

## PPFD Conversion Guide

The following calculations can be used to convert Foot-candles (FC) and Lux into PPFD (Photosynthetic Photon Flux Density); measured in  $\mu\text{mol}/\text{m}^2 \text{ s}^{-1}$  and expressed as micromoles per meter squared per second. PPFD is the correct method to express the intensity of PAR (400-700nm) light that is instantaneously landing on a single spot in a plant canopy. The correct instrument to measure PPFD is called a quantum meter; like the LBGQM from Hydrofarm.

| Lux to PPFD (μmol m <sup>-2</sup> s <sup>-1</sup> )                                                                                                                    |        | PPFD (μmol m <sup>-2</sup> s <sup>-1</sup> ) to Lux                                                                                                              |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Sunlight                                                                                                                                                               | 0.0185 | Sunlight                                                                                                                                                         | 54 |
| Cool White Fluorescent                                                                                                                                                 | 0.0165 | Cool White Fluorescent                                                                                                                                           | 74 |
| Mogul Base HPS                                                                                                                                                         | 0.0122 | Mogul Base HPS                                                                                                                                                   | 82 |
| DE 1000W HPS                                                                                                                                                           | 0.0130 | DE 1000W HPS                                                                                                                                                     | 77 |
| Metal Halide                                                                                                                                                           | 0.0141 | Metal Halide                                                                                                                                                     | 71 |
| Philips 315W Agro 3100K CMH                                                                                                                                            | 0.0170 | Philips 315W Agro 3100K CMH                                                                                                                                      | 59 |
| Philips 315W 4200K CMH                                                                                                                                                 | 0.0154 | Philips 315W 4200K CMH                                                                                                                                           | 65 |
| Multiply the Lux by the conversion factor to get PPFD.<br>For example, full sunlight is 108,000 Lux<br>or 2000 μmol m <sup>-2</sup> s <sup>-1</sup> (108,000 x 0.0185) |        | Multiply the PPFD by the conversion factor to get Lux.<br>For example, full sunlight is 2000 μmol m <sup>-2</sup> s <sup>-1</sup><br>or 108,000 Lux (2000 x 54). |    |
| Conversion data provided by Apogee Instruments, Logan, UT                                                                                                              |        |                                                                                                                                                                  |    |

| Foot-candles (FC) to PPFD (μmol m <sup>-2</sup> s <sup>-1</sup> )                                                                                               |       | PPFD (μmol m <sup>-2</sup> s <sup>-1</sup> ) to Foot-candles (FC)                                                                                               |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Sunlight                                                                                                                                                        | 0.200 | Sunlight                                                                                                                                                        | 5.01 |
| Cool White Fluorescent                                                                                                                                          | 0.146 | Cool White Fluorescent                                                                                                                                          | 6.87 |
| Mogul Base HPS                                                                                                                                                  | 0.131 | Mogul Base HPS                                                                                                                                                  | 7.62 |
| DE 1000W HPS                                                                                                                                                    | 0.141 | DE 1000W HPS                                                                                                                                                    | 7.11 |
| Metal Halide                                                                                                                                                    | 0.152 | Metal Halide                                                                                                                                                    | 6.60 |
| Philips 315W Agro 3100K CMH                                                                                                                                     | 0.184 | Philips 315W Agro 3100K CMH                                                                                                                                     | 5.45 |
| Philips 315W 4200K CMH                                                                                                                                          | 0.167 | Philips 315W 4200K CMH                                                                                                                                          | 6.01 |
| Multiply the FC by the conversion factor to get PPFD.<br>For example, full sunlight is 10,020 FC<br>or 2000 μmol m <sup>-2</sup> s <sup>-1</sup> (10200 x 0.02) |       | Multiply the PPFD by the conversion factor to get FC.<br>For example, full sunlight is 2000 μmol m <sup>-2</sup> s <sup>-1</sup><br>or 10,020 FC (2000 x 5.01). |      |
| Conversion data provided by Apogee Instruments, Logan, UT                                                                                                       |       |                                                                                                                                                                 |      |

| Conversion Table Using the<br>Philips 315W Agro 3100K CMH Lamp |      |       |
|----------------------------------------------------------------|------|-------|
| PPFD                                                           | FC   | Lux   |
| 400                                                            | 2180 | 23600 |
| 500                                                            | 2725 | 29500 |
| 600                                                            | 3270 | 35400 |
| 700                                                            | 3815 | 41300 |
| 800                                                            | 4360 | 47200 |
| 900                                                            | 4905 | 53100 |
| 1000                                                           | 5450 | 59000 |