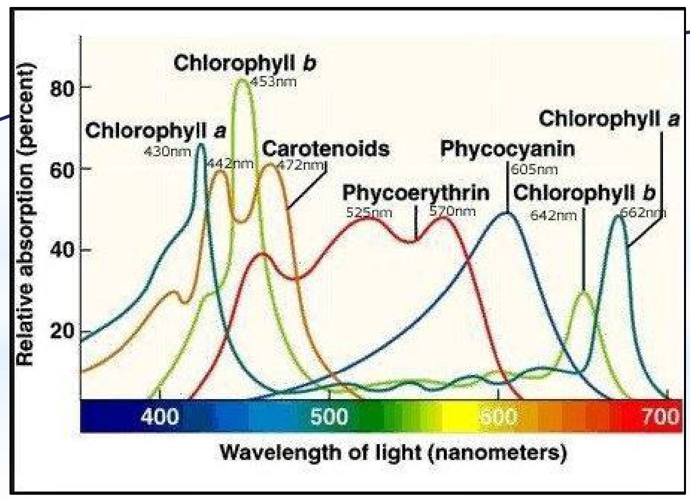
The basis of these reviews is to compare the operating characteristics of the products in terms of emitted spectrums, total output, area of coverage, actual consumed wattage, added value features and price. To see the products as well as the full 3rd party lab reports that are used in the development of this report go to:

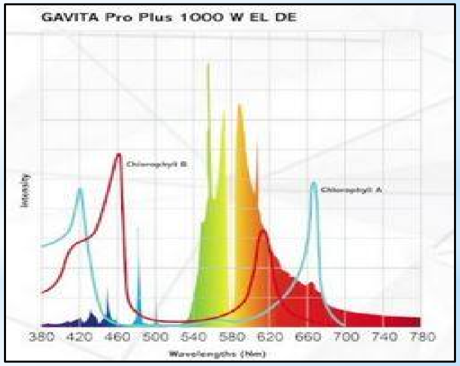
HLG-550: https://horticulturelightinggroup.com/collections/lamps/products/hlg-550
Light Lab no 101705401: https://cdn.shopify.com/s/files/1/1538/8585/files/L101705401.pdf?12227503688760624565

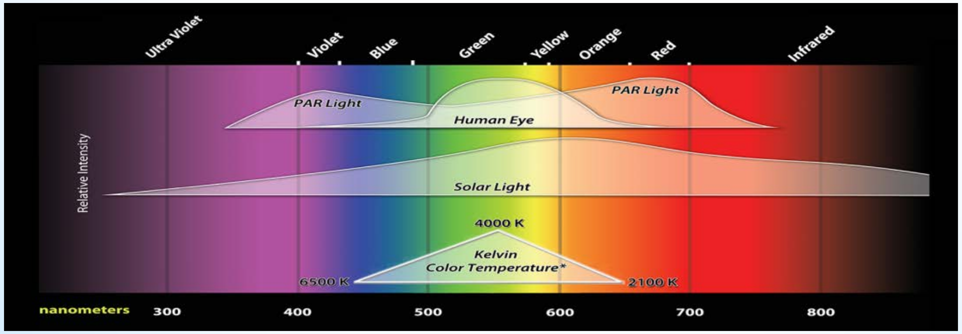
Impact 151-740: http://inda-gro.com/IG/sites/default/files/pdf/ImpactSeries10.pdf
Light Lab no 111700301(Flower): http://inda-gro.com/IG/sites/default/files/pdf/HighFlowerPAR-L111700301.pdf
Light Lab no 111700303(Vegetative): http://inda-gro.com/IG/sites/default/files/pdf/HighVegPAR-L111700303.pdf

Plant Spectrums 101

When considering artificial light sources, it's important to first understand what spectrums of light plants require for certain chemical processes. In this graph we see the various regions within the Photosynthetic Active Regions (PAR) that ideally we would want our artificial light to emit in order to satisfy our plants basic photosynthetic needs. When flowering plants are exposed to these spectrums it benefits us in both crop quality and yields.







PAR refers to the spectrums that fall between 400-700nm and have the greatest influence on a plants photosynthetic processes.

High Pressure Sodium lamps have long been the growers favorite lamp for flowering plants but as you can see by the Spectral Power Distribution (SPD) chart, these lamps emit a narrow spectrum and require supplemental lighting that emits in the UV-G (400-540nm) regions for full flower development.

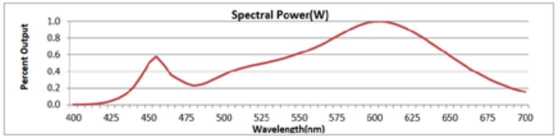
Comparing
Spectral Power Distribution

Here we will compare the emitted spectrums of the HLG-550 and Impact 151-740 to see where these lights emit their spectrums. The HLG-550 has one SPD which is used for Veg and Flower. The Impact 151-740 can be switched between Veg and Flower so both SPD reports have been included for this analysis.

LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Horticulture Lighting Group
Model No: HLG-550

Report No: L101705401
NVLAP TESTING
NVLAP LAB CODE 200927-0



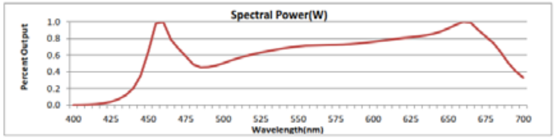
PPF (µmol/s-nm) distribution

Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm
400	1.01E-01	460	2.89E+01	520	3.25E+01	580	6.61E+01	640	5.98E+01	700	1.41E+01
410	3.12E-01	470	1.86E+01	530	3.57E+01	590	7.41E+01	650	5.02E+01		
420	1.29E+00	480	1.45E+01	540	3.96E+01	600	7.88E+01	660	4.07E+01		
430	4.33E+00	490	1.78E+01	550	4.45E+01	610	7.91E+01	670	3.19E+01		
440	1.23E+01	500	2.38E+01	560	5.03E+01	620	7.52E+01	680	2.46E+01		
450	2.94E+01	510	2.90E+01	570	5.77E+01	630	6.84E+01	690	1.87E+01		

LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Impact Series LED Grow Light
PAR Spectral and PPF Distribution
Model No 151-740
Tested @ High Flower Setting

Report No: L111700301
NVLAP TESTING
NVLAP LAB CODE 200927-0



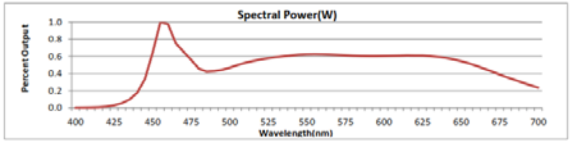
PPF (µmol/s-nm) distribution

Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm
400	9.44E-02	460	5.52E+01	520	3.83E+01	580	5.09E+01	640	6.58E+01	700	2.80E+01
410	2.73E-01	470	3.85E+01	530	4.14E+01	590	5.26E+01	650	7.20E+01		
420	1.09E+00	480	2.82E+01	540	4.43E+01	600	5.50E+01	660	7.94E+01		
430	3.66E+00	490	2.69E+01	550	4.67E+01	610	5.76E+01	670	7.26E+01		
440	1.09E+01	500	3.02E+01	560	4.84E+01	620	6.01E+01	680	6.13E+01		
450	3.49E+01	510	3.47E+01	570	4.96E+01	630	6.25E+01	690	4.22E+01		

LIGHT LABORATORY INC.
8165 E Kaiser Blvd. Anaheim, CA 92808
www.lightlaboratory.com

Impact Series LED Grow Light
PAR Spectral and PPF Distribution
Model No 151-740
Tested @ High Vegetative Setting

Report No: L111700303
NVLAP TESTING
NVLAP LAB CODE 200927-0



PPF (µmol/s-nm) distribution

Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm	Wavelength	µmol/s-nm
400	7.05E-02	460	4.82E+01	520	3.14E+01	580	3.78E+01	640	4.00E+01	700	1.76E+01
410	1.76E-01	470	3.31E+01	530	3.36E+01	590	3.82E+01	650	3.80E+01		
420	6.76E-01	480	2.35E+01	540	3.54E+01	600	3.89E+01	660	3.47E+01		
430	2.47E+00	490	2.26E+01	550	3.68E+01	610	3.98E+01	670	3.04E+01		
440	8.37E+00	500	2.51E+01	560	3.75E+01	620	4.06E+01	680	2.60E+01		
450	3.10E+01	510	2.87E+01	570	3.77E+01	630	4.08E+01	690	2.17E+01		

Next we compare the emitted spectrums within 10nm regions. The Impact 151-740 is tested in the High Flower setting.

Mfg. Regional Spectral Comparison: 400-500nm			
Model No: HLG-550		Model No: Impact 151-740	
Wavelength	µmol/s-nm	Wavelength	µmol/s-nm
400	1.01E-01	400	9.44E-02
410	3.12E-01	410	2.73E-01
420	1.29E+00	420	1.09E+00
430	4.33E+00	430	3.66E+00
440	1.23E+01	440	1.09E+01
450	2.94E+01	450	3.49E+01
460	2.89E+01	460	5.52E+01
470	1.86E+01	470	3.85E+01
480	1.45E+01	480	2.82E+01
490	1.78E+01	490	2.69E+01
500	2.38E+01	500	3.02E+01
Regional Total:	**24.28**	**Regional Total:**	**39.4**

