

**Verification Services**

Project No. 4787070113-3  
 Report No. 4787070113-3a  
 Report Issued Date: 2016-04-26

# Test Report

<b>Customer Company &amp; Address:</b>			
SORAA Inc ADD: 6500 Kaiser Dr, Fremont, CA 94555			
<b>Contact Person:</b>	Steve Yang		
<b>Phone Number:</b>	510-4567183	<b>Email Address:</b>	SYang@soraa.com

<b>Relevant Standards:</b>	IES LM-79-2008		
<b>Product Description:</b>	Integral LED Lamp, PAR16 GU10		
<b>Brand Name:</b>	SORAA		
<b>Tested Model Number:</b>	SM16GA-07-10D-930-03		
<b>Product Family:</b>	N/A		
<b>Allowable Variations:</b>	N/A		
<b>Electrical Specification:</b>	120 V AC, 60 Hz, 7.5 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>	2015-08-28	<b>Test Date:</b>	2015-08-30
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Tested By	Approved By
<i>Derek</i> / Derek Zhang	<i>Candy Zhang</i> / Candy Zhang
<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	2210452-S001	Evaluate by customer
2	Goniophotometer Test	2210452-S001	Evaluate by customer

## Deviation from Test Method (if any)

N/A

## Remark (if any)

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



# Test Report

## Test Flow 1: Integrating Sphere Test

### Environmental Conditions

Temperature: 25.1°C

### Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-PE002	Integrating Sphere	Before Use	Before Use
GVS-LE-FS019	Measurement Standard Lamp	2015-08-21	2016-08-20

### Test Sample

2210452-S001

### 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° C ± 1° C. The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. 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 Results

Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	119.90	60	0.065	0.962	7.5

Test Type	CCT (K)	CRI	Lumen Output (lm)	Luminous Efficacy (lm/W)
Output	2955	96	419	56.1



# Test Report

## Test Condition

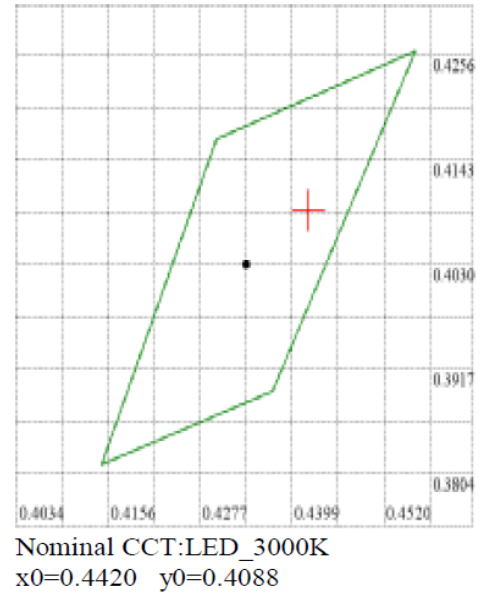
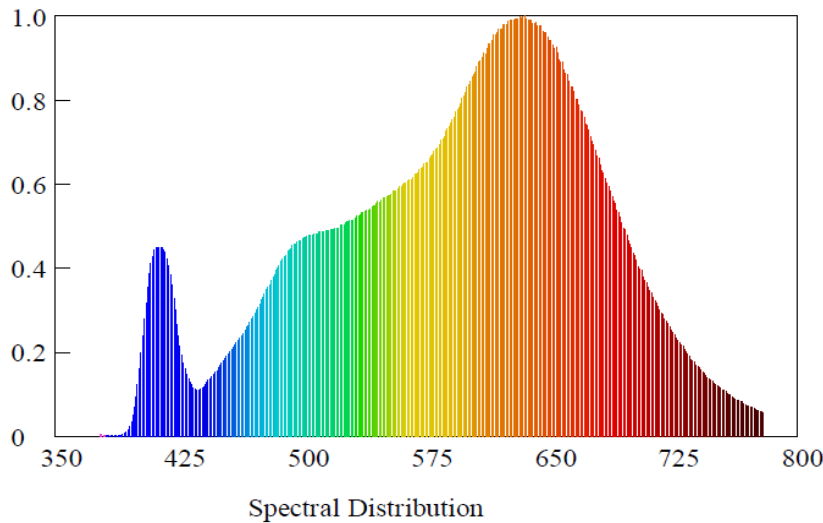
Temperature: 25.1°C

