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Test report of

IES LM-79-08

Approved Method: Electrical and Photometric

Measurements of Solid-State Lighting Products

Rendered to:

P.Q.L., Inc.

2285 Ward Avenue

Simi Valley, CA 93065

For products:

SSL downlight retrofits

Models: 90906

Test date: April 14,2014

Test laboratory: LCTECH (Zhongshan) Testing Service Co.,Ltd
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Xiaolan, Zhongshan, Guangdong, China

Laboratory note: *N.A*

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April 16, 2014

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April 16, 2014

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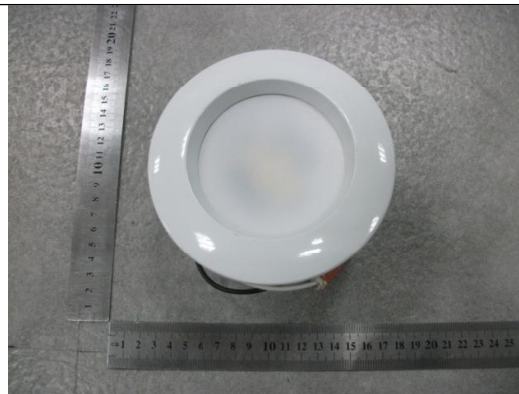
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1 General

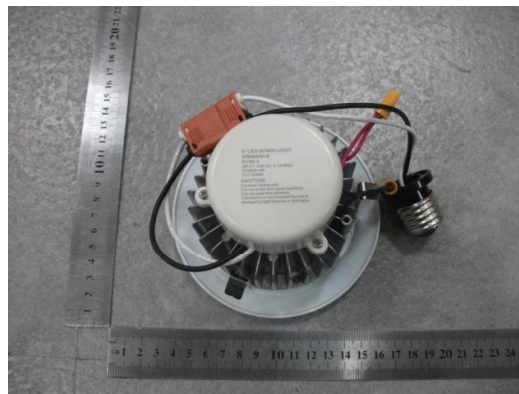
1.1 Product Information

Brand Name	Superior Life®
Trade Mark	
Luminaire Type	SSL downlight retrofit
Model Number	90906
Rated Inputs	120VAC,60Hz
Rated Power	9 W
Rated Initial Lamp Lumens	680 lm
Declared CCT	5000 K
Power Supply	LED Driver, Model: Not provided
LED Package, Array or Module	Not provided
Date of Receipt Samples	April 3, 2014
Quantity of Receipt Samples	1 units

Photo



Picture 1



Picture 2



LCTECH



1.2 Standards or methods

The following standards are partly or totally used or referenced for test:

No.	Name
ANSI/NEMA/ ANSLG C78.377-2011 [#]	Specifications for the Chromaticity of Solid State Lighting Products
ANSI C82.77-2002	Harmonic Emission Limits—Related Power Quality Requirements for Lighting Equipment
CIE Pub. No. 13.3-1995	Method of Measuring and Specifying Color Rendering of Light Sources
CIE Pub. No. 15:2004	Colorimetry
IES LM-79-08	Electrical and Photometric Measurements of Solid-State Lighting Products

[#] For reference only.

1.3 Equipment list

ID	Instrument	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2014-03-04	2015-03-03
AC Power supply	LC-I-953	APW-110N	2014-03-04	2015-03-03
Power analyzer	LC-I-928	WT210	2014-03-21	2015-03-20
Power analyzer	LC-I-954	WT210	2014-03-04	2015-03-03
Multimeter	LC-I-972	Fluke 17B	2013-08-14	2014-08-13
Photometric colorimetric electric system (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-I-971	STD-ESN	2013-04-22	2014-04-21
Goniophotometer(with mirror)	LC-I-902	GMS2000	2013-05-13	2014-05-12
Wireless temperature transmitter	LC-I-958	DWRP-B(0)	2013-08-22	2014-08-21
Wireless temperature transmitter	LC-I-959	DWRP-B(0)	2013-08-22	2014-08-21



2 Test conducted and method

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, the air flow around the sample(s) being tested did not affect the performance.

2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within ± 0.2 percent under load.