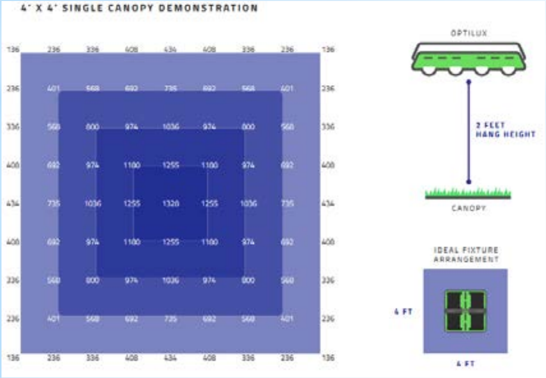
Mfg. Regional Spectral Comparison: 510-600nm			
HLG-550		Impact 151-740	
Wavelength	µmol/s-nm	Wavelength	µmol/s-nm
510	2.90E+01	510	3.47E+01
520	3.25E+01	520	3.83E+01
530	3.57E+01	530	4.14E+01
540	3.96E+01	540	4.43E+00
550	4.45E+01	550	4.67E+01
560	5.03E+01	560	4.84E+01
570	5.77E+01	570	4.96E+01
580	6.61E+01	580	5.09E+01
590	7.41E+01	590	5.26E+01
600	7.88E+01	600	5.50E+01
Regional Total:	**50.83**	**Regional Total:**	**46.19**

Mfg. Regional Spectral Comparison: 610-700nm			
HLG-550		Impact 151-740	
Wavelength	µmol/s-nm	Wavelength	µmol/s-nm
610	7.91E+01	610	5.76E+01
620	7.52E+01	620	6.01E+01
630	6.84E+01	630	6.25E+01
640	5.98E+01	640	6.58E+01
650	5.02E+01	650	7.20E+01
660	4.07E+01	660	7.94E+01
670	3.19E+01	670	7.26E+01
680	2.46E+01	680	6.13E+01
690	1.87E+01	690	4.22E+01
700	1.41E+01	700	2.80E+01
Regional Total:	**46.27**	**Regional Total:**	**60.15**

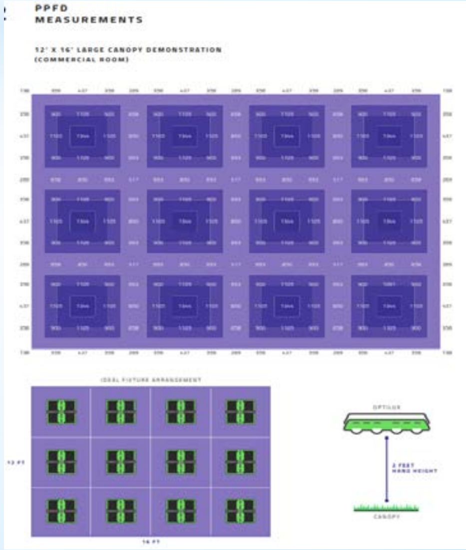
Understanding Area Coverage Values

When comparing the AREA COVERAGE for any grow lighting technology or brand there are two key bits of information that you must have in order for you to make an informed decision as to whether or not a particular grow light fits your needs. You'll need to know the lights INTENSITY VALUES over the stated Area Coverage and the UNIFORMITY VALUES over that coverage area.

We usually have to rely on the Point by Point INTENSITY VALUES that have been provided by the manufacturers for the recommended Area Coverage and the Lamp to Canopy spacing. If 3rd party Point by Point documentation has been provided we always prefer those values so as to allay any concerns that the prospective buyer might have that the numbers may be exaggerated.



When considering how accurate any manufacturers Point by Point values are we always recommend questioning their Technical Specifications if the values being represented are identically opposite around the entire Area Coverage. In the real world of taking actual physical measurements this just does not happen.

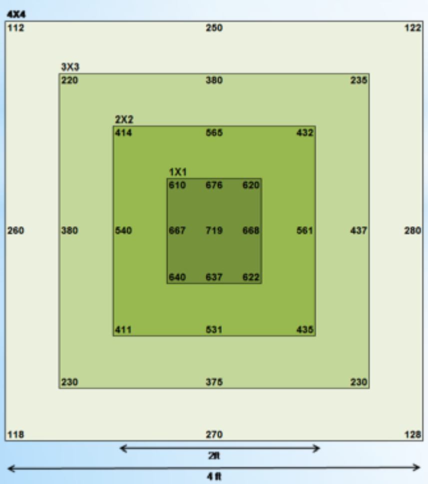


If any grow light company relies on slick marketing materials which go on to claim how advanced their products are, or how they make the 'Greatest Grow Light in the World', we would simply ask that they confirm those statements by providing 3rd party test results of their lights performance. Providing manipulated or exaggerated data, that mathematically works out in their favor, does no one any good and should be rejected until such independent tests, from certified testing labs, are made publicly available.

