



Shenzhen Belling Efficiency Testing Lab



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Test report of

IES LM-79-08

Approved Method: Electrical and Photometric

Measurements of Solid-State Lighting Products

Applicant:

P.Q.L., Inc.

Address:

2285 Ward Avenue / Simi Valley, CA 93065

For Product:

LED Portable Luminaire

Model No.:

91104

Test laboratory: Shenzhen Belling Efficiency Testing Lab., 1/F., Building 1, 1F, No.1 building, Meibaohe industrial park, Dalang street, Shenzhen, Guangdong Prov.518101

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Complied by: Sam Chen

Review by: Jason Zhou

Project Engineer

Technical Manager

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Shenzhen Belling Efficiency Testing Lab. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.



1 General

1.1 Product Information

Manufacturer	P.Q.L., Inc.
Manufacturer Address	2285 Ward Avenue / Simi Valley, CA 93065
Brand Name	Superior Life®
Luminaire Type	LED Portable Luminaire
Model Number	91104
Rated Inputs	AC120V 60Hz
Rated Power	8W
Nominal CCT	3000K
LED Package, Array or Module	N/A
Date of Receipt Samples	2016-12-22

1.2 Standards or methods

- ANSI/NEMA/ANSI C78.377-2015: Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits-Related Power Quality Requirements for Lighting Equipment
- CIE Publication No.13.3-1995: Method of Measuring and Specifying Color Rendering of Light Sources
- CIE Publication No.15:2004 Colorimetry
- IES LM-79-08 Approved Method: Electric & Photometric Measurement of Solid-state Lighting Products



1.3 Equipment list

Device	Manufacture	Model No.	Serial No.	Calibration due date
Goniophotometric System	SENSING	GMS-3000	N.A	2017-09-21
AC Power Source	ALL POWER	APW-110N	992257	2017-08-27
Total Luminous Flux Standard Lamp	SENSING	110V/100W	S13100234	2017-09-15
Digital Power Meter	YOKOGAWA	WT310	C2QM02030V	2017-08-29
Integral Sphere	SENSING	SPR-600M	N.A	2017-08-27
Integral Sphere (2M)	SENSING	SD-20	N.A	2017-08-27
Digital Power Meter	YOKOGAWA	WT210	91L929742	2017-08-29
Optical Color and Electrical Measurement System	SENSING	SPR-3000	N.A	2017-08-27
Temperature/humidity/clock	VICTOR	VC230	57636	2017-09-13
Digital Anemometer	TECMAN	TD8901	026141	2017-09-13

Statement of Traceability: Shenzhen Belling Efficiency Testing Lab attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).



2 Test conducted and method

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within ± 0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Integrating Sphere System

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.

2.5 Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The method according to IESNA LM-79-08 following chapter.



3 Test Result Summary

3.1 Electrical data

Test System	Result (Sphere System)		Result (Goniophotometer)	
Input Voltage/Frequency (V/Hz)	120/60Hz		-	
Input Current (A)	0.065		-	
Total Power (W)	7.53		-	
Off-state Power	0		-	
Power Factor	0.959@120V	-	-	-
I-THD	12.9%@120V	-	-	-

3.2 Photometric data

Criteria Item	Result (Sphere System)	Result (Goniophotometer)
Total Lumens (lm)	781.042	-
Luminaire Efficacy(lm/W)	103.724	-
Correlated Color Temperature (CCT)	3037K	-
Color Rendering Index (CRI)	86.3	-
R9	25	-
Chromaticity Coordinate (x,y)	x=0.4275 y=0.3888	-
Chromaticity Coordinate (u',v')	u'=0.2511 v'=0.5138	-
Duv	-0.0049	-
Spacing Criteria (0-180)	-	-
Spacing Criteria (90-270)	-	-

