



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

TEST REPORT

Job No. 140600616SHA

Date: June 22, 2014

REPORT NO. 140600616SHA-006

TEST OF ONE LED LUMINAIRE
MODEL NO. 90813 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 90813 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 0140601-07-006

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 :	90813 DIM(4000K)
Description:	Fixed Luminaire
Use :	Indoor Applications-New, Fully Integrated Luminaires

Test Condition: 120V 60Hz

Criteria	Result
Total Lumen Output	4361.6
Total Power	43.26
Luminaire Efficacy	100.82
Correlated Color Temperature (CCT)	3949
Color Rendering Index (CRI)	81.3
Chromaticity Coordinate (x)	0.3850
Chromaticity Coordinate (y)	0.3862
Chromaticity Coordinate (u')	0.2243
Chromaticity Coordinate (v')	0.5063
Power factor at 120V	0.99
Power factor at 277V	0.98
THD at 120V	4.52
THD at 277V	9.74
Spacing Criteria(C0/180)	1.29
Spacing Criteria (C90/270)	1.28
Duv	0.0007

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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.

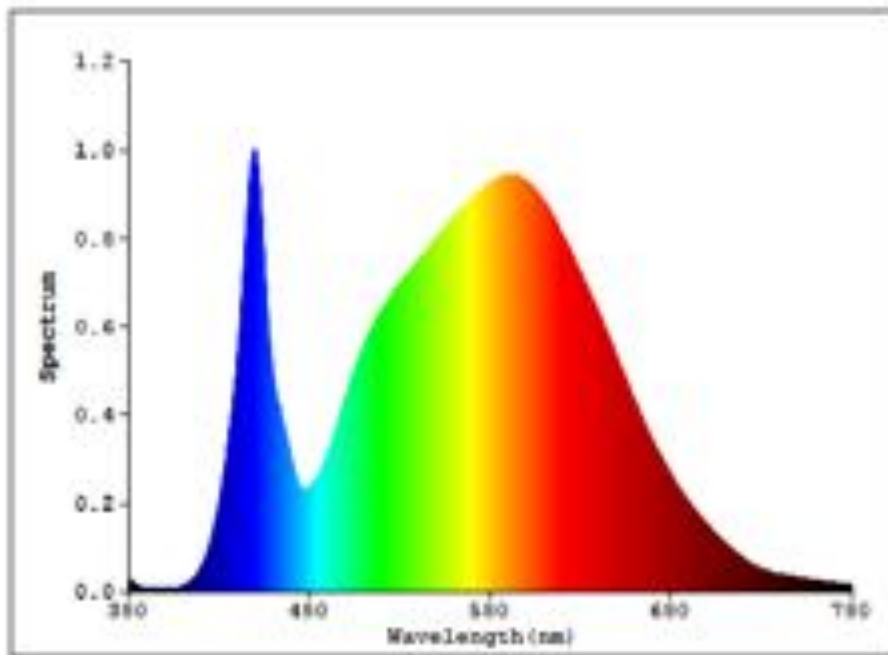
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RESULTS OF TESTS

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	0.0257	480	0.2335	580	0.9230	680	0.2636	780	0.0141
385	0.0115	485	0.2611	585	0.9345	685	0.2306		
390	0.0073	490	0.3095	590	0.9415	690	0.2021		
395	0.0059	495	0.3706	595	0.9415	695	0.1751		
400	0.0057	500	0.4387	600	0.9239	700	0.1515		
405	0.0077	505	0.5004	605	0.9086	705	0.1285		
410	0.0119	510	0.5546	610	0.8801	710	0.1095		
415	0.0258	515	0.5966	615	0.8481	715	0.0905		
420	0.0530	520	0.6352	620	0.8065	720	0.0746		
425	0.1088	525	0.6662	625	0.7651	725	0.0611		
430	0.1999	530	0.6993	630	0.7230	730	0.0506		
435	0.3333	535	0.7229	635	0.6774	735	0.0435		
440	0.5220	540	0.7445	640	0.6294	740	0.0386		
445	0.8133	545	0.7728	645	0.5819	745	0.0353		
450	1.0000	550	0.8233	650	0.5308	750	0.0320		
455	0.7480	555	0.8233	655	0.4810	755	0.0291		
460	0.7432	560	0.8492	660	0.4308	760	0.0254		
465	0.4363	565	0.8677	665	0.3839	765	0.0221		
470	0.2967	570	0.8904	670	0.3385	770	0.0191		
475	0.2376	575	0.9055	675	0.2999	775	0.0166		



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RESULTS OF TESTS (cont'd)