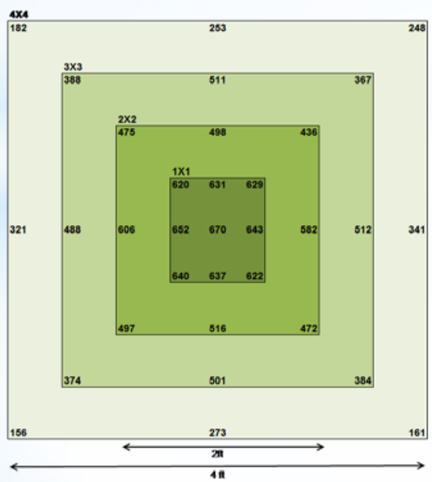
Comparing Area Coverage Intensity Values

INTENSITY VALUES for plant lighting are measured as a Photosynthetic Photon Flux Density (PPFD) which is a metric that takes into account the intensities of the emitted photons that fall between the 400-700nm or the Photosynthetic Active Region (PAR) within the spectrum. A PPFD value is shown as a micromole per meter squared per second (µMol/m2-s) and will be discussed in greater detail later in this presentation.

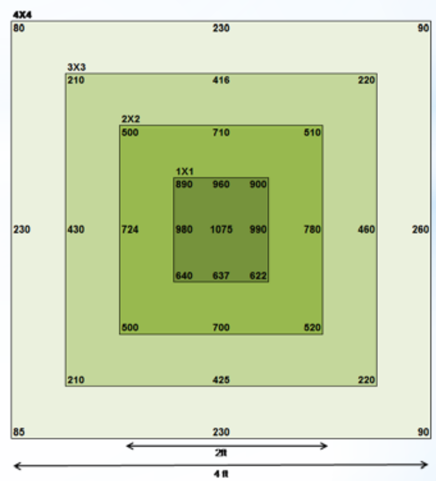
PPFD should not be confused with Photosynthetic Photon Flux (PPF) which represents the total number of photons being emitted from the light source. PPF should be measured in a 3rd party lab with the light suspended in a calibrated Integrating Sphere and are shown on the Summary Analysis page of this presentation. On the other hand PPFD is a field measurement that can be easily performed by the grower using an inexpensive quantum meter to determine if the light intensities are depreciating and if the lamp or even the light itself needs to be replaced to maintain optimum crop production values.



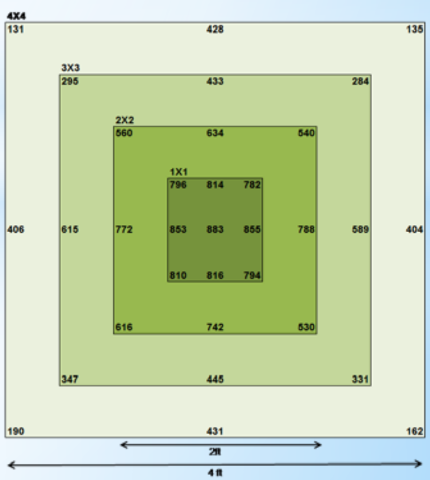
HLG-550
4' x 4' @ 24" Lamp to Canopy
Average @ 4': 192 µMol/m2-s
Average @ 3': 285 µMol/m2-s
Average @ 2': 486 µMol/m2-s
<u>Average @ 1': 654 µMol/m2-s</u>
Average Total: 1617 µMol/m2-s
Area Average PPFD: 404 µMol/m2-s



Impact 151-740
4' x 4' @ 24" Lamp to Canopy
Average @ 4': 242 µMol/m2-s
Average @ 3': 441 µMol/m2-s
Average @ 2': 510 µMol/m2-s
<u>Average @ 1': 638 µMol/m2-s</u>
Average Total: 1831 µMol/m2-s
Area Average PPFD: 458 µMol/m2-s



HLG-550
4' x 4' @ 18" Lamp to Canopy
Average @ 4': 162 µMol/m2-s
Average @ 3': 324 µMol/m2-s
Average @ 2': 618 µMol/m2-s
<u>Average @ 1': 953 µMol/m2-s</u>
Average Total: 2057 µMol/m2-s
Area Average PPFD: 514 µMol/m2-s



Impact 151-740
4' x 4' @ 18" Lamp to Canopy
Average @ 4': 286 µMol/m2-s
Average @ 3': 417 µMol/m2-s
Average @ 2': 648 µMol/m2-s
<u>Average @ 1': 822 µMol/m2-s</u>
Average Total: 2173 µMol/m2-s
Area Average PPFD: 543 µMol/m2-s

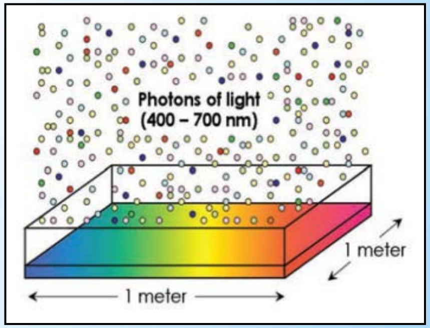
How Much Light do Plants Need? Understanding DLI and Moles/Day

Now that we have looked into spectrum, intensity and uniformity we need to look at our plants daily lighting requirements. This value is referred to as the plants Daily Light Integral (DLI) and as it relates to artificial grow lights, it represents the number of photons the light produces that must direct to the leaf surfaces where it can be absorbed. But first let's review what PPFD µMole intensities are and how they will be converted to Moles/Day which is what ultimately tells us if there is enough light being produced to meet our crops optimum daily lighting requirements.

