



LM-79-08 Test Report

for

MLS CO., LTD

NO.1 MULINSEN RD XIAOLAN TOWNSHIP ZHONGSHAN City, GUANGDONG

Linear Ambient Luminaires

Model: MT5Z02-6

Laboratory: Leading Testing Laboratories

NVLAP CODE: 200960-0

No.1805, DongLiu road, BinJiang District, Hangzhou, China

Tel: +86-571-56680806

www.ledtestlab.com

Report No.: HZ14090028g

The laboratory that conducted the testing detailed in this report has been accredited for SSL by NVLAP.

Review by:

Engineer: April Zou
Nov. 18, 2014

Approved by:



Manager: Jim Zhang
Nov. 18, 2014

Note: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government

Test Summary

Model	MT5Z02-6
Luminous Efficacy (Lumens /Watt)	101.7
Total Luminous Flux (Lumens)	1164.0
Power (Watts)	11.45
Power Factor	0.9879
CCT (K)	4986
CRI	83.2
Stabilization Time (Light & Power)	60 mins
Note	5000K, frosted lens

Table 1: Executive Data Summary

Test specifications:

Date of Receipt	: Sep. 28, 2014
Date of Test	: Nov. 18, 2014
Test item	: Total Luminous Flux, Luminous Efficacy, Correlated Color Temperature, Color Rendering Index, Chromaticity Coordinate, Electrical parameters
Reference Standard	: IESNA LM-79-2008 Approved Method for the Electrical and Photometric Measurements of Solid-State Lighting Products

TABLE OF CONTENT

LM-79-08 Test Report.....	1
Test Summary.....	2
Sample Photo.....	4
TEST RESULTS	5
Spectral Power Distribution - Sphere Spectroradiometer Method	6
Chromaticity Diagram - Sphere Spectroradiometer Method.....	7
Nominal CCT Quadrangles – Sphere Spectroradiometer Method	8
EQUIPMENT LIST	9
TEST METHODS	9
Seasoning of SSL Product.....	9
Sphere-Spectroradiometer Method- Photometric and Electrical Measurements.....	9

Sample Photo



Sample view

Equipment Under Test (EUT)

Name	: Linear Ambient Luminaires
Model	: MT5Z02-6
Electrical Ratings	: AC100-277V, 50-60Hz, 12W
Product Description	: 5000K, frosted lens, 2 foot tube Model of LED light source: E2835UZ28-R80 Manufacturer of light source: MLS Quantity of LED light source: 72pcs
Manufacturer	: MLS CO., LTD
Address	: NO.1 MULINSEN RD XIAOLAN TOWNSHIP ZHONGSHAN City, GUANGDONG

TEST RESULTS

Test ambient temperature was 24.6°C.

Test orientation was Light down. Test was conducted without a dimmer in the circuit.

The stabilization time of the sample was 60 minutes, and the total operating time including stabilization was 65 minutes.

Sphere-Spectroradiometer Method

Parameter	Result			Special Color Rendering Indices	
Test Voltage (V)	120.0	100.0	277.0	R1	80.3
Voltage frequency (Hz)	60	60	60	R2	87.3
Test Current (A)	0.097	0.116	0.049	R3	93.3
Power Factor	0.9879	0.9934	0.8708	R4	82.8
Test Power (W)	11.45	11.53	11.92	R5	81.2
THD A%	6.47	4.93	14.83	R6	82.9
Luminous Efficacy (lm/W)	101.7			R7	88.7
Total Luminous Flux (lm)	1164.0			R8	68.9
Color Rendering Index (CRI)	83.2			R9	10.2
R9	10.2			R10	70.6
Correlated Color Temperature (CCT)(K)	4986			R11	81.6
Chromaticity Chroma x	0.3464			R12	63.8
Chromaticity Chroma y	0.3626			R13	81.8
Chromaticity Chroma u	0.2081			R14	96.4
Chromaticity Chroma v	0.3267				
Duv	0.0049				
Chromaticity Chroma u'	0.2081				
Chromaticity Chroma v'	0.4901				

Table 2: Test data per Sphere-Spectroradiometer Method

Note: According to CIE 1976 (u',v') diagram, $u' = u = 4x/(-2x+12y+3)$, $v' = 3v/2 = 9y/(-2x+12y+3)$.

