



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

TEST REPORT

Job No. 140600616SHA

Date: June 22, 2014

REPORT NO. 140600616-002

TEST OF ONE LED LUMINAIRE
MODEL NO. 90801 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
IESNA LM-79: 2008

Specifications of the Chromaticity of Solid State Lighting Products
Approved Method for the Electrical and Photometric Measurements
of Solid-State Lighting Products

DESCRIPTION OF SAMPLE: The client submitted two samples of model 90801 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 0140601-07-002

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 :	90801 DIM(4000K)
Description:	Fixed Luminaire
Use :	Indoor Applications-New,Fully Integrated Luminaires

Test Condition: 120V 60Hz

Criteria	Result
Total Lumen Output	4088.3
Total Power	43.12
Luminaire Efficacy	94.82
Correlated Color Temperature (CCT)	4007
Color Rendering Index (CRI)	81.4
Chromaticity Coordinate (x)	0.3819
Chromaticity Coordinate (y)	0.3832
Chromaticity Coordinate (u')	0.2235
Chromaticity Coordinate (v')	0.5046
Power factor at 120V	0,99
Power factor at 277V	0,98
THD at 120V	5.26
THD at 277V	11.47
Spacing Criteria(C0/180)	1,37
Spacing Criteria (C90/270)	1,27
Duv	0.0008

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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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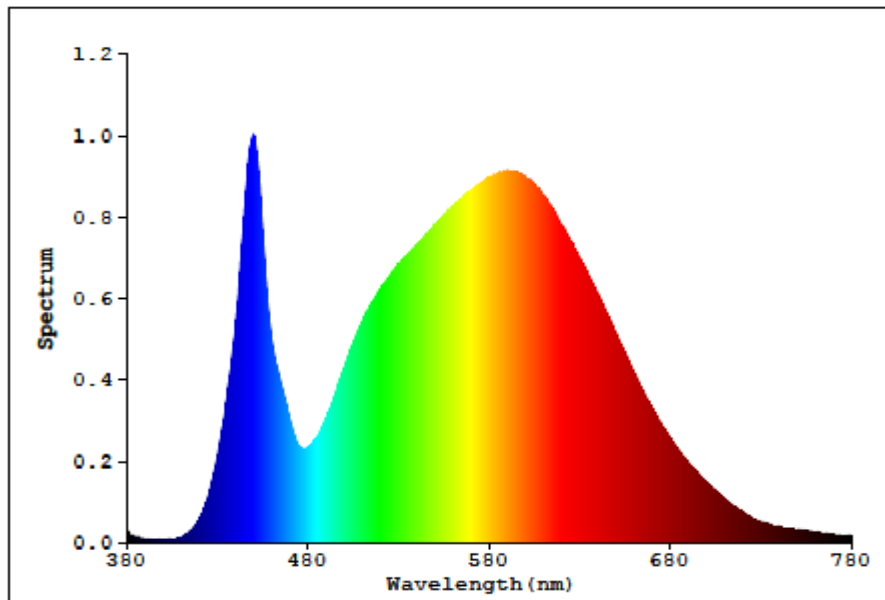


RESULTS OF TESTS

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	0.0238	480	0.2321	580	0.8934	680	0.2542	780	0.0137
385	0.0123	485	0.2587	585	0.9052	685	0.2233		
390	0.0064	490	0.3045	590	0.9091	690	0.1941		
395	0.0058	495	0.3636	595	0.9078	695	0.1691		
400	0.0053	500	0.4285	600	0.8919	700	0.1466		
405	0.0073	505	0.4904	605	0.8763	705	0.1245		
410	0.0127	510	0.5434	610	0.8509	710	0.1056		
415	0.028	515	0.5831	615	0.8175	715	0.0885		
420	0.0574	520	0.6217	620	0.7778	720	0.0734		
425	0.1152	525	0.6509	625	0.7382	725	0.0604		
430	0.21	530	0.6838	630	0.6956	730	0.0502		
435	0.347	535	0.706	635	0.653	735	0.0435		
440	0.5334	540	0.7285	640	0.6077	740	0.0386		
445	0.8169	545	0.7554	645	0.5599	745	0.0349		
450	1	550	0.7791	650	0.5118	750	0.0314		
455	0.7436	555	0.8024	655	0.4629	755	0.0281		
460	0.4877	560	0.8237	660	0.4146	760	0.0246		
465	0.3844	565	0.8417	665	0.3695	765	0.0218		
470	0.2958	570	0.8656	670	0.3263	770	0.0188		
475	0.2371	575	0.8773	675	0.2891	775	0.0162		



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RESULTS OF TESTS (cont'd)