When you see **µMole**, pronounced micromole, it is used as a unit of measuring the net energy in plant lighting and represents the large number of photons that fall within the PAR regions of 400-700nm spectrums over a fixed area. To be precise when you see µMole it is being used as an abbreviation for **µMol/M²S** that is the unit of measure for PPFD. The µ symbol derives from the ancient Greek alphabet, letter Mµ and is used in modern mathematics to represent the term micro or $1/1{,}000{,}000^{th}$, therefore a µMole is $1/1{,}000{,}000^{th}$ of a Mole.

The term **Mole** is a unitless large number (number value only) often used in physics and chemistry, it is also known as Avogadro's number, 6.022×10^{23}. The Mole is based on the quantity of elemental atoms or molecules, such that the net weight of that quantity equals the Atomic Weight or the Molecular Weight in Grams. If you had 6.022×10^{23} atoms of a particular element, its weight in grams would be equal to its atomic weight from the periodic table. A µMole is a millionth of a Mole or 6.022×10^{17}.

The advantage of using Moles/Day as a daily accumulation of light over that of an instantaneous PPFD µMole reading can be demonstrated with an analogy; To determine how much rain fell during the course of a day, you would place a bucket outdoors and record the volume of water collected over that day. Whereas, recording the intensity of rainfall at one instant, e.g., the raindrops per second, would be of little value. The amount of rain accumulated over the day would be the equivalent of how many photons struck a meter-squared or what you now know as a Moles/Day value.



Moles/Day Values

For those of you who like to exercise your mathematical skills and when the indoor plant lighting levels are constant over the photoperiod, you can convert a µMole into a Mole by using this formula:

$\mu Mol/M^2S \times 3600\ s/hr \times photoperiod(hrs/day) \div 1{,}000{,}000\ \mu Mole/Mole = Mol/M^2Day$

Or for those of you who may be somewhat less inclined to run the math, you can always refer to this chart which shows the round number conversion from µMoles to Moles based on the number of hours the plants will receive that constant value PPFD intensity.

Moles per Day

(per Square Meter)

Hours/day	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
uMol/M^2-S																	
200	**6**	**6**	**7**	**8**	**9**	**9**	**10**	**11**	**12**	**12**	**13**	**14**	**14**	**15**	**16**	**17**	**17**
300	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**21**	**22**	**23**	**24**	**25**	**26**
400	**12**	**13**	**14**	**16**	**17**	**19**	**20**	**22**	**23**	**24**	**26**	**27**	**29**	**30**	**32**	**33**	**35**
500	**14**	**16**	**18**	**20**	**22**	**23**	**25**	**27**	**29**	**31**	**32**	**34**	36	38	40	41	43
600	**17**	**19**	**22**	**24**	**26**	**28**	**30**	**32**	**35**	37	39	41	43	45	48	50	52
700	**20**	**23**	**25**	**28**	**30**	**33**	**35**	38	40	43	45	48	50	53	55	58	60
800	**23**	**26**	**29**	**32**	**35**	37	40	43	46	49	52	55	58	60	63	66	69
900	**26**	**29**	**32**	36	39	42	45	49	52	55	58	62	65	68	71	75	78
1000	**29**	**32**	36	40	43	47	50	54	58	61	65	68	72	76	79	83	86
1100	**32**	36	40	44	48	51	55	59	63	67	71	75	79	83	87	91	95
1200	**35**	39	43	48	52	56	60	65	69	73	78	82	86	91	95	99	104
1300	37	42	47	51	56	61	66	70	75	80	84	89	94	98	103	108	112
1400	40	45	50	55	60	66	71	76	81	86	91	96	101	106	111	116	121
1500	43	49	54	59	65	70	76	81	86	92	97	103	108	113	119	124	130

Bolded values represent typical target DLI amounts

500 uMole represents a typical desireable light intensity for indoor growing.

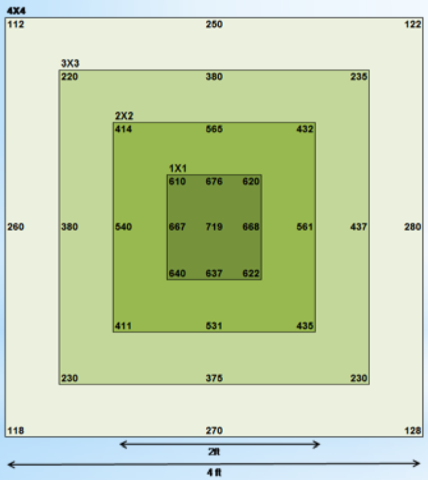
1000 uMole is a high level intensity for both indoor and greenhouse supplemental lighting may likely result in diminishing returns.

