Test Report

Report No.: EED35I000458-3 Page 1 of 6

Customer : Revolution Lighting Technologies Inc
Address : 4139 Guardian St Simi Valley, CA, 93063 United States

Description of the submitted sample(s):

Sample Name	: LED TUBE
Model/Type	: 202421-115
Sample No.	: 35I0458-05
Brand	: RVLT
LED Driver Model	: 200000-P02
Ratings	: 100-277 V AC, 50/60 Hz, 18W, 5000 K
Test Item	: Total Luminous Flux, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical Parameters
State of Sample(s)	: Normal
Sample Quantity	: 1pc
Manufacturer	: Longhorn Lighting Co., Ltd
LED Driver Manufacturer	: Longhorn Lighting Co., Ltd
Sample Received Date	: Aug. 02, 2016
Sample Tested Date	: Aug. 04, 2016
Test Requested	: All test items were measured according to IES LM-79-08 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products
Remarks	: LED T8 replacement lamp with 2 feet length, fixed G13 base, 2-lamp External driver lamp style Retrofit kits (UL Type C), Frosted lens

Laboratory Note: The laboratory that conducted the testing items in this report has been accredited by the National Voluntary Laboratory Accreditation Program (NVLAP LAB CODE: 200889-0), for IES LM-79 testing of SSL products. And the report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Compiled by _____ Reviewed by _____

CENTRE TESTING INTERNATIONAL PINBIAO(SHANGHAI) CO., LTD. CTI Report Seal

Approved by _____ Date Sept. 01, 2016

Supervisor/Engineer Check No.: 2447624940

CENTRE TESTING INTERNATIONAL CORPORATION NO.1996, Xin jin qiao Road, Pudong New District, Shanghai, 201206, China

Test Report

Equipment list:

Test Equipment	Equipment Model	Equipment No.	Calibration Date	Calibration Due Date
Spectroradiometer	HAAS-2000	TTF20120376	---	---
Integrating Sphere	2.0m	ATTEELSH00007	---	---
Standard Lamp	D204	TTE20141711	Jul. 06, 2016	Jul. 05, 2017
Digital Power Meter	PF2010	ATTEELSH00011	Jun. 17, 2016	Jun. 16, 2017

1 Test Condition

Ambient Condition	: 24.6℃
Photometric Method	: Sphere-spectroradiometer
Colorimetric Method	: Sphere-spectroradiometer
Tested	: 120 V AC, 60 Hz
Stabilization Time	: 30 minutes
Total Operation Time including Stabilization	: 35 minutes
Orientation	: Horizontal, Light Downwards

2 Test Method

2.1 Requirements of Ambient Condition

The ambient temperature in which measurements are being taken shall be maintained at 25℃ ± 1℃, measured at a point not more than 1 m from the SSL product and at the same height as the SSL product. Air flow around the SSL product being tested should be such that normal convective air flow induced by device under test is not affected.

2.2 Seasoning of SSL Product

For the purpose of rating new SSL products, SSL products shall be tested with no seasoning.
Therefore, no seasoning was performed.

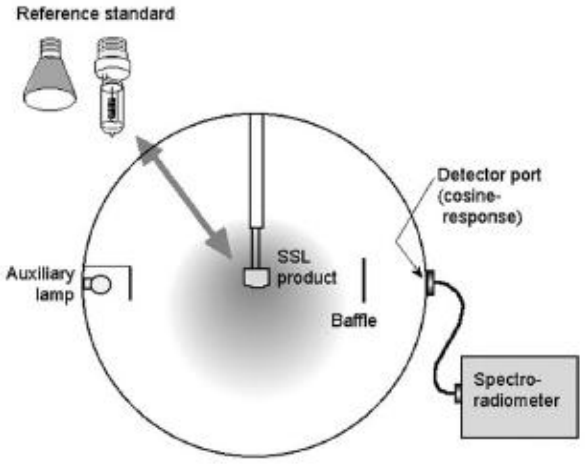
2.3 Stabilization of SSL Product

Before measurements are taken, the SSL product under test shall be operated long enough to reach stabilization and temperature equilibrium. The time required for stabilization depends on the type of SSL products under test. The stabilization time typically ranges from 30 min for small integrated LED lamps to 2 or more hours for large SSL luminaires. It can be judged that stability is reached when the variation (maximum – minimum) of at least 3 readings of the light output and electrical power over a period of 30min, taken 15 minutes apart, is less than 0.5%.