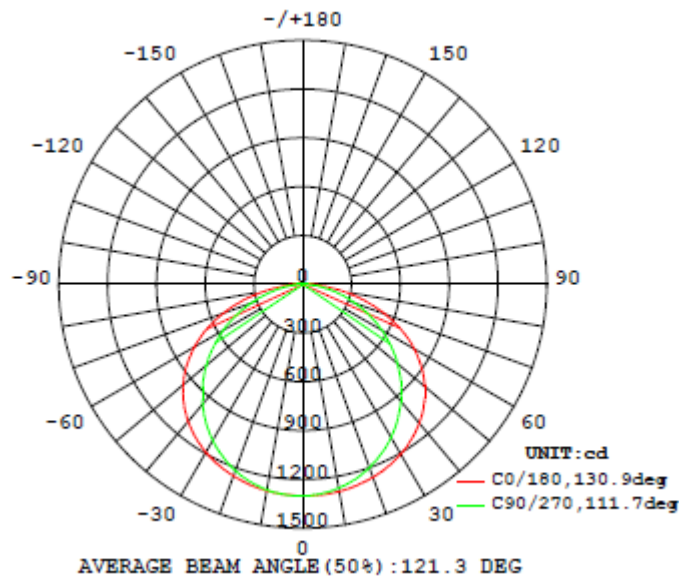
Photometric Measurements at 25°C – Integrating Sphere Method

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')
90801 DIM(4000K)							
0140601-07-002	N/A	4007	81.4	0.3819	0.3832	0.2235	0.5046

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)
90801 DIM(4000K)							
0140601-07-002	N/A	120	363.5	43.12	0.99	4088.3	94.82

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	1300.0	1300.7	1302.1	1302.2	1300.1
5	1297.0	1298.3	1300.5	1301.0	1298.7
10	1282.1	1285.0	1290.2	1293.4	1292.0
15	1255.6	1260.8	1271.1	1279.5	1279.7
20	1217.6	1225.7	1243.3	1258.6	1261.4
25	1168.4	1180.0	1206.0	1230.2	1236.5
30	1109.1	1124.1	1159.4	1194.0	1204.3
35	1039.3	1058.1	1102.9	1148.7	1163.7
40	960.0	982.3	1036.4	1093.7	1113.7
45	872.4	897.4	959.3	1027.4	1052.6
50	776.9	803.6	871.3	948.8	978.8
55	674.5	701.6	773.1	857.1	891.2
60	566.3	593.1	664.4	751.7	788.6
65	455.0	479.8	547.6	633.3	671.1
70	341.5	363.7	424.2	504.1	539.1
75	232.5	250.5	299.5	366.4	397.6
80	133.0	145.6	180.0	228.9	253.3
85	46.5	54.8	72.0	101.5	115.2
90	0.1	0.1	0.2	11.4	16.7

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RESULTS OF TESTS (cont'd)

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
90801 DIM(4000K)		
0-30	1031.3	25.2
0-40	1714.0	41.9
0-60	3131.7	76.6
0-90	4085.2	99.9
60-90	953.5	23.3
0-180	4088.3	100

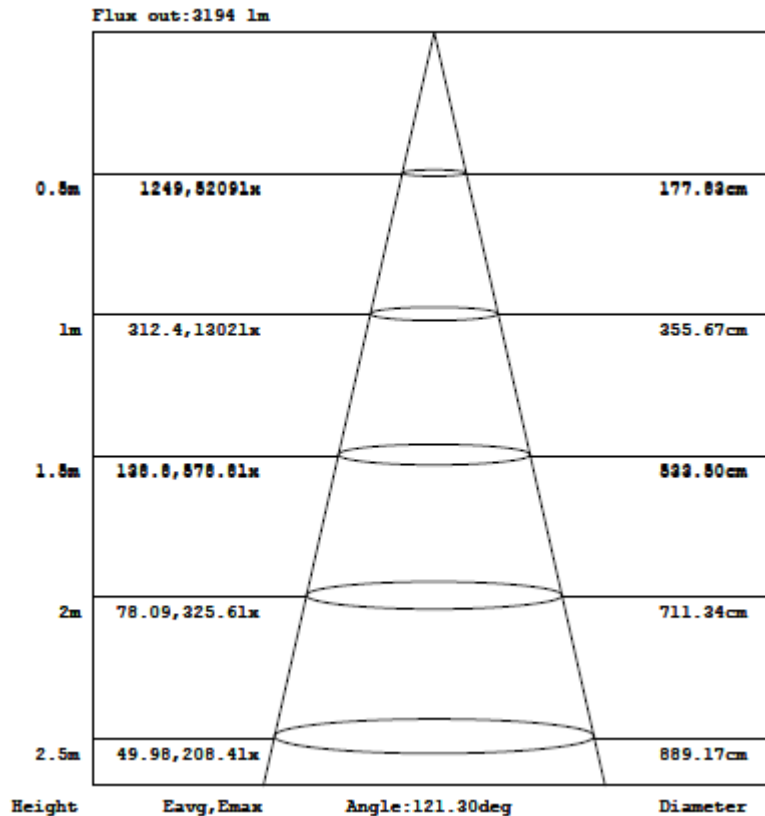
Beam Angle

Total Beam Angle(°)

