

**Verification Services**

Project No.: 4787817257-6  
 Report No.: 4787817257-6a  
 Report Issued Date: 2017-01-04



# Test Report

<b>Customer Company &amp; Address:</b>	
P.Q.L., Inc. 2285 Ward Avenue Simi Valley, CA 93065	
<b>Phone Number:</b>	1-800-323-8107

<b>Relevant Standards:</b>	IES LM-79-2008
<b>Product Description:</b>	Luminaire Description: High Bay Luminaires for Commercial and Industrial Buildings Amount of Light Source: 144 pcs (NF2L757DRT-V1) Manufacture of Light Source: NICHIA Driver: LY96W-39-C2450-RD
<b>Brand Name:</b>	Superior Life®
<b>Tested Model Number:</b>	90414-ACY
<b>Product Family:</b>	N/A
<b>Allowable Variations:</b>	N/A
<b>Nominal CCT</b>	4000K
<b>Electrical Specification:</b>	100-277V AC, 50/60 Hz, 100 W

<b>Test Laboratory &amp; Address:</b>			
UL Verification Services (Guangzhou) Co., Ltd. ADD: Building A1, 1F & 2F, Nansha Science and Technology Innovation Center, No. 25, South Huanshi Avenue , Nansha District, Guangzhou 511458, China			
<b>Telephone:</b>	+86 20 28667188	<b>Fax:</b>	+86 20 83486605

<b>Sample Reception Date:</b>	2017-01-02	<b>Test Date:</b>	2017-01-04
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<b>Tested By</b>	<b>Approved By</b>
 /Dendi Lin	 /Alvin Xie
<b>Signatory &amp; Test Personnel Name</b>	<b>Signatory &amp; Approval Name</b>

**The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.**



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## Statement of Results

Test Flow	Test Item	Sample ID (Lab)	Pass/Fail/NA
1	Integrating Sphere Test	730238-S001	Evaluate by customer
2	Goniophotometer Test	730238-S001	Evaluate by customer
3	THD and PF Test	730238-S001	Evaluate by customer

## Deviation from Test Method (if any)

N/A

## Remark (if any)

1. This report shall not be used by the client to claim product endorsement by NVLAP, NIST or any agency of the US government.



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## Test Flow 1 : Integrating Sphere Test

### Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-PE003	Integrating Sphere	Before Use	Before Use
GVS-LE-PM009	Digital Power Meter	2016-05-17	2017-05-16
GVS-LE-FS007	Measurement Standard Lamp	2016-07-29	2017-07-28

### Test Method

The sample was tested according to the IES LM-79-2008. Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . The reference standard lamp is 100W omni-directional Incandescent lamp and was calibrated by china seprei laboratory.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using  $4\pi$  geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

### Test Conditions

Temperature	25.1°C	Orientation	Vertical
Operating Time	45 mins	Stabilization Time	40 mins

### Test Results

Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	119.97	60	0.792	0.997	94.7
Test Type	CCT (K)	CRI	Lumen Output (lm)	Luminous Efficacy (lm/W)	
Output	4106	75	11169	117.9	



