

IES LM-79-08

MEASUREMENT AND TEST REPORT For

P.Q.L., Inc.

Test Model: 83663

Report Type:	Electrical and Photometric tests including: Input Current, Power, Power Factor, Luminous Flux, Luminous Efficacy, CRI, CCT, Chromaticity Coordinate, Spectral Power Distribution
Test Engineer:	Daniel Duan <i>Daniel Duan</i>
Report Number:	R2KS160114051-10A2
Test Date:	2016-02-19
Report Date:	2016-02-26
Reviewed By:	Jeanne Han/Safety Manager <i>Jeanne Han</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008
Test Facility:	Test facility was located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.
Accreditation:	The NVLAP Lab Code is 200707-0.

STATEMENT: This test may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Shenzhen). The test data was only valid for the test sample(s). This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Federal Government. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

1. Product Description

General Information:

One sample was received on 2016-01-14 and used for testing. A recessed troffer was used during test as auxiliary equipment detailed as following.

Model Tested: 83663
 Manufacturer: P.Q.L., Inc.
 Brand Name:
 Product Designation: Linear Retrofit Kits for 1x4 Luminaires
 Dimmable: Non-Dimmable
 Burning Time Before Test: 0 hour(For New Products)
 Auxiliary E quipment: Lensed 1X4

Rated Values:

Rated Voltage/Frequency: 100-240V, 277V AC 60Hz
 Rated Power: 20W
 Nominal Light Output: 2500 lm (For Linear Retrofit Kit)
 Nominal CCT: 5000K

2. Standards Used

IESNA LM -79-08: Approved Method: Electrical & Photometric Measurement of Solid -state Lighting Products
 ANSI C82.77 -2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Integrating Sphere	SENSING	SPR -600	S09008	25~50	2015-03-25	2016-03-24
Spectral photometer	SENSING	SPR3000	90902027	350nm~800nm	2015-03-25	2016-03-24
Power Meter	YOKOGAWA	WT-210	91j926132	15/30/60/150/300/600 V	2015-03-05	2016-03-04
AC Power Supply	ALL Power	APW -105N	970663	220V±10% 50HZ	2015-03-05	2016-03-04
Standard Light Source	EVERFINE	D204	01331191	24V/100W	2015-08-27	2016-08-26
Thermal Meter	SENSING	N/A	N/A	25、50	2015-03-05	2016-03-04
DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	0~32V	2015-03-05	2016-03-04

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Shenzhen) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ during measurement. And relative humidity is less than 65%.

Integrating Sphere System

Sample was tested in a recessed troffer.

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is $U=2.1\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=32\text{K}$ ($K=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.1$ ($K=2$), at the 95% confidence level.

The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.15\%$ of rdg, Power $U=0.20\%$ ($K=2$), at the 95% confidence level.

5. Test Result

[Integrating Sphere System]

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Downward**

Electrical Measurement

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.02	60	0.168	19.83	0.984

Photometric Measurement

Luminous Flux (lm)	Radiant Flux (W)	Efficacy (lm/W)	CCT (K)	Duv
2106.139	7.017	106.21	5048	0.0028