RH: ----%

Spectrum Range: 380-780 nm

Scan Step: 1 nm

## Spectroradiometric Parameters



Chromaticity Coordinates: x=0.4420 y=0.4088 u'=0.2518 v'=0.524

Correlated Color Temperature: 2955 K

Dominant Wavelength: 581.0 nm(E)

Luminous Flux: 418.655 lm

Purity: 0.5561

Chromaticity Difference: +0.00121Duv

Peak Wavelength: 635.1 nm

Color Ratio: Kr=43.9% Kg=46.3% Kb=9.8%

Bandwidth: 166.9nm

Radiant Flux: 1.68 W

Rendering Index: Ra=95.7

R1=95 R2=97 R3=97 R4=94 R5=94 R6=92 R7=98 R8=99

R9=99 R10=92 R11=90 R12=81 R13=95 R14=99 R15=98



# Test Report

## Test Flow 2: Goniophotometer Test

### Environmental Conditions

Temperature: 25.1°C

### Test Equipment

Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
GVS-LE-GS002	Goniophotometer	Before Use	Before Use
GVS-LE-FS019	Measurement Standard Lamp	2015-08-21	2016-08-20

### Test Sample

2210452-S001

### Test Method

The sample was tested according to the IES LM-79-2008.  
 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 samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 22.5° horizontal intervals.

### Test Results

Test Type	Voltage (V AC)	Frequency (Hz)	Current (A)	Power Factor	Power (W)
Input	120.08	60	0.065	0.962	7.5

Test Type	Lumen Output (lm)	Center Beam Candle Power (cd)	Field angle (10%)		Beam angle (50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
Output	422	6188	19.9	19.9	12.0	12.0	56.0



# Test Report



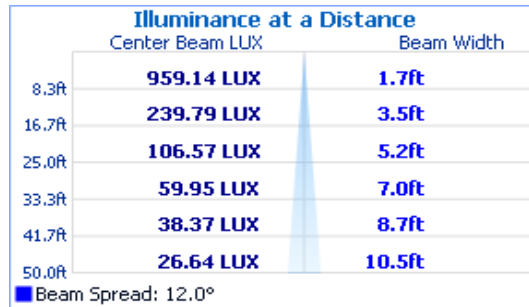
NVLAP Lab Code: 200952-0



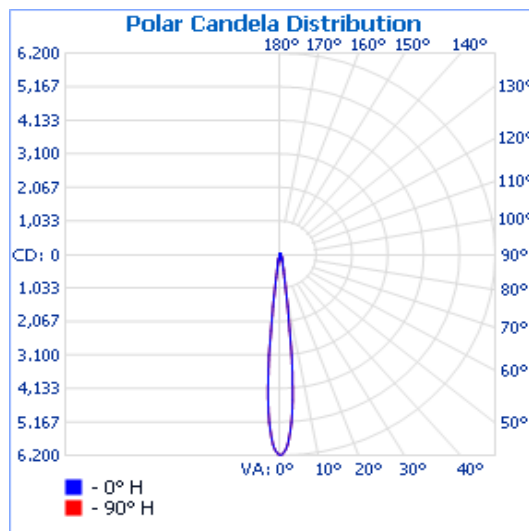
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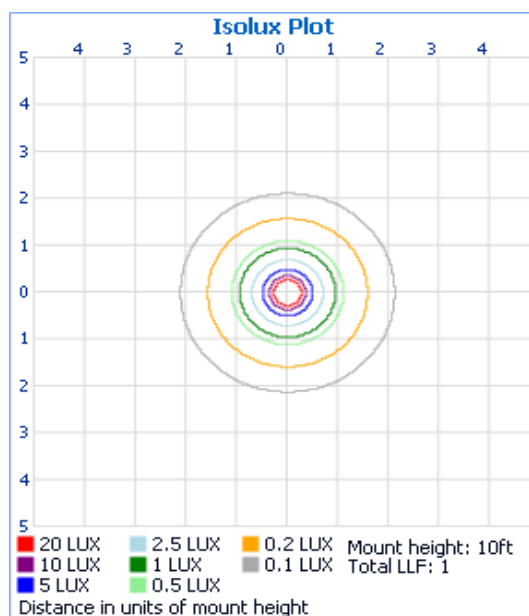
### Illuminance at a Distance