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### Test Condition

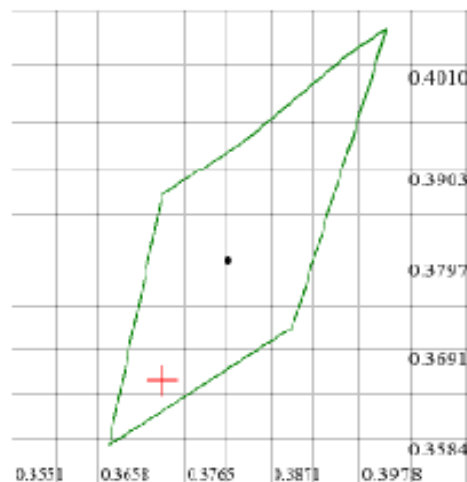
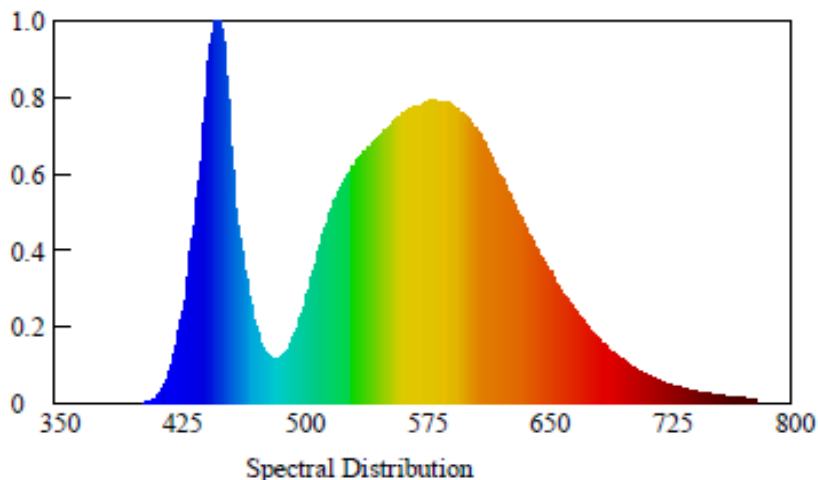
Temperature: 25.1°C

RH: ----%

Spectrum Range: 380-780 nm

Scan Step: 1 nm

### Spectroradiometric Parameters



Nominal CCT: LED 4000K  
x0=0.3737 y0=0.3654

Chromaticity Coordinates: x=0.3737 y=0.3654 u'=0.2252 v'=0.4955

Correlated Color Temperature: 4106 K

Dominant Wavelength: 579.0 nm(E)

Luminous Flux: 11168.540 lm

Purity: 0.2188

Chromaticity Difference: -0.0034Duv

Peak Wavelength: 451.6 nm

Color Ratio: Kr=37.2% Kg=56.0% Kb=6.8%

Bandwidth: 22.8nm

Radiant Flux: 30.667 W

Rendering Index: Ra=74.6

R1=73 R2=81 R3=85 R4=73 R5=71 R6=71 R7=83 R8=59

R9=-10 R10=52 R11=68 R12=42 R13=75 R14=91 R15=70



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## Test Flow 2: Goniophotometer Test

### Environmental Conditions

### Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-GS001	Goniophotometer	Before Use	Before Use
GVS-LE-PE007	Digital Power Meter	2016-05-17	2017-05-16
GVS-LE-FS007	Measurement Standard Lamp	2016-07-29	2017-07-28

### Test Method

The sample was tested according to the IES LM-79-2008.

The samples were tested fully and properly mounted in the troffer, Lithonia 2SP8 lensed 2x2.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at 25° C ± 1° C, measured at a point not more than 1 m from the sample and at the same height as the sample. The reference standard lamp is 100W omni-directional incandescent lamp and was calibrated by china seprei laboratory.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.

### Test Conditions

Temperature	25.1°C	Orientation	Vertical
Operating Time	1 hour 45 mins	Stabilization Time	45 mins

### Test Results

Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	120.09	60	0.801	0.996	95.8
Test Type	Lumen Output (lm)	Center Beam Candle Power (cd)	Zonal Lumen Distribution		Luminous Efficacy (lm/W)
			20-50°		
Output	11041	8386	54.8%		115.2