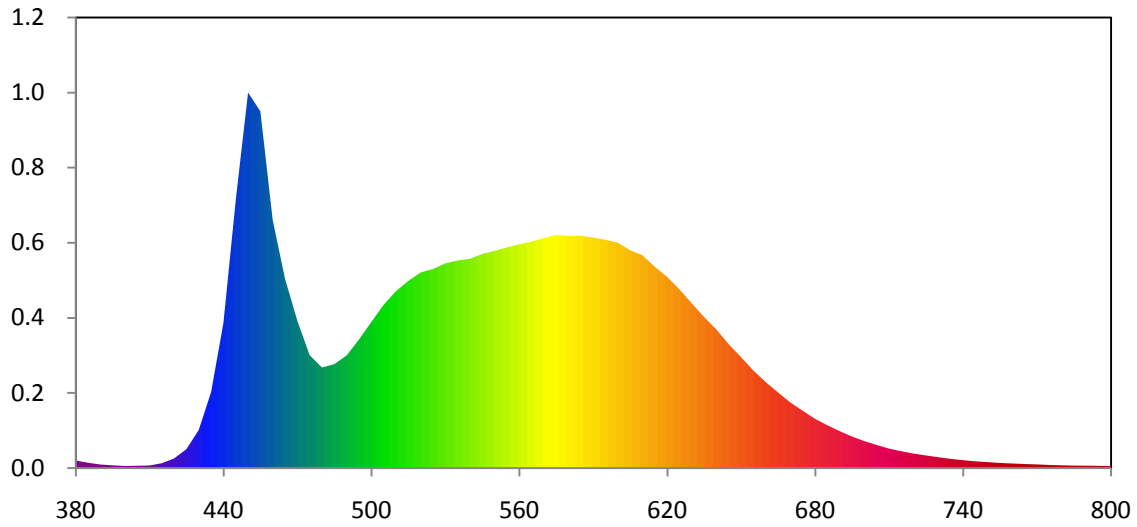
Chromaticity Coordinate

x	y	u	v	u'	v'
0.3443	0.3566	0.2090	0.3246	0.2090	0.4870

Color Rendering Index

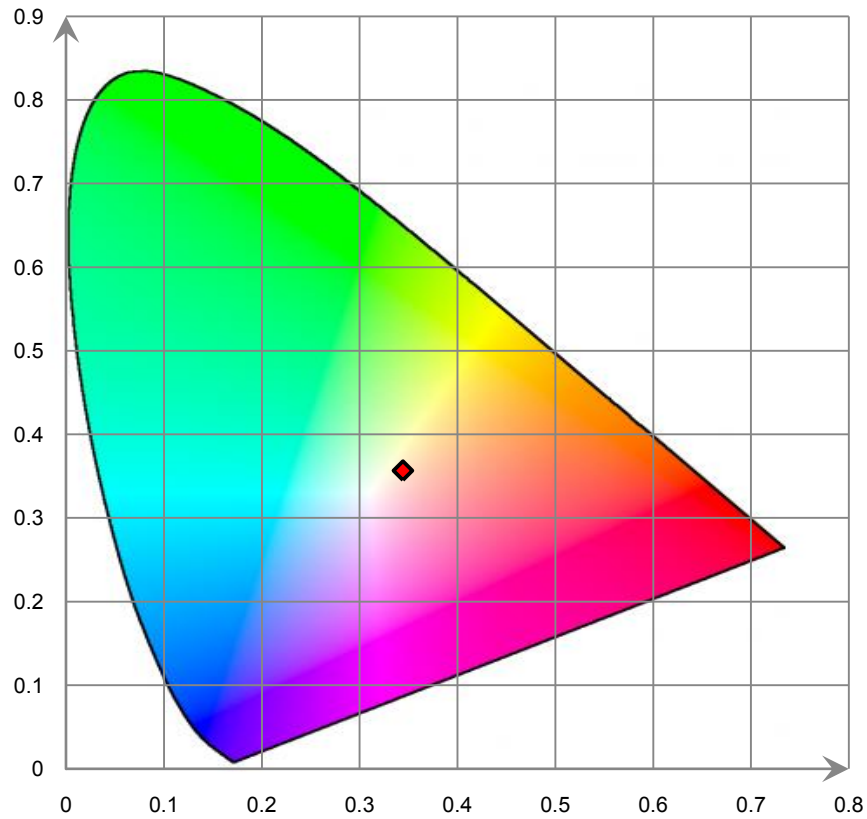
Ra			
84.0			
R1	R2	R3	R4
82	89	94	83
R5	R6	R7	R8
83	85	87	68
R9	R10	R11	R12
12	75	83	62
R13	R14	R15	
85	97	77	

