



FOR THE SCOPE OF
ACCREDITATION UNDER NVLAP
LAB CODE 200849-0

TEST REPORT

Job No. 140600616SHA

Date: June 22, 2014

REPORT NO. 140600616SHA-007

TEST OF ONE LED LUMINAIRE
MODEL NO. 90814 DIM(4000K)

RENDERED TO

P.Q.L., Inc.
2285 Ward Avenue Simi Valley, CA 93065

TEST: Electrical and Photometric as required to the IESNA LM-79 test standard.

STATEMENT OF LIMITATION: The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, INST, or any agency of the federal government.

LABORATORY NOTE: The laboratory that conducted the testing detailed in this report has been Qualified, Verified, and Recognized for LM-79 Testing for ENERGY STAR for Luminaires by NVLAP program.

AUTHORIZATION: The testing performed was authorized by signed quote number QSH140313060

STANDARDS USED: The following American National Standards or Illuminating Engineering Society of North America Test Guides were used in part or totally to test each specimen:

NEMA ANSLG C78.377: 2008 Specifications of the Chromaticity of Solid State Lighting Products
IESNA LM-79: 2008 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted two samples of model 90814 DIM(4000K). The samples were received by Intertek on June 10, 2014, in undamaged condition, and one sample was tested as received. The sample designations was 0140601-07-007

DATES OF TESTS: June 12, 2014 through June 22, 2014

ISSUED BY: Intertek Testing Services Shanghai

TEST LOCATION: 7 floor, No.51, 1089 Qinzhou Road (North), Shanghai, China 200233

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SUMMARY

Model Number :	90814 DIM(4000K)
Description:	Fixed Luminaire
Use :	Indoor Applications-New,Fully Integrated Luminaires

Test Condition: 120V 60Hz

Criteria	Result
Total Lumen Output	5011.4
Total Power	52.55
Luminaire Efficacy	95.37
Correlated Color Temperature (CCT)	3997
Color Rendering Index (CRI)	81.4
Chromaticity Coordinate (x)	0.3828
Chromaticity Coordinate (y)	0.3849
Chromaticity Coordinate (u')	0.2234
Chromaticity Coordinate (v')	0.5055
Power factor at 120V	0.99
Power factor at 277V	0.98
THD at 120V	5.24
THD at 277V	12.48
Spacing Criteria(C0/180)	1.39
Spacing Criteria (C90/270)	1,26
Duv	0.0009

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EQUIPMENT LIST

Equipment Used	Model Number	Control Number
Fluke Temperature Meter	52	EC2357
Everfine- DC Power Supply	WY12010	EC4753-7
Everfine- AC power source for Integrating Sphere System	VPS1010 PWM	EC4760-12
Everfine - AC power source for Goniophotometer System	VPS1060 PWM	EC4753-8
Two meter integrating sphere unit	Everfine – 2M	EC4760
Everfine - Digital Power Meter	PF2010A	EC4760-10
YOKOGAWA - Digital Power Meter	WT210	EC4553
Everfine – Goniophotometer	Go-R5000	EC4753

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TEST METHOD

Seasoning in Sample Orientation – LED Products

No seasoning was performed in accordance with IESNA LM-79

Light Distribution and Output Measurements

Light Distribution and total light output (luminous flux) were measured using a Go-R5000 Type-C Rotating Mirror Goniophotometer. Temperature 25°C and relative humidity of 60% was measured at a position in the testing laboratory.

The lamp rotates only around the fixed vertical axle in the prescribed burning position. The lamp and mirror permit the measurement of luminous intensity at the direction of any horizontal or vertical angle without tilting the lamp. The lamp was allowed to stabilize before measurements were made.

Chromaticity Measurements

Chromaticity was measured using a 2 meters integrating sphere spectral lamp measurement system. Temperature was measured at a position inside the sphere shielded from direct light. Relative humidity of 65% was measured at a position in the testing laboratory.

Spectral radiant flux measurements were made using spectroradiometer attached to the detector port of the integrating sphere. Each lamp was allowed to stabilize before measurements were made. The calibration of the integrating sphere spectroradiometer system is by the reference/standard lamps which are traceable to National Institute of Metrology P.R. CHINA. Lamp efficacy (lumens per watt) for each lamp model was then computed based on the luminous flux result. Electrical measurements including voltage, power and power factor were measured using YOKOGAWA - Digital Power Meter., model WT210.