121.3

Illumination Plots

Model No.: 90801 DIM(4000K)
Mount Height: 2.5m
Illuminance - Cone of Light

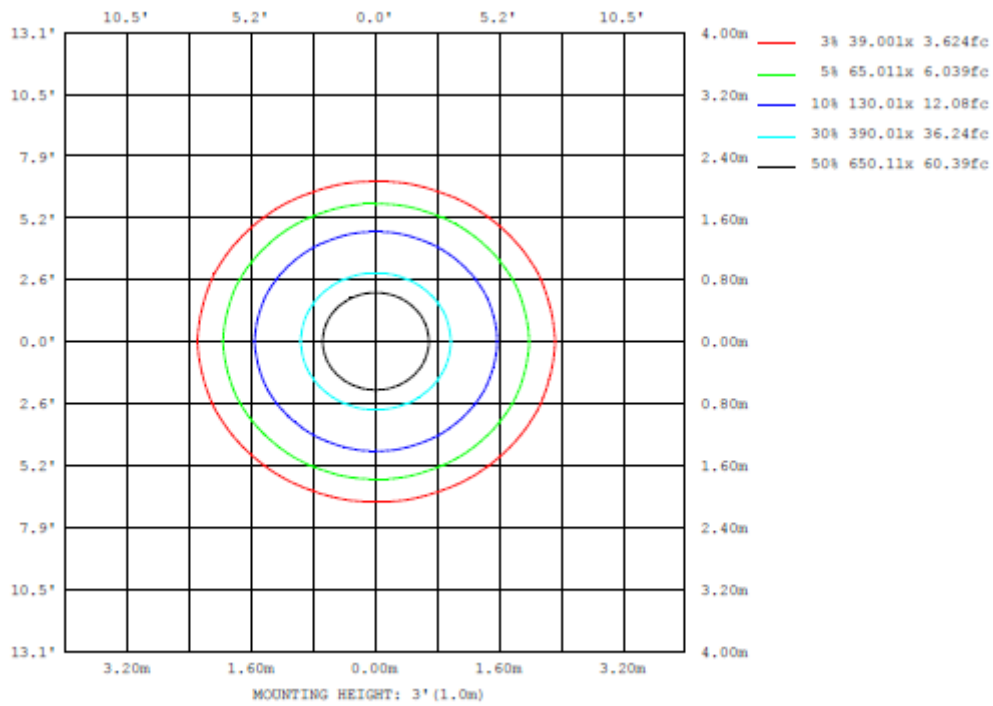


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RESULTS OF TESTS (cont'd)

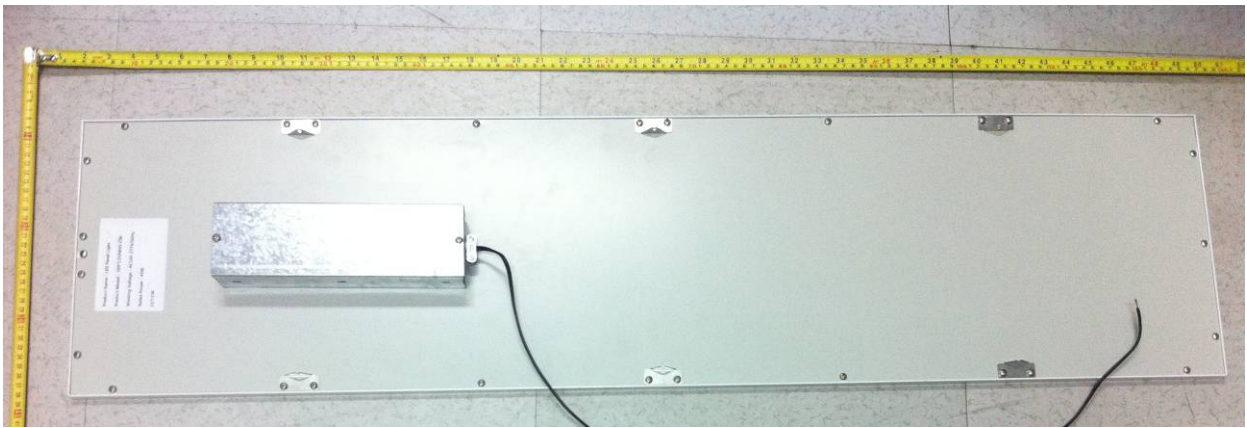
Model No.: 90801 DIM(4000K)
Mount Height: 1 m
Isoillumination Plot



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RESULTS OF TESTS (cont'd)

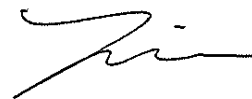
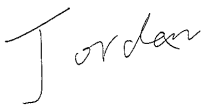
Product Picture (not to scale)



90801 DIM(4000K)

In Charge Of Tests:

Report Reviewed By:



Jordan Rao
Project Engineer

Jimmy Wang
Reviewer

Attachment: None

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