Spectral Power Distribution - Sphere Spectroradiometer Method

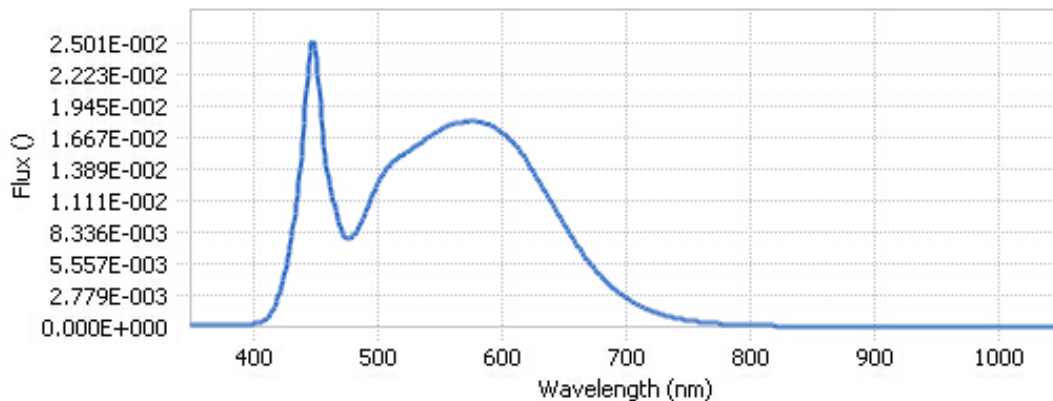
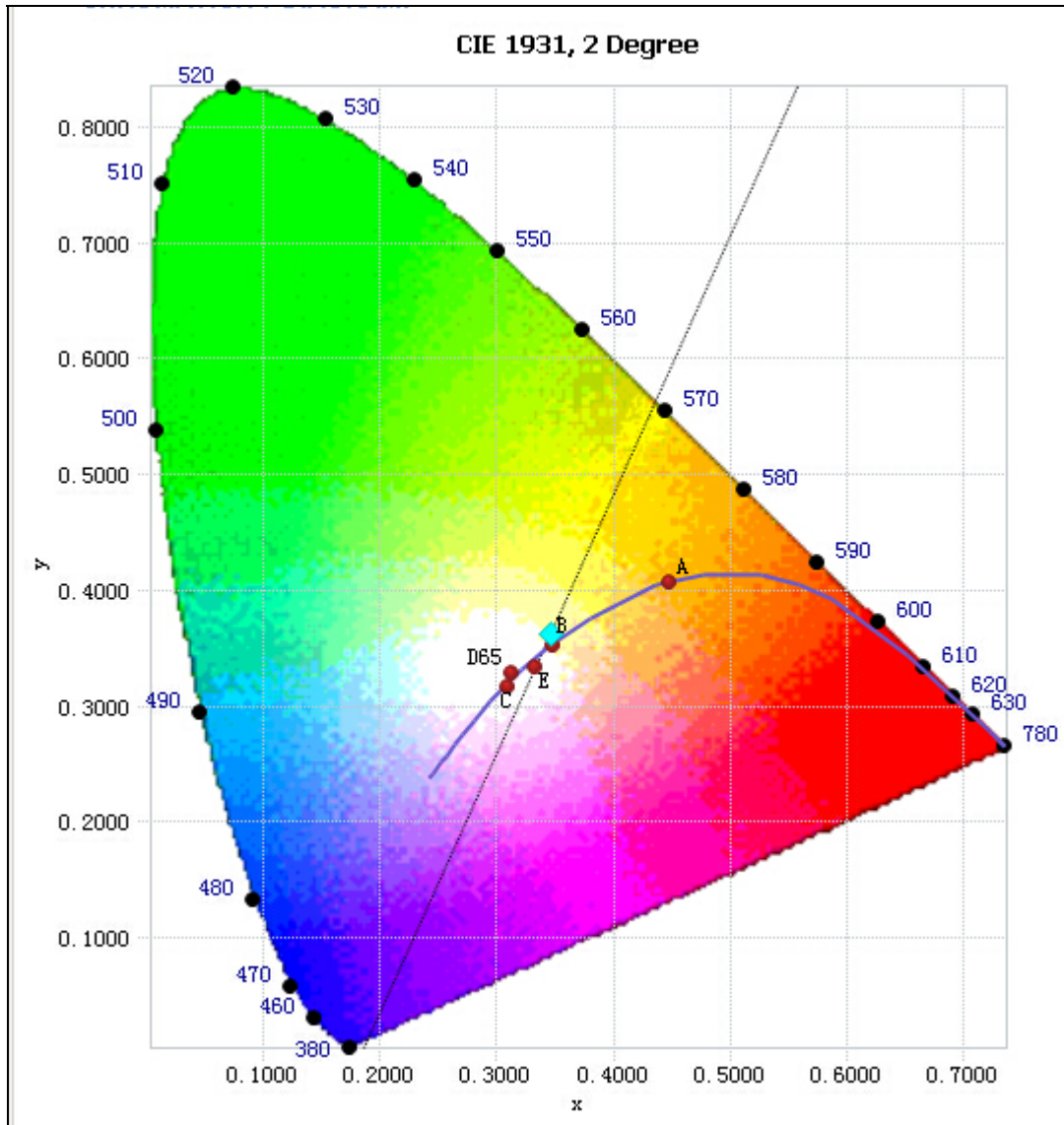