2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

2.4 Electrical Instrumentation

The calibration uncertainties of the instruments for AC voltage and current were less than 0.2 percent, and the calibration uncertainty of the AC power meter was less than 0.5 percent (95 % confidence interval, $k=2$).

2.5 Color Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the color characteristics (Color rendering index, correlated color temperature, chromaticity coordinate) were calculated from these by software automatically.

2.6 Total Luminous Flux Measurement Method

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system, and the total luminous flux was calculated from these by software automatically.



3 Test Result Summary

3.1 Electrical data

Criteria Item	Result (Sphere)
Input Voltage	120.07 V~60Hz
Input Current	0.078 A
Total Power	9.1 W
Power Factor	0.978
I-THD	12.85 %

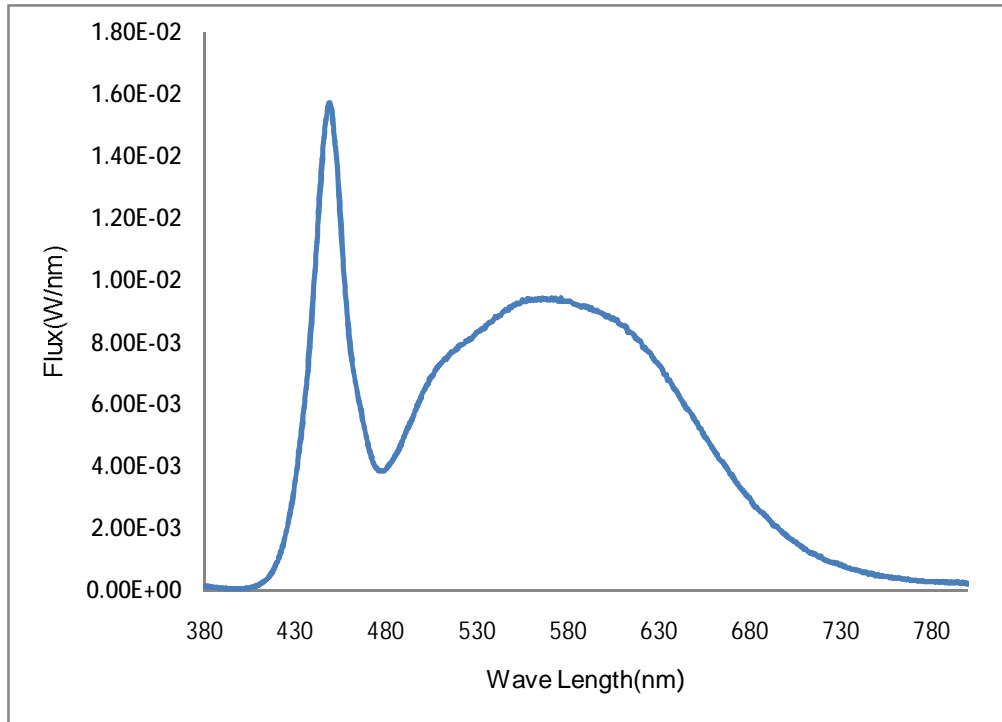
3.2 Photometric data

Criteria Item	Result (Sphere)
Total Lumens	686.21 lm
Luminaire Efficacy	75.41 lm/W
Correlated Color Temperature (CCT)	5084 K
Color Rendering Index (CRI)	85.7
R9	32
Chromaticity Coordinate (x,y)	x= 0.3429 y= 0.3503
Chromaticity Coordinate (u,v)	u= 0.2104 v= 0.3225
Chromaticity Coordinate (u',v')	u'= 0.2104 v'= 0.4837
Duv	+0.00027