Relative Spectral Power Distribution

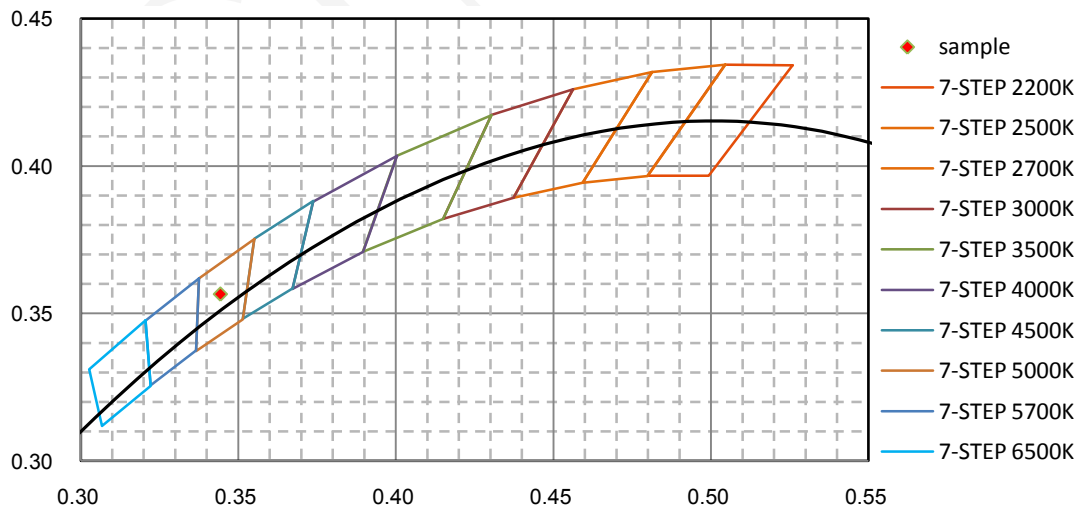


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	6.066E-03	465	1.505E-01	550	1.728E-01	635	1.202E-01	720	1.155E-02
385	4.270E-03	470	1.171E-01	555	1.755E-01	640	1.103E-01	725	1.007E-02
390	2.876E-03	475	8.975E-02	560	1.780E-01	645	9.852E-02	730	8.639E-03
395	2.197E-03	480	8.003E-02	565	1.802E-01	650	8.829E-02	735	7.387E-03
400	1.690E-03	485	8.270E-02	570	1.828E-01	655	7.765E-02	740	6.314E-03
405	1.875E-03	490	8.959E-02	575	1.854E-01	660	6.840E-02	745	5.391E-03
410	2.070E-03	495	1.022E-01	580	1.846E-01	665	6.020E-02	750	4.791E-03
415	3.888E-03	500	1.161E-01	585	1.848E-01	670	5.218E-02	755	4.105E-03
420	7.705E-03	505	1.298E-01	590	1.833E-01	675	4.566E-02	760	3.670E-03
425	1.508E-02	510	1.406E-01	595	1.816E-01	680	3.924E-02	765	3.253E-03
430	3.036E-02	515	1.488E-01	600	1.792E-01	685	3.407E-02	770	2.952E-03
435	6.050E-02	520	1.555E-01	605	1.732E-01	690	2.940E-02	775	2.509E-03
440	1.154E-01	525	1.583E-01	610	1.693E-01	695	2.512E-02	780	2.241E-03
445	2.131E-01	530	1.628E-01	615	1.601E-01	700	2.148E-02		
450	2.986E-01	535	1.651E-01	620	1.521E-01	705	1.840E-02		
455	2.837E-01	540	1.664E-01	625	1.422E-01	710	1.552E-02		
460	1.973E-01	545	1.702E-01	630	1.310E-01	715	1.342E-02		

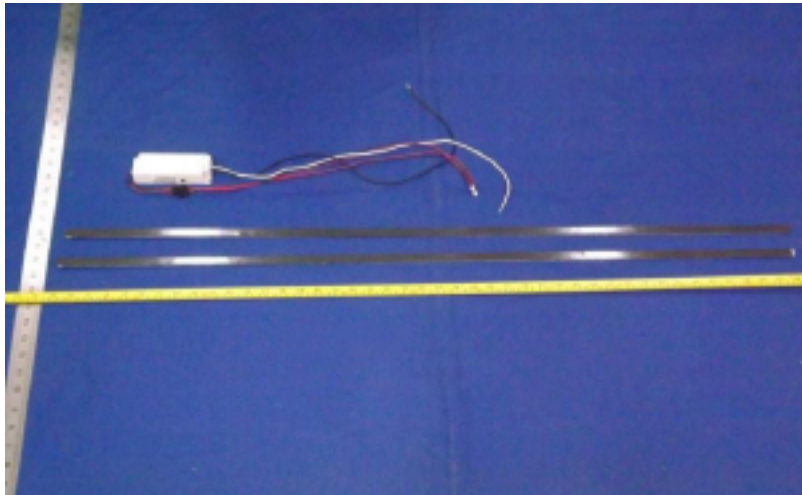
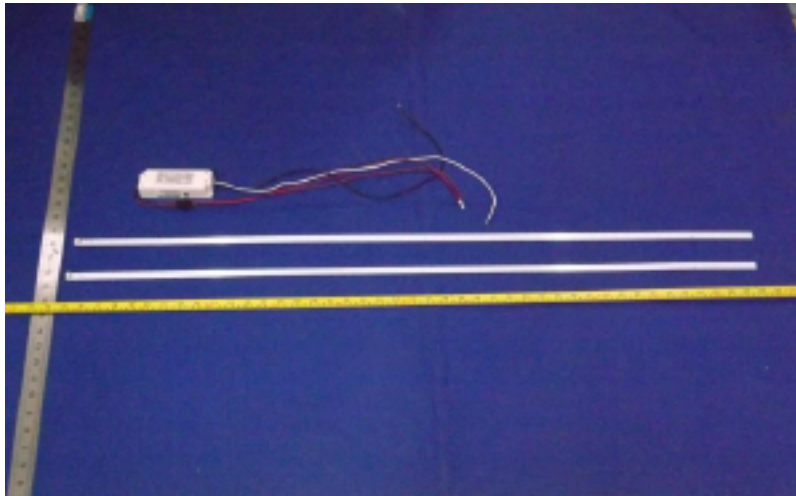
CIE 1931 x y Chromaticity Diagram



7-Step & 4-Step Chromaticity Quadrangles



6. Product Photo



Auxiliary Equipment (Recessed Troffer)



*****END OF REPORT*****