

**Report prepared for: Nanolux Technologies.**  
1127 Grant Ave, Novato, CA 94945

**Date of test: 10/30/2014**  
**Test and report by: JEFF AHN**

**1. Purpose of the test**

To compare relative single point PAR values between four different light sources.

**2. Test samples**

The client submitted a luminaire with adjustable ballast output (600W – 1200W) and four High Pressure Sodium lamps.

Sample #	Catalog number
1	Nanolux 1000W DE HPS A425
2	Philips 46-27 GreenPower Plus 1000W
3	GavitaPRO PLUS 1000W HPS K12x30S PART 21.10.1.12
4	Ushio AHS-DE1000W-PRO-PLUS

**Table 1** Test samples

**3. Equipment used**

- 1) Type-C Gonio machine (Model: LLI-TYPEC-01)
- 2) Gigahertz-Optik PAR sensor head (Model: PS-3701-2)
- 3) Gigahertz-Optik Optometer (Model: P-9710)
- 4) Chroma Programmable AC Source (Model: 61604)
- 5) Xitron Power Analysis System (Model: 2503AH)

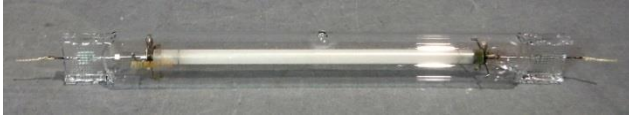
**4. Test procedure**

- 1) Luminaire (FIG.6) is mounted on Gonio in a dark room (FIG.8).
- 2) The distance from the luminaire opening to the PAR sensor is **95 inches**.
- 3) The ballast input voltage is set to 220VAC, 60Hz
- 4) The ballast output is set to **1200W** per client's request for all tests. (FIG.7)
- 5) Each lamp is installed in the luminaire (client submitted) and stabilized for 30 minutes.
- 6) PAR values is recorded by using Gigahertz-Optik PAR sensor head (Model: PS-3701-2) and Gigahertz-Optik Optometer (Model: P-9710)
- 7) Electrical data (Input Voltage, Input Current, Power factor) is recorded for each test.

**5. Test condition**

- 1) The ambient temperature is maintained at 77 °F during the test.
- 2) Each module is tested with identical setup and location of sample and sensor head.
- 3) PAR sensor is positioned directly below the luminaire at the center of the luminaire opening.