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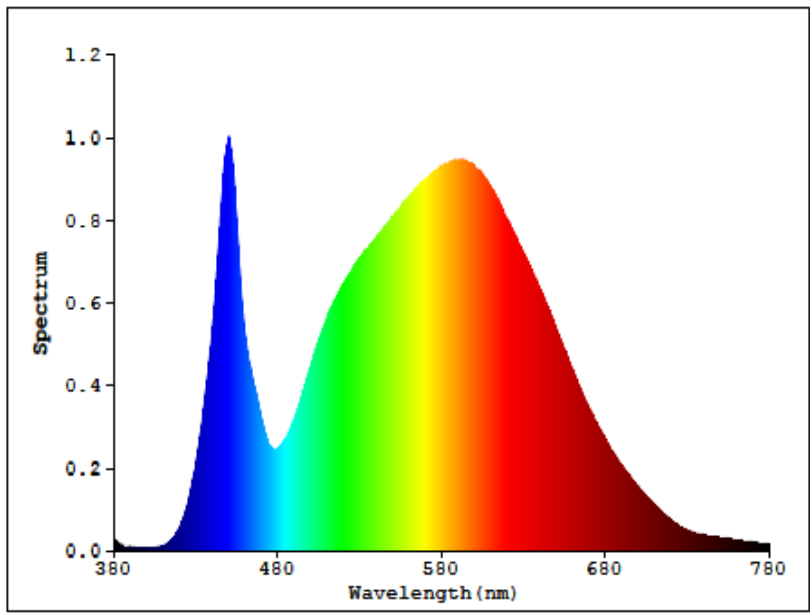


RESULTS OF TESTS

Test Condition: 120V 60Hz

Spectral Distribution over Visible Wavelengths

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
380	0.0235	480	0.2458	580	0.9279	680	0.2687	780	0.0147
385	0.0116	485	0.2724	585	0.939	685	0.2356		
390	0.0079	490	0.3174	590	0.945	690	0.2063		
395	0.0055	495	0.3782	595	0.9436	695	0.1803		
400	0.0052	500	0.445	600	0.9284	700	0.1549		
405	0.0063	505	0.5082	605	0.9096	705	0.1314		
410	0.0113	510	0.5634	610	0.8809	710	0.1107		
415	0.0261	515	0.6065	615	0.8445	715	0.0908		
420	0.055	520	0.6447	620	0.8021	720	0.0735		
425	0.1137	525	0.6754	625	0.7641	725	0.0593		
430	0.2105	530	0.7093	630	0.7216	730	0.0488		
435	0.3477	535	0.7318	635	0.6798	735	0.0421		
440	0.5336	540	0.7563	640	0.6326	740	0.0379		
445	0.8024	545	0.7835	645	0.5877	745	0.0348		
450	0.9993	550	0.8085	650	0.5374	750	0.0318		
455	0.7834	555	0.8322	655	0.487	755	0.0292		
460	0.5191	560	0.8566	660	0.4372	760	0.0261		
465	0.406	565	0.8767	665	0.3898	765	0.023		
470	0.3178	570	0.9001	670	0.3445	770	0.0199		
475	0.2544	575	0.913	675	0.3056	775	0.0172		



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RESULTS OF TESTS (cont'd)