1500 uMoles is a typical plant saturation level for high DLI crops light is of no or very little benefit.

2000 uMole is a typical maximum natural sun output on a clear day at astronomical noon.

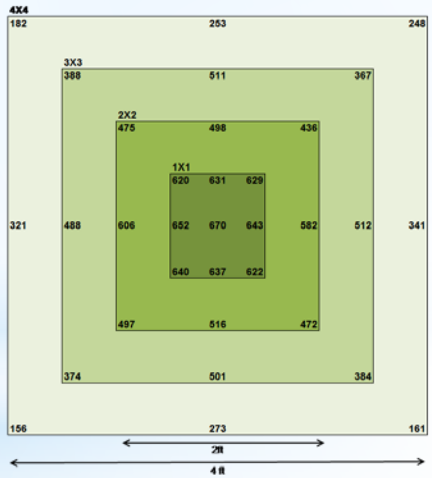
How Much Light do Plants Need? Comparing Moles/Day Values

Now that we have looked into spectrum, intensity, uniformity and DLI we can take another look at these charts and see what these lights will provide us in terms of a Moles/Day value over the stated coverage areas by using the conversion formula for µMole to Mole over a 12 hour photoperiod. If the grower knows what his plants Moles/Day requirements are this is where you can determine if the light you're considering is up for the task.



HLG-550
4' x 4' @ 24" Lamp to Canopy
Average @ 4': 192 µMol/m2-s
Average @ 3': 285 µMol/m2-s
Average @ 2': 486 µMol/m2-s
Average @ 1': 654 µMol/m2-s
Average Total: 1617 µMol/m2-s
Area Average PPFD: 404 µMol/m2-s
PALC (654/192): 109%
12 Hour DLI: 17.45 Moles/Day

23%»
43%»
5%»
«2%



Impact 151-740
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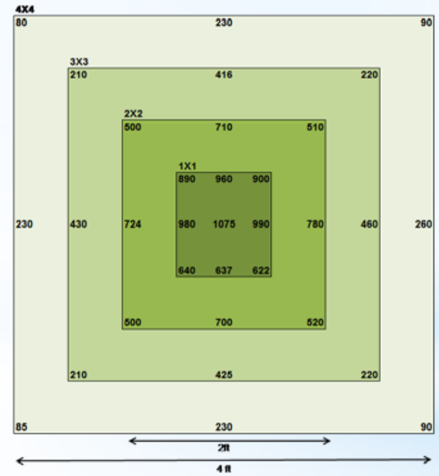
Average @ 4': 242 µMol/m2-s
Average @ 3': 441 µMol/m2-s
Average @ 2': 510 µMol/m2-s
Average @ 1': 638 µMol/m2-s
Average Total: 1831 µMol/m2-s
Area Average PPFD: 458 µMol/m2-s
PALC (638/242): 90%
12 Hour DLI: 19.78 Moles/Day



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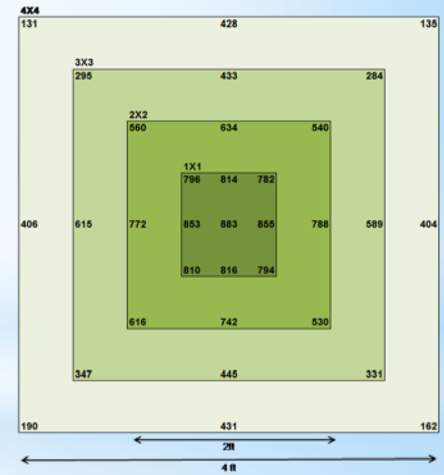
4' x 4' @ 18" Lamp to Canopy
Average @ 4': 162 µMol/m2-s
Average @ 3': 324 µMol/m2-s
Average @ 2': 618 µMol/m2-s
Average @ 1': 953 µMol/m2-s
Average Total: 2057 µMol/m2-s
Area Average PPFD: 514 µMol/m2-s
PALC (953/162): 142%
12 Hour DLI: 22.20 Moles/Day

55%»
25%»
5%»
«14%



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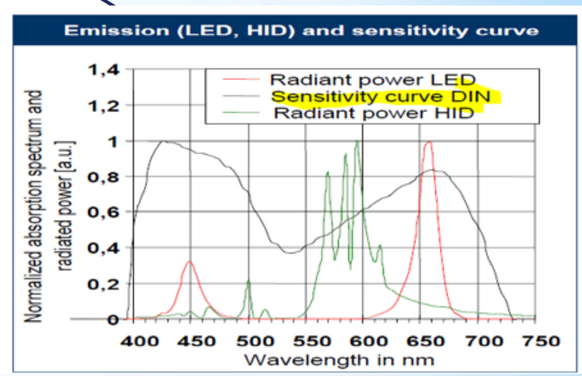
Average @ 1': 822 µMol/m2-s
Average Total: 2173 µMol/m2-s
Area Average PPFD: 543 µMol/m2-s
PALC (822/286): 97%
12 Hour DLI: 23.45 Moles/Day

In a 4' x 4' area @ 24" lamp to canopy spacing, over a 12 hour photoperiod, the Impact will deliver 12.5% more light to the canopy than the HLG-550. In addition the overall greater intensities of the Impact, especially at the 3' and 4' regions will also improve canopy penetration over the HLG-550 for increased lower flower development.