### Polar Candela Distribution



### Isolux Plot





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## Zonal Lumen Tabulation

### Zonal Lumen Summary

Zone	Lumens	% Luminaire
0-30	344.3	81.7%
0-40	370.9	88%
0-60	398.6	94.5%
60-90	22.8	5.4%
70-100	11.1	2.6%
90-120	0.0	0%
0-90	421.5	100%
90-180	0.2	0%
0-180	421.6	100%

### Lumens Per Zone

Zone	Lumens	% Total	Zone	Lumens	% Total
0-5	123.3	29.3%	90-95	0.0	0%
5-10	120.5	28.6%	95-100	0	0%
10-15	42.1	10.0%	100-105	0	0%
15-20	25.2	6.0%	105-110	0	0%
20-25	18.0	4.3%	110-115	0	0%
25-30	15.1	3.6%	115-120	0	0%
30-35	13.9	3.3%	120-125	0	0%
35-40	12.7	3.0%	125-130	0	0%
40-45	9.8	2.3%	130-135	0.0	0%
45-50	6.5	1.5%	135-140	0.0	0%
50-55	5.8	1.4%	140-145	0.0	0%
55-60	5.7	1.3%	145-150	0.0	0%
60-65	5.8	1.4%	150-155	0.0	0%
65-70	5.9	1.4%	155-160	0.0	0%
70-75	5.2	1.2%	160-165	0.0	0%
75-80	3.8	0.9%	165-170	0.0	0%
80-85	1.8	0.4%	170-175	0.0	0%
85-90	0.3	0.1%	175-180	0.0	0%



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Intensity Data(cd)

Table with 18 columns (0 to 360) and 20 rows (0 to 180). Title: Candela Table - Type C. Contains intensity data in candelas.



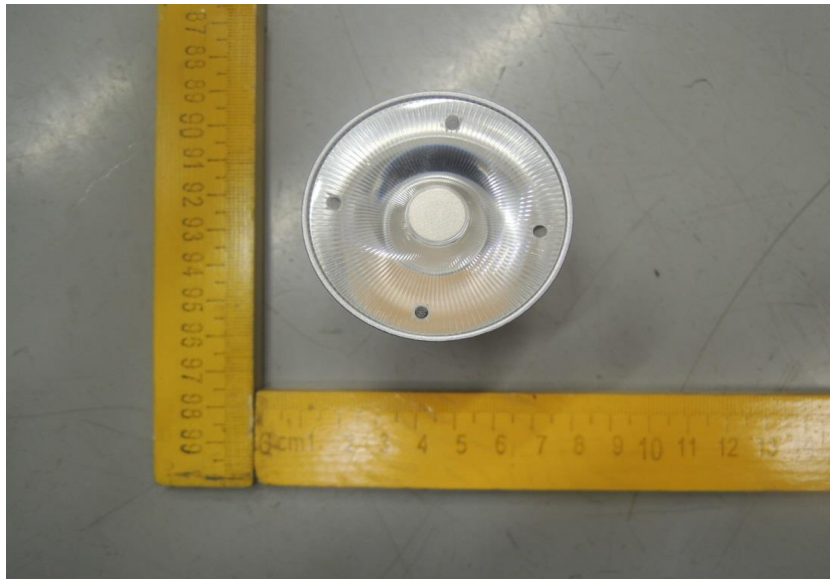


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## Photos of sample



**End of Test Report**