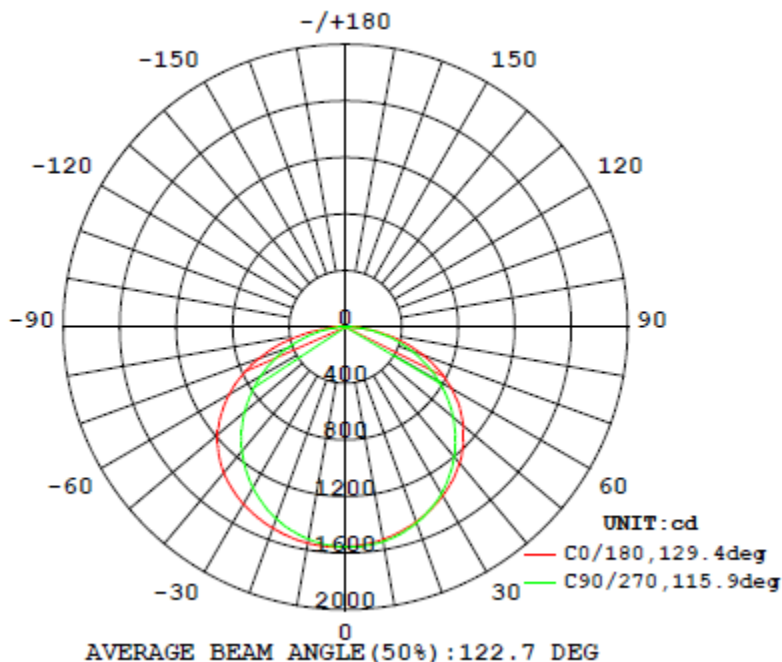
Photometric Measurements at 25°C – Integrating Sphere Method

Intertek Sample No.	Base Orientation	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate (x)	CIE 31' Chromaticity Coordinate (y)	CIE 76' Chromaticity Coordinate (u')	CIE 76' Chromaticity Coordinate (v')
90814 DIM(4000K)							
0140601-07-007	N/A	3997	81.4	0.3828	0.3849	0.2234	0.5055

Photometric and Electrical Measurements at 25°C – Distribution Method

Intertek Sample No.	Base Orientation	Input Voltage (Vac)	Input Current (mA)	Input Power (Watts)	Input Power Factor	Absolute Luminous Flux (Lumens)	Lumen Efficacy (Lumens Per Watt)
90814 DIM(4000K)							
0140601-07-007	N/A	120	441.4	52.55	0.99	5011.4	95.37

Intensity (Candlepower) Summary at 25°C - Candelas



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RESULTS OF TESTS (cont'd)

Intensity (Candlepower) Summary at 25°C - Candelas

V \ H(°)	0	22.5	45	67.5	90
0	1556.3	1555.4	1556.4	1557.7	1555.2
5	1546.1	1542.9	1543.2	1545.2	1544.7
10	1523.5	1518.7	1519.7	1523.7	1526.4
15	1489.3	1483.5	1486.6	1493.6	1499.7
20	1442.7	1436.5	1443.3	1455.1	1465.9
25	1383.8	1378.6	1391.0	1409.5	1424.9
30	1314.7	1310.9	1330.0	1356.6	1377.4
35	1234.7	1232.7	1259.8	1296.1	1321.9
40	1142.9	1144.5	1180.2	1225.6	1256.7
45	1043.9	1048.5	1090.5	1143.3	1179.8
50	936.2	943.2	989.4	1049.4	1089.1
55	818.7	828.3	877.6	943.2	984.4
60	696.5	707.5	756.7	824.6	865.0
65	570.4	581.2	628.4	693.3	732.7
70	442.3	452.4	494.5	553.1	587.7
75	313.8	322.6	357.1	405.6	433.7
80	189.4	195.6	220.4	255.9	277.7
85	78.9	76.3	90.8	111.0	123.5
90	0.2	0.2	0.2	0.2	0.8

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RESULTS OF TESTS (cont'd)

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
90814 DIM(4000K)		
0-30	1234	24.6
0-40	2054	40.9
0-60	3779	75.4
0-90	5009	99.9
60-90	1230	24.5
0-180	5011	100

Beam Angle

Total Beam Angle(°)