Chart 1: Spectral Power Distribution

Spectral Distribution over Visible Wavelength							
WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)	WL(nm)	Radiant(Watts)
380	1.68E-04	485	8.79E-03	590	1.78E-02	695	2.92E-03
385	1.76E-04	490	9.96E-03	595	1.75E-02	700	2.53E-03
390	1.97E-04	495	1.13E-02	600	1.71E-02	705	2.17E-03
395	2.10E-04	500	1.26E-02	605	1.67E-02	710	1.88E-03
400	2.56E-04	505	1.35E-02	610	1.61E-02	715	1.62E-03
405	3.38E-04	510	1.42E-02	615	1.54E-02	720	1.40E-03
410	5.87E-04	515	1.48E-02	620	1.46E-02	725	1.20E-03
415	1.26E-03	520	1.51E-02	625	1.38E-02	730	1.03E-03
420	2.52E-03	525	1.55E-02	630	1.28E-02	735	8.75E-04
425	4.46E-03	530	1.59E-02	635	1.19E-02	740	7.56E-04
430	7.26E-03	535	1.62E-02	640	1.09E-02	745	6.47E-04
435	1.09E-02	540	1.66E-02	645	9.96E-03	750	5.55E-04
440	1.63E-02	545	1.70E-02	650	9.04E-03	755	4.82E-04
445	2.32E-02	550	1.73E-02	655	8.12E-03	760	4.13E-04
450	2.44E-02	555	1.76E-02	660	7.28E-03	765	3.57E-04
455	1.83E-02	560	1.78E-02	665	6.43E-03	770	3.03E-04
460	1.35E-02	565	1.80E-02	670	5.73E-03	775	2.64E-04
465	1.09E-02	570	1.81E-02	675	5.03E-03	780	2.25E-04
470	8.78E-03	575	1.81E-02	680	4.41E-03		
475	7.76E-03	580	1.81E-02	685	3.85E-03		
480	7.92E-03	585	1.79E-02	690	3.35E-03		

Table 3: Spectral Power Distribution Numerical Data per Sphere - Spectroradiometer Method

Chromaticity Diagram - Sphere Spectroradiometer Method



Tristimulus values(x, y) : (0.3464, 0.3626)

Chart 2: Chromaticity Diagram per Sphere - Spectroradiometer Method

Note: The location on the diagram of the tristimulus coordinates are indicated by the blue diamond.

