Horticultural Lighting Test Report

Relevant Standards

Prepared For
TopGrow Lighting
Joseph Hazani
9415 Culver Blvd.
Culver City, CA 90232
United States

Catalog Number
TGT5-24W65K
Order Number
11854719
Test Number
11854719.01B
Revised
2017-07-17
Test Date
2017-07-14

Prepared By
Austin Duff, Technician

Approved By
Eric Gaudreau, Senior Engineering Associate

The results contained in this report pertain only to the tested sample.
This report shall not be reproduced, except in full, without written approval of Underwriters Laboratories.
This report must not be used by the client to claim product certification, approval, or endorsement by
NVLAP, NIST, or any agency of the Federal Government.
Summary of Results

| Parameter        | Value | Test Conditions
|------------------|-------|---------------------|
| Radiant Flux     | 41610 mW | Test Temperature: 25.1 °C
| Luminous Flux    | 12850 lm | Voltage: 120.1 VAC
| Luminaire Efficacy | 125.5 lm/W | Current: 0.9327 A
| CCT              | 6515 K | Power: 102.4 W
| CRI (Ra)         | 84.5 | Power Factor: 0.915
| Chromaticity (x) | 0.3115 | Frequency: 60 Hz
| Chromaticity (y) | 0.3357 | Current THD: 43.6 %
| Chromaticity (u) | 0.1945 |
| Chromaticity (v) | 0.3144 |
| Duv              | 0.0071 |

Test Conditions

- Test Temperature: 25.1 °C
- Voltage: 120.1 VAC
- Current: 0.9327 A
- Power: 102.4 W
- Power Factor: 0.915
- Frequency: 60 Hz
- Current THD: 43.6 %

Absorption correction was employed for this measurement.
Horticultural Lighting - Integrating Sphere
Integrating Sphere Test Conditions

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Voltage</th>
<th>Current</th>
<th>Power</th>
<th>Power Factor</th>
<th>Frequency</th>
<th>Current THD</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.1 °C</td>
<td>120.1 VAC</td>
<td>0.9327 A</td>
<td>102.4 W</td>
<td>0.915</td>
<td>60 Hz</td>
<td>43.6 %</td>
</tr>
</tbody>
</table>

Summary of Results

Radiant Flux: 41.61 Watts
Luminous Flux: 12850 Lumens
PPF (400-700nm): 183.85 Kq µmol
PBAR Flux(350-800nm): 187.65 Kq µmol

Lumens to µmol/sec conversion factor: 0.014307 Kq µmol/µmol/sec

Flux vs Wavelength

Test Number 11854719.01B - Page 3 of 7
**Horticultural Lighting - Definition of Terms**

**Radiant Flux:** The measured radiant power of the test item in units of watts from 350nm to 850 nm.

**Luminous Flux:** The measured radiant power of the test item in units of lumens from 380nm to 780 nm.

**PPF (400-700nm):** Photons absorbed in the wavelength range 400 to 700 nm expressed in units of μmol/sec/W.

**PBAR Flux(350-800nm):** Plant Biologically Active Radiation Flux - Flux from 350 to 800 nm expressed in units of μmol/sec/W. This wavelength range has been identified as important to photosynthetic processes.

**Radiant Efficiency:** The ratio of light flux in watts to electrical input power in watts expressed in percent.

**Luminous Efficacy:** The ratio of light flux in lumens to electrical input power in watts expressed in lm/W.

**PPF Efficacy:** The ratio of photosynthetic photon flux to electrical input power in watts expressed in μmol/sec/W.

**PBAR Efficacy:** The ratio of photon flux in the wavelength range 350 to 800 nm to electrical input power expressed in μmol/sec/W.

**Lumens to μmol/sec conversion factor:** Multiply flux in lumens by this factor to convert to PPF in units of μmol/sec. This conversion factor can also be used to convert illuminance in lux to photosynthetic photon flux density (PPFD).

To convert from footcandles to PPFD first convert the illuminance in fc to lux by multiplying by 10.7639 lux/fc and then use the lumens to μmol/sec conversion factor.

**Note:** This factor applies to the measured spectral distribution only and cannot be applied to other light sources.
Horticultural Lighting - Nadir PPFD versus Mounting Height

<table>
<thead>
<tr>
<th>Mounting Height [Inches]</th>
<th>Nadir PPFD [μmol/sec/m²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>212.10</td>
</tr>
<tr>
<td>18</td>
<td>136.00</td>
</tr>
<tr>
<td>24</td>
<td>93.29</td>
</tr>
<tr>
<td>27</td>
<td>77.25</td>
</tr>
<tr>
<td>30</td>
<td>64.90</td>
</tr>
<tr>
<td>33</td>
<td>54.76</td>
</tr>
<tr>
<td>36</td>
<td>47.59</td>
</tr>
<tr>
<td>48</td>
<td>29.61</td>
</tr>
</tbody>
</table>