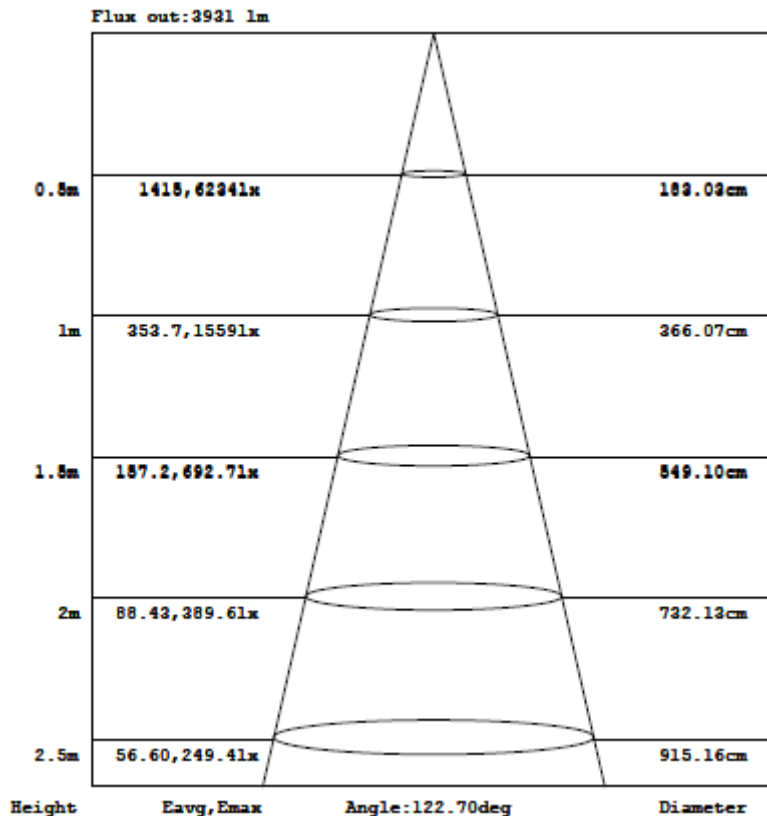
122.7

Illumination Plots

Model No.: 90814 DIM(4000K)

Mount Height: 2.5m

Illuminance - Cone of Light

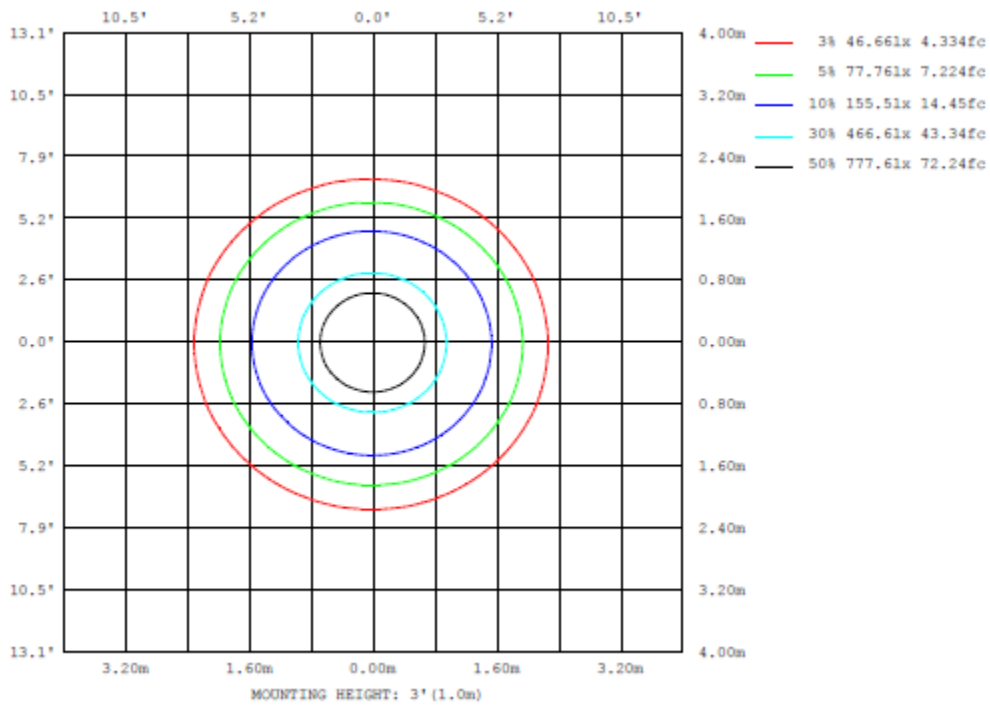


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RESULTS OF TESTS (cont'd)