Test Report

2.4 Photometric and Electrical Measurements - Sphere-spectroradiometer Method

A CCD Spectroradiometer and 2m or 50cm Integrating Sphere was used to measure total luminous flux correlated color temperature, color rendering index, and chromaticity coordinates. The 4π geometry, shown as following, is used for measurement. Ambient temperature was measured at a position inside the integrating sphere. Electrical measurements including voltage, current, and power were measured using the Digital Power Meter.



3 Test Results

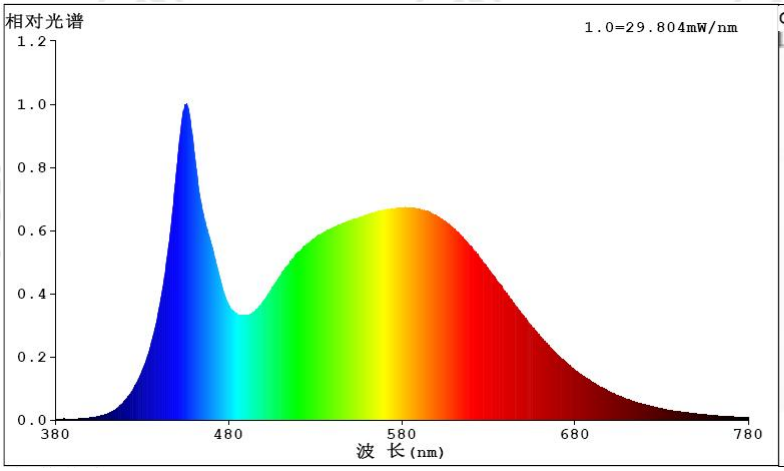
3.1 Summary

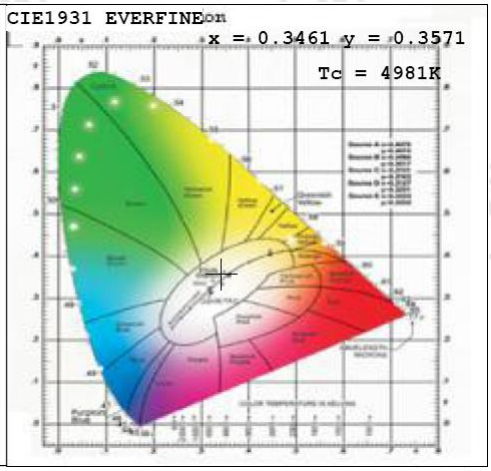
Input Voltage (V AC)	Input Current (A)	Input Power (W)	Power Factor	Total Luminous Flux (lm)
120.0	0.07555	9.01	0.9936	1329.6
Luminous Efficacy (lm/W)	**Chromaticity Coordinate x**	**Chromaticity Coordinate y**	**Chromaticity Coordinate u'**	**Chromaticity Coordinate v'**
147.65	0.3461	0.3571	0.2100	0.4875
Correlated Color Temperature (K)	**Color Rendering Index/R_a**	**Color Rendering Index/R_9**	**Duv**	**---**
4981	83.9	15	0.0023	---