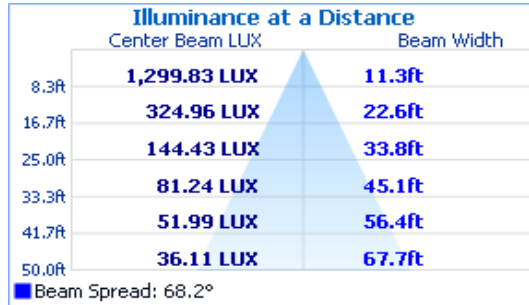


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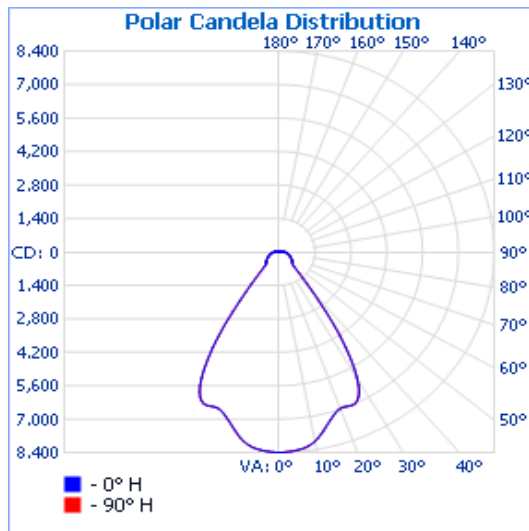
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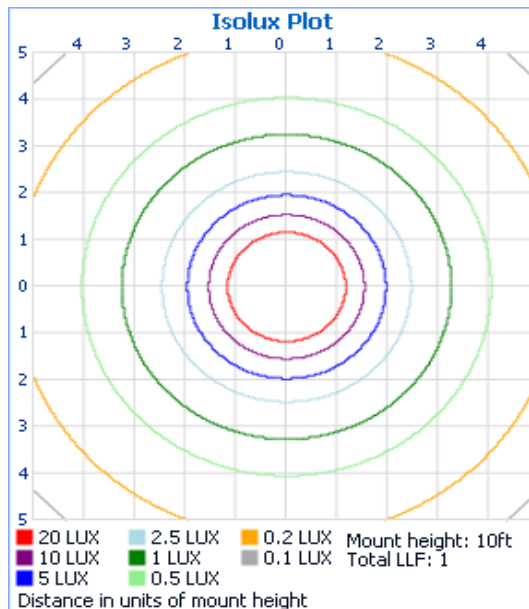
## Illuminance at a Distance



## Polar Candela Distribution



## Isolux Plot





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## Zonal Lumen Tabulation

### Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	6,029.8	54.6%
0-40	8,284.5	75%
0-60	9,473.4	85.8%
60-90	1,108.3	10%
70-100	826.4	7.5%
90-120	326.5	3%
0-90	10,581.7	95.8%
90-180	459.4	4.2%
0-180	11,041.1	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	199.7	1.8%	90-95	105.4	1%
5-10	586.6	5.3%	95-100	82.2	0.7%
10-15	915.8	8.3%	100-105	59.9	0.5%
15-20	1,177.9	10.7%	105-110	39.5	0.4%
20-25	1,466.5	13.3%	110-115	23.9	0.2%
25-30	1,683.3	15.2%	115-120	15.6	0.1%
30-35	1,456.4	13.2%	120-125	13.1	0.1%
35-40	798.4	7.2%	125-130	13.7	0.1%
40-45	366.8	3.3%	130-135	16.4	0.1%
45-50	282.6	2.6%	135-140	19.2	0.2%
50-55	276.4	2.5%	140-145	19.0	0.2%
55-60	263.1	2.4%	145-150	16.5	0.1%
60-65	245.0	2.2%	150-155	12.8	0.1%
65-70	224.5	2.0%	155-160	9.2	0.1%
70-75	196.7	1.8%	160-165	6.3	0.1%
75-80	172.4	1.6%	165-170	3.9	0%
80-85	146.2	1.3%	170-175	2.1	0%
85-90	123.4	1.1%	175-180	0.7	0%