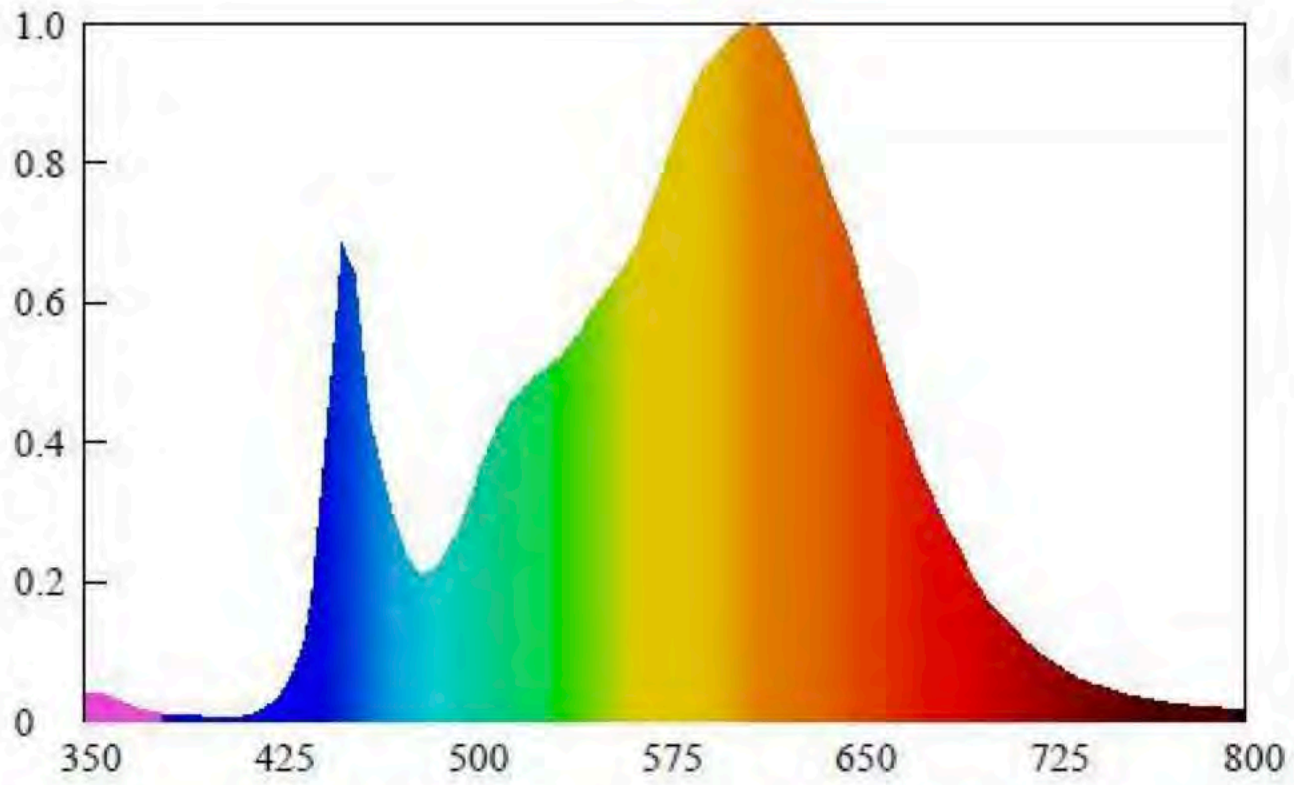


4 Test Data

Color Rendering Details

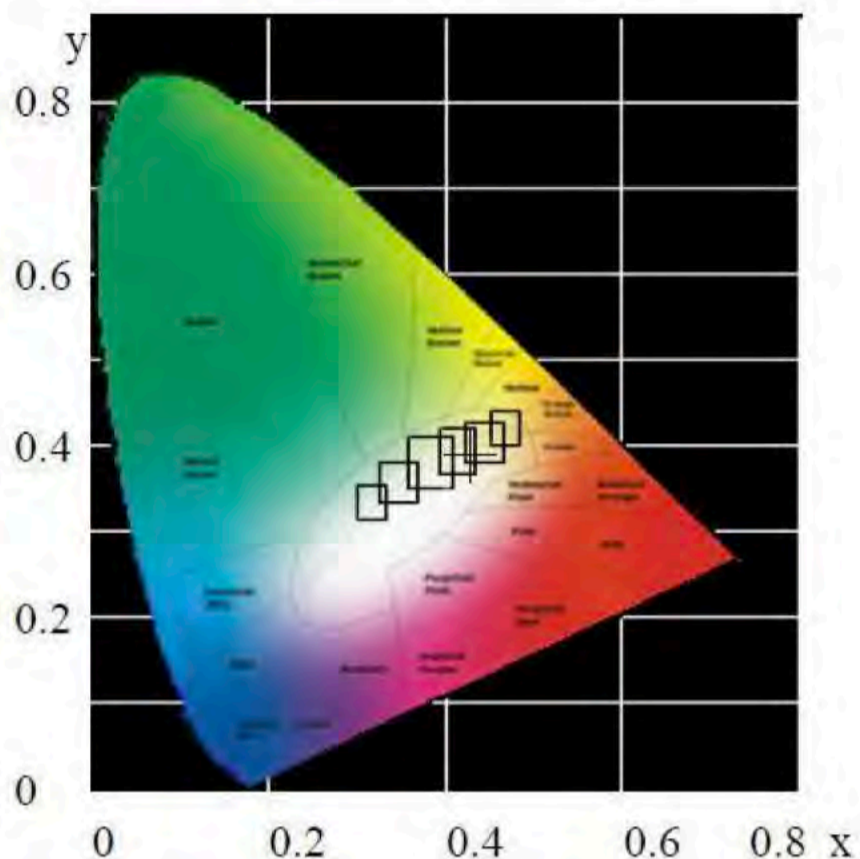
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87	95	95	85	87
R6	R7	R8	R9	R10
93	84	66	25	88
R11	R12	R13	R14	R15
85	77	90	98	81