Test Report

3.2 Spectral Power Distribution and Chromaticity Diagram

nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm	nm	mW/nm
380	0.141	465	19.8	550	18.77	635	13.17	720	1.473
385	0.1386	470	16.7	555	19.1	640	12.07	725	1.26
390	0.1166	475	13.47	560	19.35	645	10.97	730	1.08
395	0.156	480	10.93	565	19.62	650	9.912	735	0.938
400	0.2276	485	10.01	570	19.81	655	8.882	740	0.8017
405	0.3403	490	9.859	575	19.94	660	7.915	745	0.6883
410	0.5916	495	10.22	580	20.01	665	7.01	750	0.5912
415	1.05	500	11.19	585	20.01	670	6.168	755	0.5089
420	1.829	505	12.43	590	19.9	675	5.414	760	0.4347
425	3.002	510	13.66	595	19.67	680	4.727	765	0.3774
430	4.645	515	14.77	600	19.24	685	4.133	770	0.3253
435	7.04	520	15.75	605	18.72	690	3.577	775	0.2883
440	10.67	525	16.58	610	18.07	695	3.11	780	0.2588
445	15.94	530	17.16	615	17.28	700	2.685		
450	23.67	535	17.7	620	16.36	705	2.314		
455	29.71	540	18.13	625	15.33	710	1.979		
460	25.77	545	18.46	630	14.3	715	1.697		





Test Report

Photos of the Sample

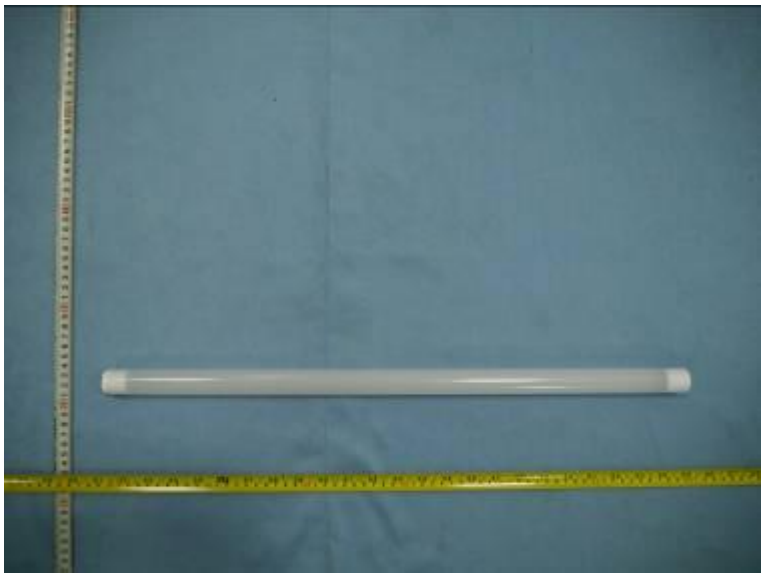


Fig.1- Overall view

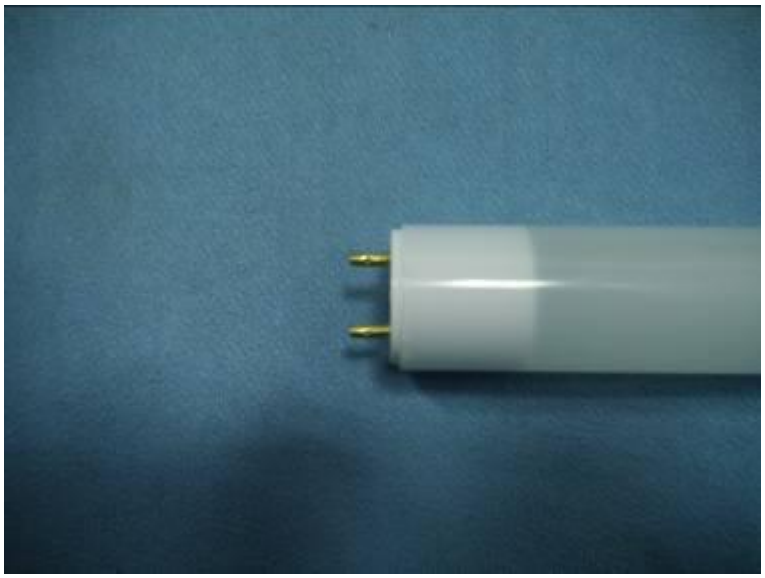


Fig.2- Partial view

Test Report

Fig.3- Overall view of LED Driver

*** End of Report ***

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