In a 4' x 4' area @ 18" lamp to canopy spacing, over a 12 hour photoperiod, the Impact will deliver 5.5% more light to the canopy than the HLG-550. While this does not appear to be a significant difference in overall area intensities there are significant intensity differences in the outside area coverages which favor lower increased flowering and yields.

Where PPFD Meets Spectrum

Excuse me Professor Budswell but now that I've got a better understanding of what a µMole and a Mole is, I was wondering how reliable that PPFD number is when it is based on a photons intensity that falls ANYWHERE within the PAR region of 400-700nm. It would seem to me that since a blue photon carries more energy than a red photon there should be some kind of weighted value to photons that fall within this region. Is there such a thing?



You really raise an excellent point here Ms. Botwin that to this day remains an area of contention within the grow light industry. Here's why;

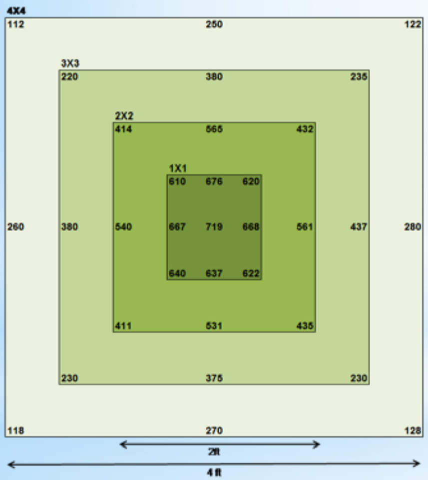
Unlike a Lumen which is photopically corrected for human vision we don't have a comparable metric in plant lighting. There is no weighted photon value regardless of whether or not that photon is blue or red. What this means is that the buyer really has to look carefully at the manufacturers Spectral Distribution Graph to see what spectrums those photons are emitted in. It is precisely because there is no weighted value to these PAR photons that some manufacturers will omit large regions of the spectrum so they can claim really high efficiencies in µMole/Joule or Watts but are doing so at the expense of spectrums that our plants would want to have in order to realize their full quality and yields from having been exposed to those broad spectrums in nature. Simply put you cannot rely on a PPFD value alone to determine if one light is better than another at meeting your plants photosynthetic needs. If you buy based solely on that PPFD value and are not concerned with the emitted spectrums you are likely to going to be pretty disappointed with your crop performance.

As a result of there not being a generally accepted industry standard that weights photons based on their emitted spectrums many manufacturers will refer to the German DIN Standard 5031-10 when it comes to how their lights perform within that plant sensitivity curve.

Here you can see how on paper the LED light, shown in the red curve, will operate at extremely high efficiencies but in doing so it only concentrates on the two chlorophyll A and B regions within the plants Sensitivity Curve . This is a classic example of how an LED grow lighting manufacturer can mislead the buyer by only concentrating on one aspect of what their light can do. Caveat Emptor!

Comparing Moles/Day and Canopy Penetration Values

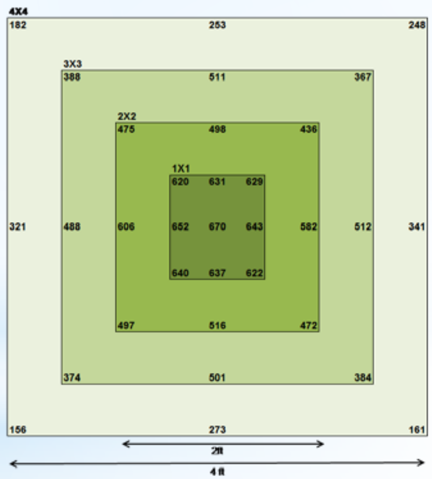
Now that we have looked into spectrum, intensity, uniformity and DLI we can take another look at these charts and see what these lights will provide us in terms of a Moles/Day value over the stated coverage areas by using the conversion formula for µMole to Mole over a 12 hour photoperiod. If the grower knows what his plants Moles/Day requirements are this is where you can determine if the light you're considering is up for the task.