Spectral Distribution





Chromaticity Diagram



ANSI Chromaticity Quadrangles Diagram

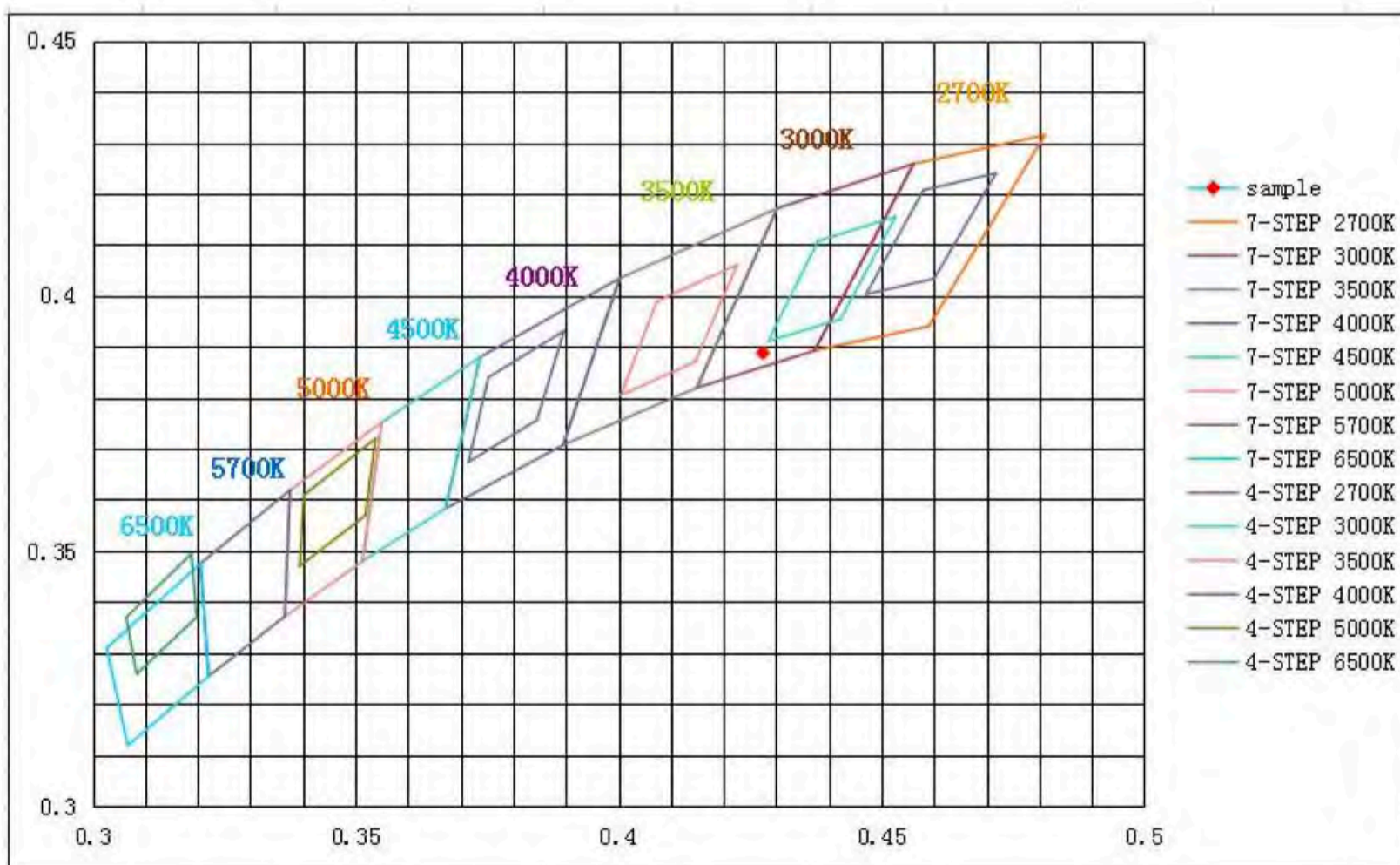
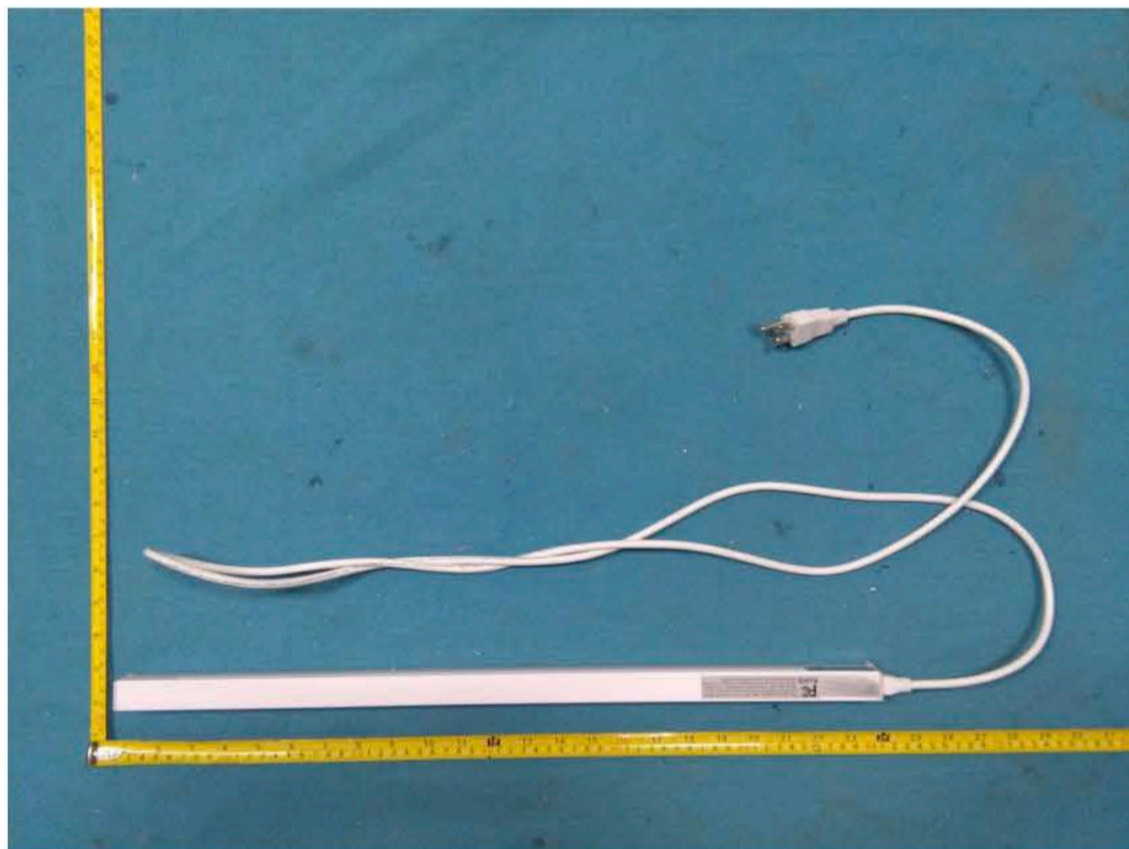