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## Intensity Data(cd)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	360
0	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386
1	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386	8386
2	8376	8376	8376	8376	8376	8376	8376	8376	8376	8376	8376	8376	8376	8376	8376	8376	8376
3	8362	8362	8362	8362	8362	8362	8362	8362	8362	8362	8362	8362	8362	8362	8362	8362	8362
4	8344	8344	8344	8344	8344	8344	8344	8344	8344	8344	8344	8344	8344	8344	8344	8344	8344
5	8323	8323	8323	8323	8323	8323	8323	8323	8323	8323	8323	8323	8323	8323	8323	8323	8323
6	8295	8295	8295	8295	8295	8295	8295	8295	8295	8295	8295	8295	8295	8295	8295	8295	8295
7	8256	8256	8256	8256	8256	8256	8256	8256	8256	8256	8256	8256	8256	8256	8256	8256	8256
8	8203	8203	8203	8203	8203	8203	8203	8203	8203	8203	8203	8203	8203	8203	8203	8203	8203
9	8134	8134	8134	8134	8134	8134	8134	8134	8134	8134	8134	8134	8134	8134	8134	8134	8134
10	8043	8043	8043	8043	8043	8043	8043	8043	8043	8043	8043	8043	8043	8043	8043	8043	8043
11	7937	7937	7937	7937	7937	7937	7937	7937	7937	7937	7937	7937	7937	7937	7937	7937	7937
12	7810	7810	7810	7810	7810	7810	7810	7810	7810	7810	7810	7810	7810	7810	7810	7810	7810
13	7680	7680	7680	7680	7680	7680	7680	7680	7680	7680	7680	7680	7680	7680	7680	7680	7680
14	7545	7545	7545	7545	7545	7545	7545	7545	7545	7545	7545	7545	7545	7545	7545	7545	7545
15	7416	7416	7416	7416	7416	7416	7416	7416	7416	7416	7416	7416	7416	7416	7416	7416	7416
16	7297	7297	7297	7297	7297	7297	7297	7297	7297	7297	7297	7297	7297	7297	7297	7297	7297
17	7184	7184	7184	7184	7184	7184	7184	7184	7184	7184	7184	7184	7184	7184	7184	7184	7184
18	7090	7090	7090	7090	7090	7090	7090	7090	7090	7090	7090	7090	7090	7090	7090	7090	7090
19	7018	7018	7018	7018	7018	7018	7018	7018	7018	7018	7018	7018	7018	7018	7018	7018	7018
20	6971	6971	6971	6971	6971	6971	6971	6971	6971	6971	6971	6971	6971	6971	6971	6971	6971
25	7004	7004	7004	7004	7004	7004	7004	7004	7004	7004	7004	7004	7004	7004	7004	7004	7004
30	6073	6073	6073	6073	6073	6073	6073	6073	6073	6073	6073	6073	6073	6073	6073	6073	6073
35	3720	3720	3720	3720	3720	3720	3720	3720	3720	3720	3720	3720	3720	3720	3720	3720	3720
40	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431	1431
45	753	753	753	753	753	753	753	753	753	753	753	753	753	753	753	753	753
50	665	665	665	665	665	665	665	665	665	665	665	665	665	665	665	665	665
55	605	605	605	605	605	605	605	605	605	605	605	605	605	605	605	605	605
60	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535	535
65	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475	475
70	413	413	413	413	413	413	413	413	413	413	413	413	413	413	413	413	413
75	347	347	347	347	347	347	347	347	347	347	347	347	347	347	347	347	347
80	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296	296
85	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244	244
90	209	209	209	209	209	209	209	209	209	209	209	209	209	209	209	209	209
95	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173	173
100	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131	131
105	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93	93
110	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
115	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
120	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
125	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
130	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
135	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
140	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56	56
145	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57	57
150	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54	54
155	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47	47
160	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41
165	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
170	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
175	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
180	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28





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## Test Flow 3: THD and PF Test

### Environmental Conditions

Temperature: 25.1 °C

### Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-PE007	Digital Power Meter	2016-05-17	2017-05-16
GVS-LE-PS047	Power Supply	----	----

### Test Sample

730238-S001

### Test Method

The samples were tested according to the ANSI C82.77-2002. The ambient temperature condition was maintained at 25° C ± 1° C. The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

### Test Results

Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Current THD	Power (W)
Input	276.99	60	0.354	0.952	14.0%	93.3



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Photos of sample



**End of Test Report**