HLG-550
4' x 4' @ 24" Lamp to Canopy

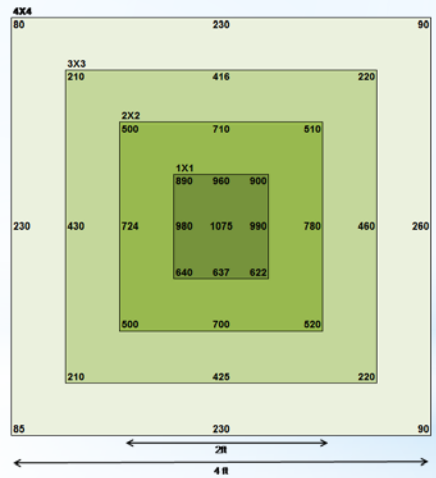
Average @ 4': 192 µMol/m2-s
Average @ 3': 285 µMol/m2-s
Average @ 2': 486 µMol/m2-s
Average @ 1': 654 µMol/m2-s
Average Total: 1617 µMol/m2-s
Area Average PPFD: 404 µMol/m2-s
PALC (654/192): 109%
12 Hour DLI: 17.45 Moles/Day

23%»
43%»
5%»
«2%



Impact 151-740
4' x 4' @ 24" Lamp to Canopy

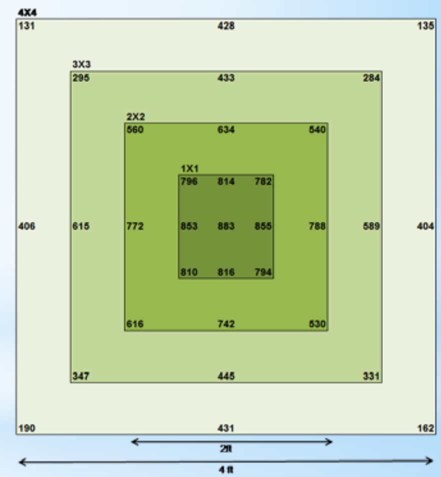
Average @ 4': 242 µMol/m2-s
Average @ 3': 441 µMol/m2-s
Average @ 2': 510 µMol/m2-s
Average @ 1': 638 µMol/m2-s
Average Total: 1831 µMol/m2-s
Area Average PPFD: 458 µMol/m2-s
PALC (638/242): 90%
12 Hour DLI: 19.78 Moles/Day



HLG-550
4' x 4' @ 18" Lamp to Canopy

Average @ 4': 162 µMol/m2-s
Average @ 3': 324 µMol/m2-s
Average @ 2': 618 µMol/m2-s
Average @ 1': 953 µMol/m2-s
Average Total: 2057 µMol/m2-s
Area Average PPFD: 514 µMol/m2-s
PALC (953/162): 142%
12 Hour DLI: 22.20 Moles/Day

55%»
25%»
5%»
«14%



Impact 151-740
4' x 4' @ 18" Lamp to Canopy

Average @ 4': 286 µMol/m2-s
Average @ 3': 417 µMol/m2-s
Average @ 2': 648 µMol/m2-s
Average @ 1': 822 µMol/m2-s
Average Total: 2173 µMol/m2-s
Area Average PPFD: 543 µMol/m2-s
PALC (822/286): 97%
12 Hour DLI: 23.45 Moles/Day

In a 4' x 4' area @ 24" lamp to canopy spacing, over a 12 hour photoperiod, the Impact will deliver 12.5% more light to the canopy than the HLG-550. In addition the overall greater intensities of the Impact, especially at the 3' and 4' regions will also improve canopy penetration over the HLG-550 for increased lower flower development.

In a 4' x 4' area @ 18" lamp to canopy spacing, over a 12 hour photoperiod, the Impact will deliver 5.5% more light to the canopy than the HLG-550. While this does not appear to be a major difference in overall area intensities there are large differences in the outside area coverages which favor the Impact over the HLG-550.

Technical and Feature Comparisons

This page will summarize what we know to be additional technical aspects and features of the lights not addressed in the previous pages.

	HLG-550	Impact 151-740
Designed to Replace:	1000 watt HID	1000 watt HID
Type Light:	LED COB Style	LED SMD Style
PAR 400-700nm Totals:	121.38	145.74
Total Photosynthetic Photon Flux (PPF 380-780nm):	1159.35	Not Tested
Total PPF 400-700nm:	Not Tested	1287.25
Total Actual Wattage:	507.30	755.60
Weight:	17 lbs	33 lbs
Cooling:	Passive	Passive
Thermal Contribution:	1730 btu/hr	2575 btu/hr
Recommended Area Coverage:	4’ x 4’ (16 sq-ft)	4’ x 5’ (20 sq-ft)
Recommended Lamp to Canopy Spacing:	18-24”	16”-30”
Spectrum Modes:	Fixed for Veg/Flower	Adjustable for Veg/Flower
Smart Technology Software Features:	None	Yes/WIFI Controls/ADR
Options:	None	UV-Pontoons
Technical Upgrade or Buy Back Programs:	None	Yes
Additional Standard Features:	None	730nm Phytochrome Switch @ Lights Out
Warranty:	5 years	5 years
Price:	$1049	$1850

HLG-550 Video Link: https://www.facebook.com/horticulturelightgroup/videos/281141928961622/
Impact Video Link: https://www.youtube.com/watch?time_continue=2&v=s5E5YpUWN7M