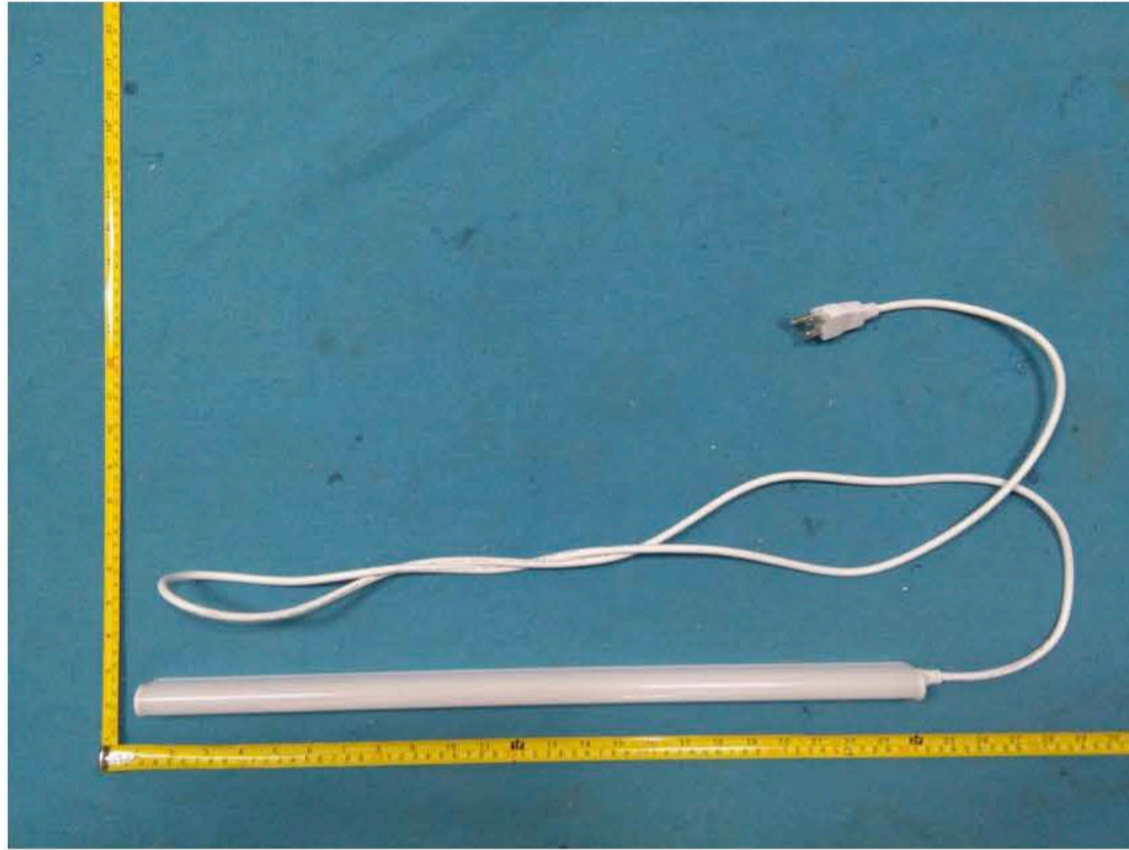




Photo Document



End of test report