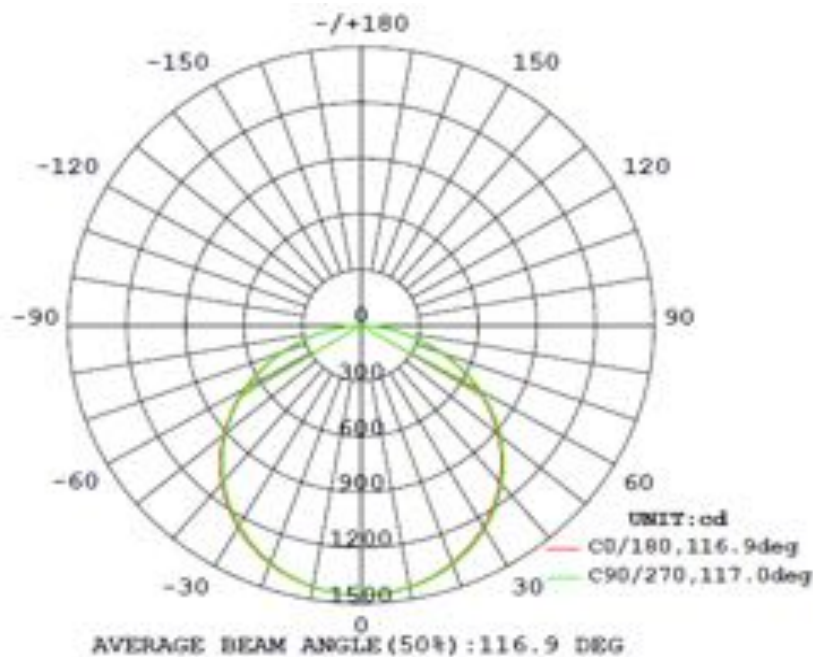
Photometric Measurements at 25°C – Integrating Sphere Method

Intertek Sample No.	Base Orientation	Correlated Color Temperature (K)	CRI	CIE 31' Chromaticity Coordinate	CIE 31' Chromaticity Coordinate	CIE 76' Chromaticity Coordinate	CIE 76' Chromaticity Coordinate
				(x)	(y)	(u')	(v')
90813 DIM(4000K)							
0140601-07-006	N/A	3949	81.3	0.3850	0.3862	0.2243	0.5063

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	Lumen Efficacy
						(Lumens)	(Lumens Per Watt)
90813 DIM(4000K)							
0140601-07-006	N/A	120	364.8	43.26	0.99	4361.1	100.82

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	1455.1	1456.1	1456.0	1454.4	1455.3
5	1447.6	1448.6	1448.8	1447.9	1449.2
10	1429.0	1430.0	1430.6	1430.3	1431.8
15	1399.7	1400.6	1401.5	1401.7	1403.7
20	1359.6	1360.3	1361.6	1362.3	1364.4
25	1308.6	1309.4	1310.9	1312.1	1314.4
30	1247.5	1248.3	1250.0	1251.6	1254.2
35	1176.0	1177.1	1178.9	1180.9	1184.0
40	1095.0	1096.2	1098.2	1100.7	1103.5
45	1004.3	1005.7	1007.8	1010.5	1013.7
50	904.1	905.3	907.8	910.7	913.9
55	794.7	796.2	798.4	801.9	805.0
60	677.4	678.6	680.4	684.8	687.7
65	553.7	554.4	556.2	560.4	562.8
70	425.1	425.6	426.0	430.1	432.0
75	297.1	297.1	295.6	298.7	300.4
80	176.9	175.5	173.3	174.7	175.0
85	72.8	71.9	70.8	70.6	69.2
90	0.1	0.1	0.1	0.1	14.1

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RESULTS OF TESTS (cont'd)

Zonal Lumen Summary and Percentages at 25°C

Zone	Lumens (lm)	% Luminaire (%)
90813 DIM(4000K)		
0-30	1142	26.2
0-40	1885	43.2
0-60	3392	77.8
0-90	4356	99.9
60-90	970	22.1
0-180	4362	100