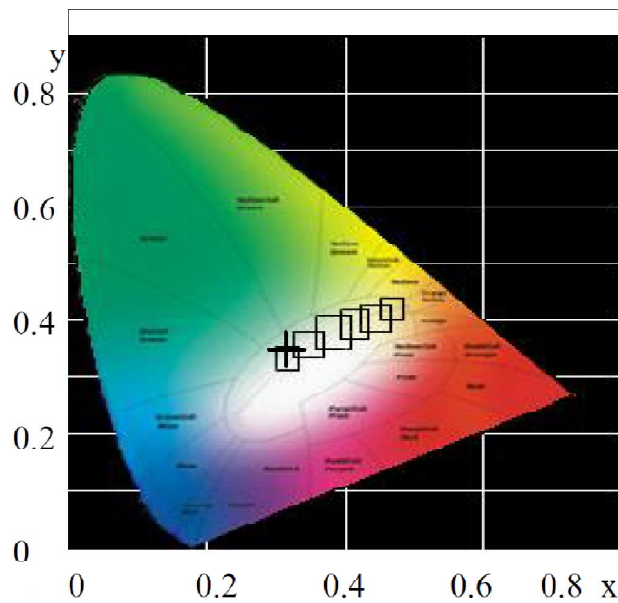
Note: N/A

4 Test Data

4.1 Spectral Distribution

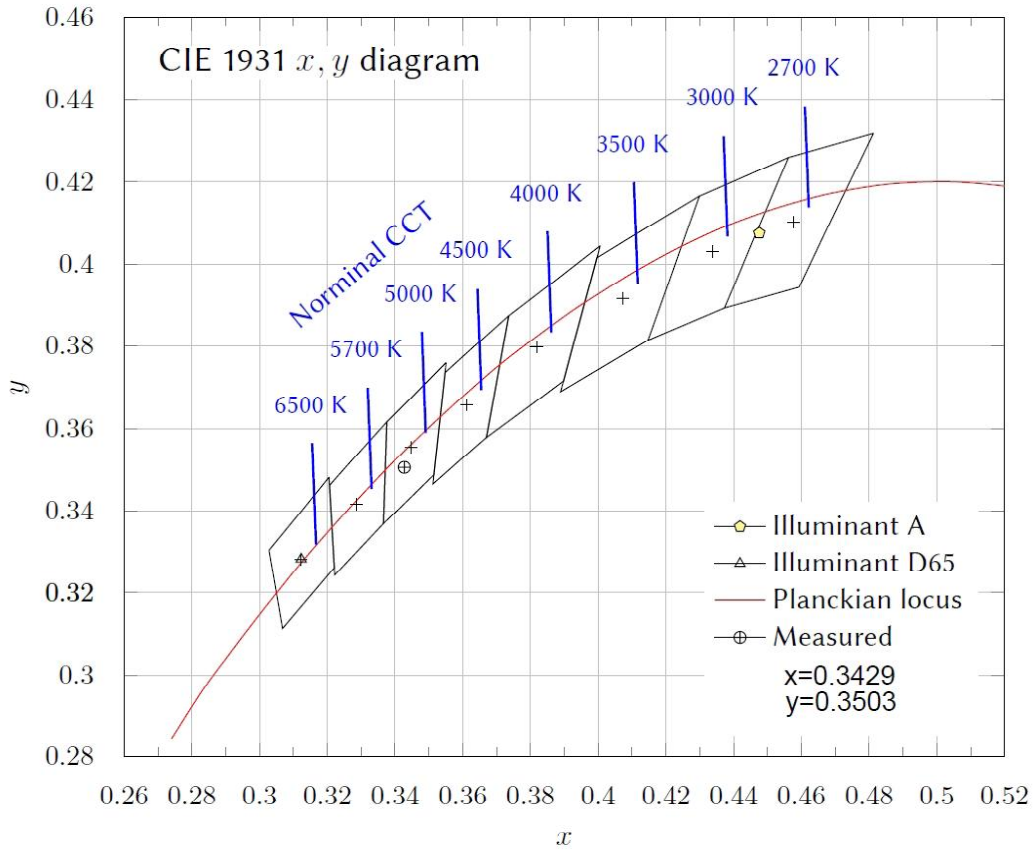


4.2 Chromaticity Diagram (CIE 1931)





4.3 ANSI Chromaticity Quadrangles Diagram



4.4 Color Rendering Details

R1	R2	R3	R4	R5
85	89	90	87	86
R6	R7	R8	R9	R10
84	89	76	32	73
R11	R12	R13	R14	R15
86	68	86	94	82

****End of test report****