**6. Pictures of samples**



**FIG.1 Sample #1**



**FIG.2 Sample #2**

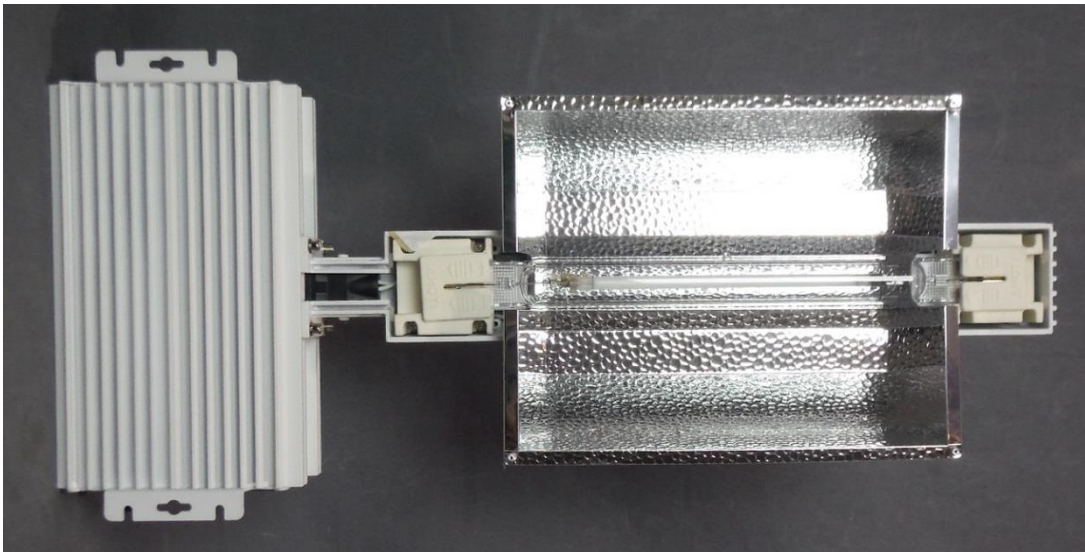


**FIG.3 Sample #3**



**FIG.4 Sample #4**

**7. Luminaire**



**FIG. 6 Luminaire**

## 8. Ballast & Power output setting (1200W)



FIG.7 Ballast

**9. Test setup**

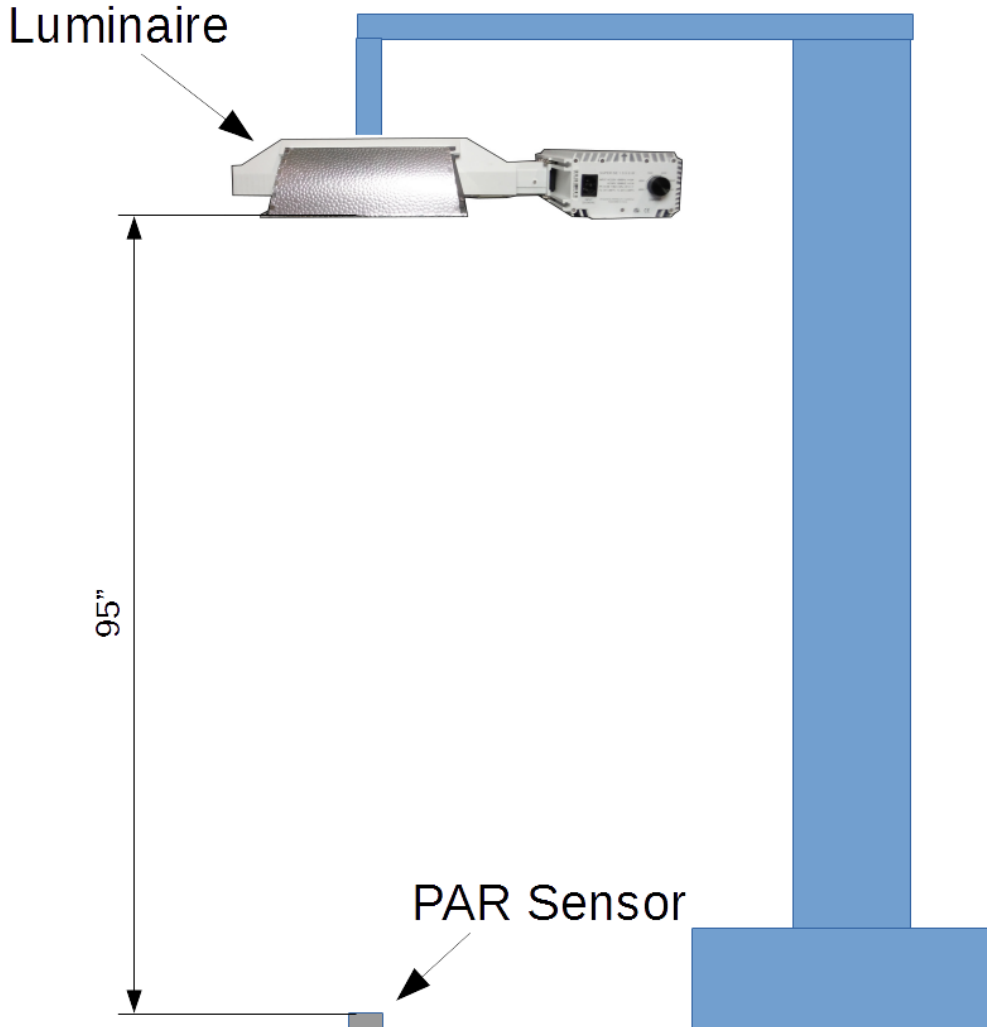


FIG.8 Test setup

8165 E. Kaiser Blvd., Anaheim, CA 92808  
Tel. 714.282.2270 <http://www.lightlaboratory.com>

---

## 10. Test results

Sample	Measured Data	PAR ( $\mu\text{Mole}/\text{m}^2/\text{sec}$ )
#1 Nanolux 1000W DE HPS A425		63.8
#2 Philips 46-27 GreenPower Plus 1000W		63.7
#3 GavitaPRO PLUS 1000W HPS K12x30S PART 21.10.1.12		63.3
#4 Ushio AHS-DE1000W-PRO-PLUS		63.3

**Table 2** Test results