Nominal CCT Quadrangles – Sphere Spectroradiometer Method

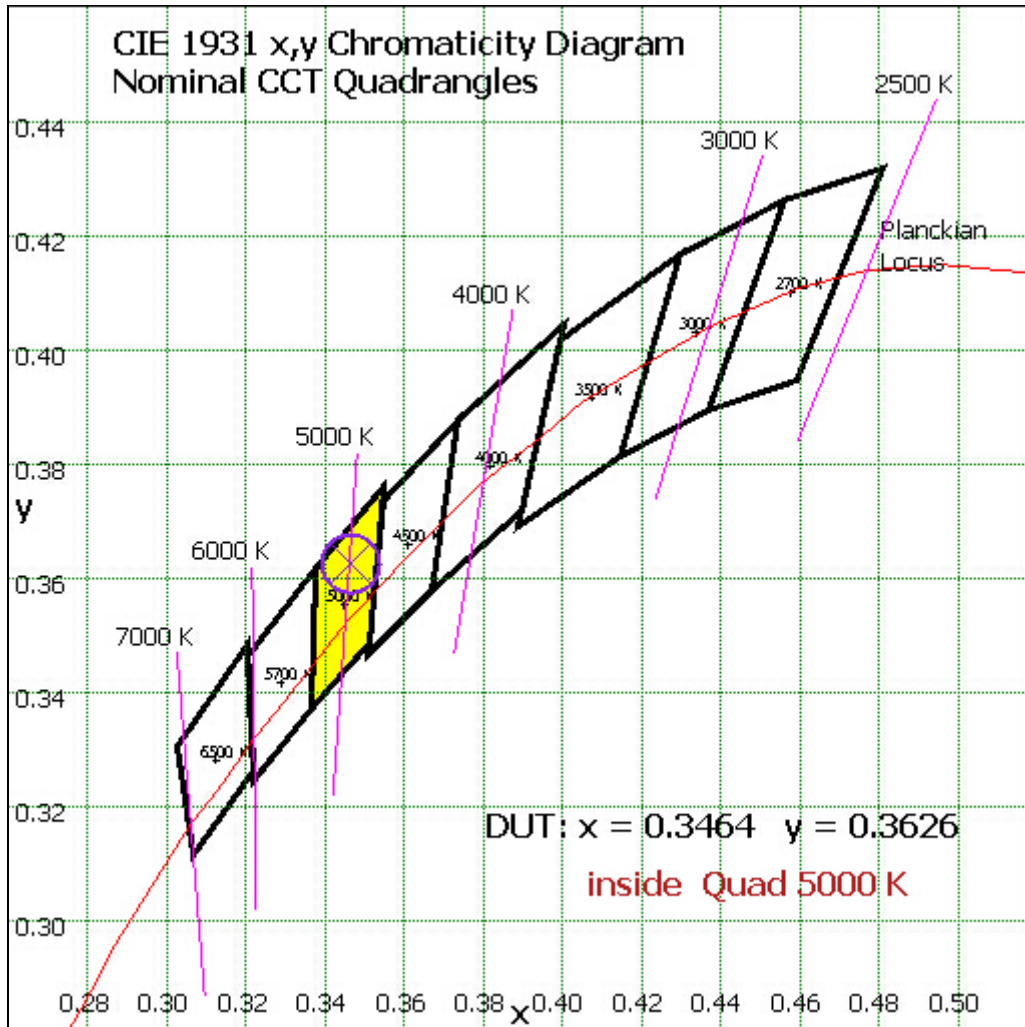


Chart 3: Plot of Lamp x/y coordinates on CIE 1931 Chromaticity Diagram

EQUIPMENT LIST

Test Equipment	Model	Equipment No.	Calibration Date	Calibration Due date
Integrate Sphere system	2M	HZTE015-01	Sep. 18, 2014	Sep. 17, 2015
Digital Power Meter	WT210	HZTE008-01	Sep. 18, 2014	Sep. 17, 2015
AC Power Supply	PCR 500L	HZTE001-07	Sep. 18, 2014	Sep. 17, 2015
DC Power Supply	6154	HZTE004-04	Sep. 18, 2014	Sep. 17, 2015
Temperature and humidity recorder	JR900	HZTE018-01	Sep. 18, 2014	Sep. 17, 2015
Standard source	SCL-1400	HZTE012-02	Sep. 18, 2014	Sep. 17, 2015

Table 4: Test Equipment List

TEST METHODS

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.

Sphere-Spectroradiometer Method- Photometric and Electrical Measurements

A Labsphere Model CDS 2100 Spectroradiometer and Two Meter Sphere was used to measure correlated color temperature, chromaticity coordinates, and the color rendering index for each SSL unit. The coating reflectance of each sphere is 98%. The measure geometry is 4π . Self-absorption correction is conducted in testing. Bandwidth of spectroradiometer is 350nm-1050nm.

Ambient temperature was measured at a position inside the sphere. Each SSL unit was operated on the client provided driver at the rated input voltage in its designated orientation.

The stabilization time typically ranges from 30 min (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 30 min, taken 15 minutes apart, is less than 0.5 %.

Electrical measurements including voltage, current, and power were measured using the Yokogawa Power Analyzer.

The standard reference of the integrated sphere system is halogen incandescent lamp, the intensity distribution type is omni-directional, and is traceable to the National Institute of Standards and Technology.

The uncertainty of integrating sphere system reported in this document is expanded uncertainty is 1.06% with a coverage factor $k=2$.

*** End of Report ***

This report is considered invalidated without the Special Seal for Inspection of the LTL. This report shall not be altered, increased or deleted. The results shown in this test report refer only to the sample(s) tested. Without written approval of LTL, this test report shall not be copied except in full and published as advertisement.