Model No.: 90814 DIM(4000K)
Mount Height: 1 m
Isoillumination Plot

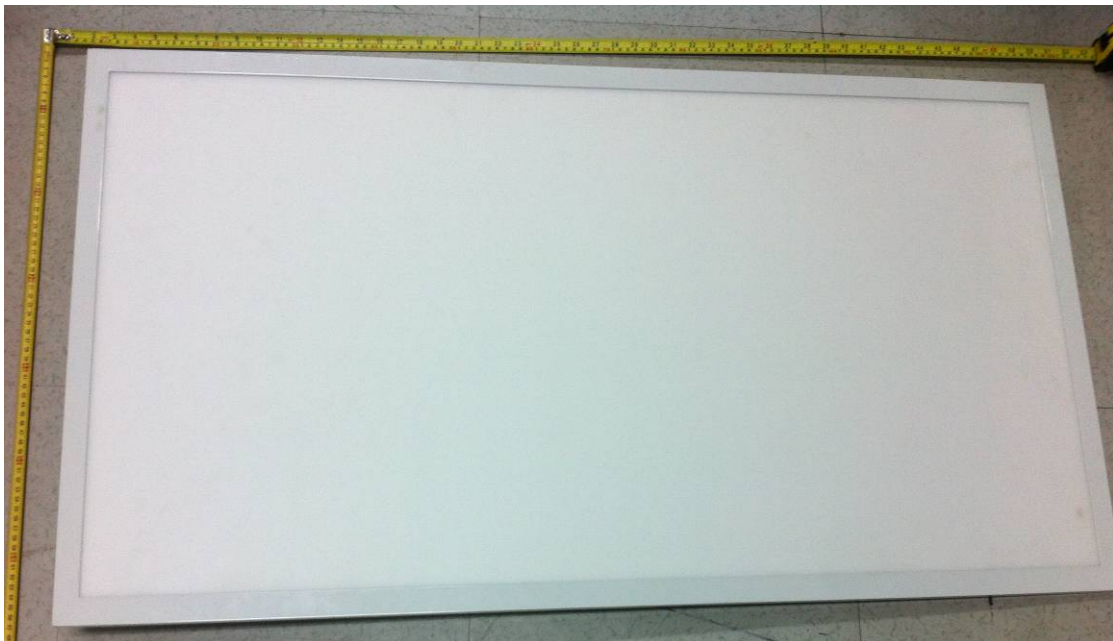
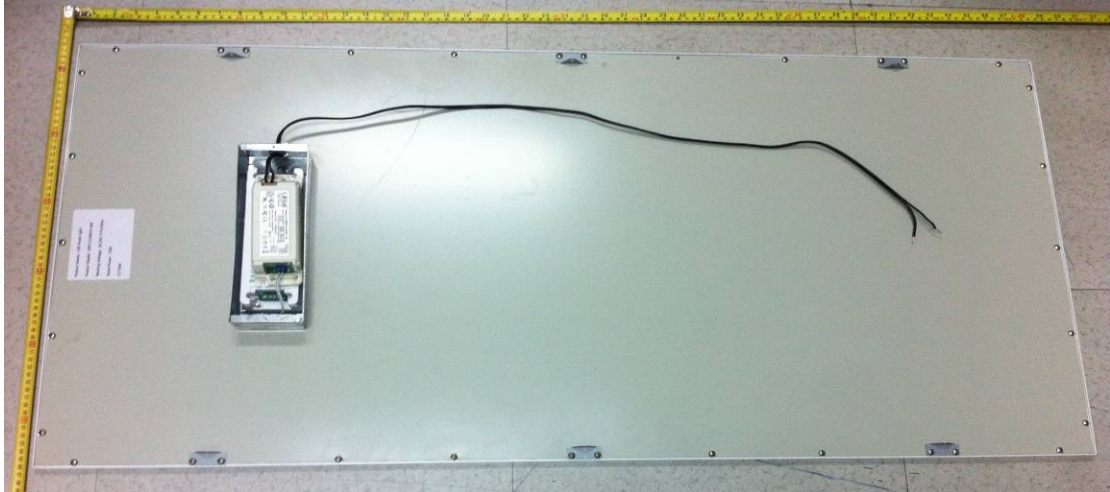


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RESULTS OF TESTS (cont'd)

Product Picture (not to scale)



90814 DIM(4000K)

In Charge Of Tests:

Jordan Rao
Project Engineer

Report Reviewed By:

Jimmy Wang
Reviewer

Attachment: None

***** End of Report *****

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