Beam Angle

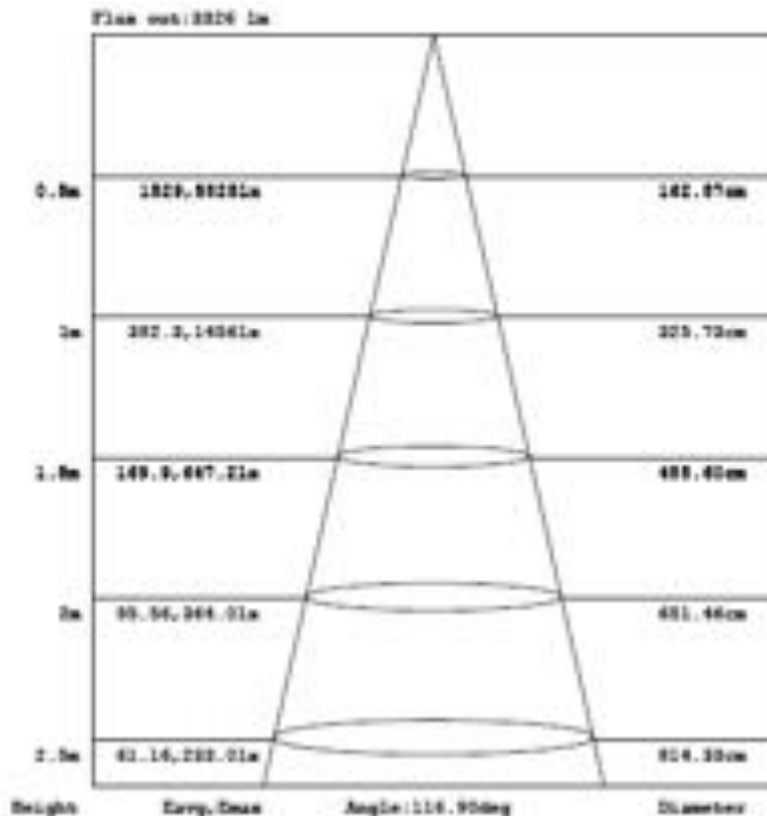
Total Beam Angle(°)

 116.9

Illumination Plots

Model No.: 90813 DIM(4000K)
 Mount Height: 2.5m

Illuminance - Cone of Light

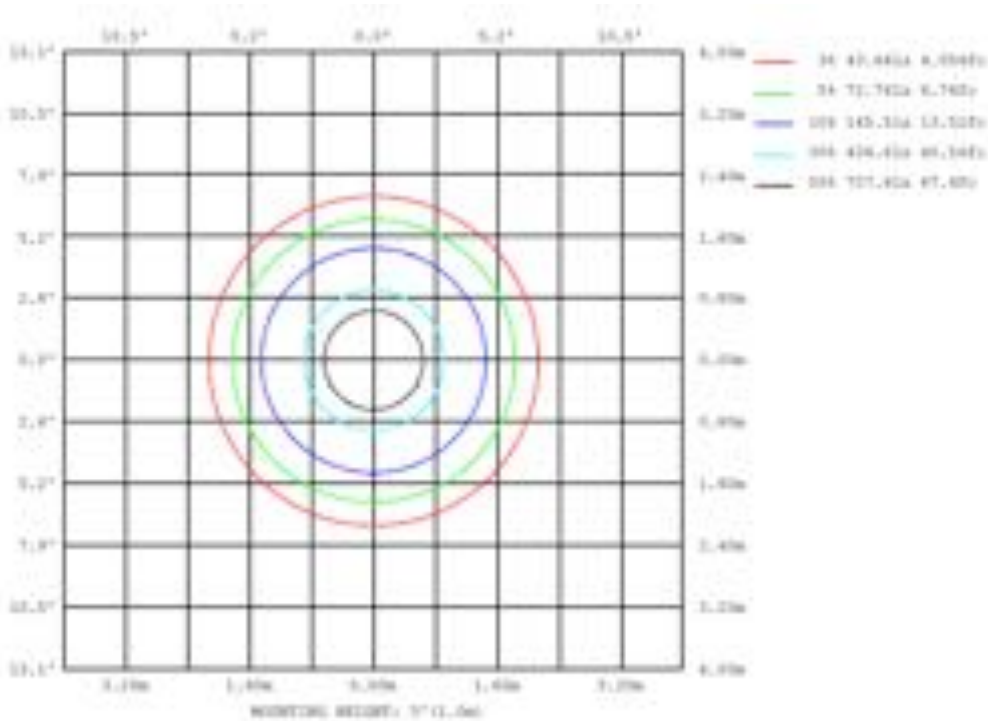


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RESULTS OF TESTS (cont'd)

Model No.: 90813 DIM(4000K)
Mount Height: 1 m
Isoillumination Plot



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RESULTS OF TESTS (cont'd)

Product Picture (not to scale)



90813 DIM(4000K)

In Charge Of Tests:

Report Reviewed By:

Jordan Rao
Project Engineer

Jimmy Wang
Reviewer

Attachment: None

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