



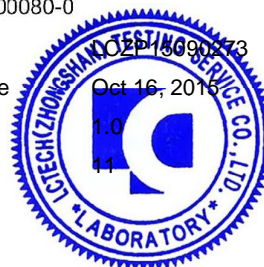
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Test report of

IES LM-79-08

Approved Method: Electrical and Photometric

Measurements of Solid-State Lighting Products

Rendered to:

Maxlite Inc.

10 York Avenue, West Caldwell, NJ 07006

For products:

2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces

Models:

MLVT22D3550/SB

Test date: Oct 9, 2015

Test laboratory: LCTECH (Zhongshan) Testing Service Co.,Ltd
2/F., Technology and Enterprise Development Center, Guangyuan Road,
Xiaolan, Zhongshan, Guangdong, China

Laboratory note: *This report was based on report LCZP15090273, there is no variation except for applicant and model number.*

Complied by:

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Project Engineer

Oct 16, 2015

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Technical Manager

Oct 16, 2015

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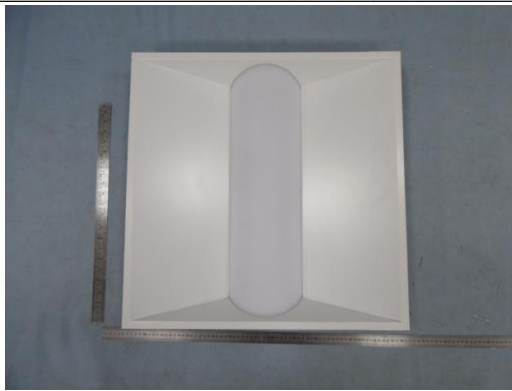
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1 General

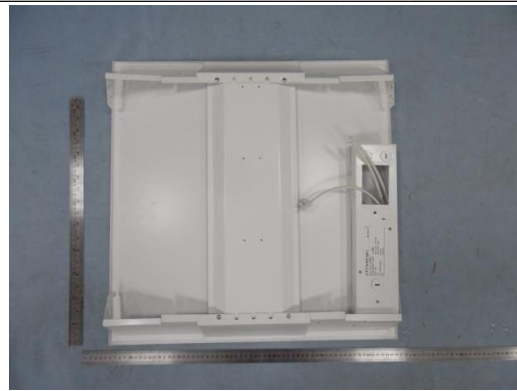
1.1 Product Information

Brand Name	Maxlite
Trade Mark	-
Category Type	Indoor---Troffer
Primary Use	2x2 Luminaires for Ambient Lighting of Interior Commercial Spaces
Model Number	MLVT22D3550/SB
Rated Inputs	100-277VAC 50/60Hz
Rated Power	35 W
Rated Initial Lumens	3150 lm
Declared CCT	5000 K
Power Supply type	Model: LPS40W-48-C0830-RD
LED Package, Array or Module	67-21S Series (3000K) , manufactured by EVERLIGHT ELECTRONICS CO., LTD
Date of Receipt Samples	Sep 25, 2015
Quantity of Receipt Samples	1 sample

Photo



Picture 1



Picture 2

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

1.3 Equipment list

ID	Instrument	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-923	CHP-500	2015-02-05	2016-02-04
AC Power supply	LC-I-987	APW-110N	2015-02-05	2016-02-04
Power analyzer	LC-I-928	WT210	2015-02-09	2016-02-08
Power analyzer	LC-I-954	WT210	2015-03-04	2016-03-03
Multimeter	LC-I-972	Fluke 17B	2015-08-17	2016-08-16
Photometric colorimetric electric system (2 meter sphere)	LC-I-900	SPR3000	Before use	Before use
Standard lamp	LC-I-946	110V/200W	2015-10-09	2016-10-09
Goniophotometer(with mirror)	LC-I-902	GMS2000	2015-04-11	2016-04-11
Wireless temperature transmitter	LC-I-958	DWRP-B(0)	2015-08-17	2016-08-16
Wireless temperature transmitter	LC-I-959	DWRP-B(0)	2015-08-17	2016-08-16

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

Total luminous flux was measured by goniophotometer.

Spectral radiant flux was measured by a sphere (2 meter)-spectroradiometer system.

Light intensity distribution was measured by a type C goniophotometer (with mirror) which can keep the sample in burn position when the tests conduct, and the total luminous flux was calculated from the intensity data by software automatically.

2.7 Luminous Intensity Distribution Measurement Method

Luminous intensity distribution was measured by a mirror-type goniophotometer (Type C) which can keep the sample in burn position when the tests conduct, and the kinds of graph were generated by software automatically.

2.8 Spatial Non-uniformity of Chromaticity

The customer did not require this measurement.

3 Test Result Summary

3.1 Electrical data

Criteria Item	Result (Sphere)	Result (Goniophotometer)
Input Voltage	120.00 V~60Hz	120.00 V~60Hz
Input Current	0.295 A	0.295 A
Total Power	35.27 W	35.27 W
Power Factor	0.996	0.995
THD	4.8 %	-
Off-state Power	0.0 W	-

3.2 Photometric data

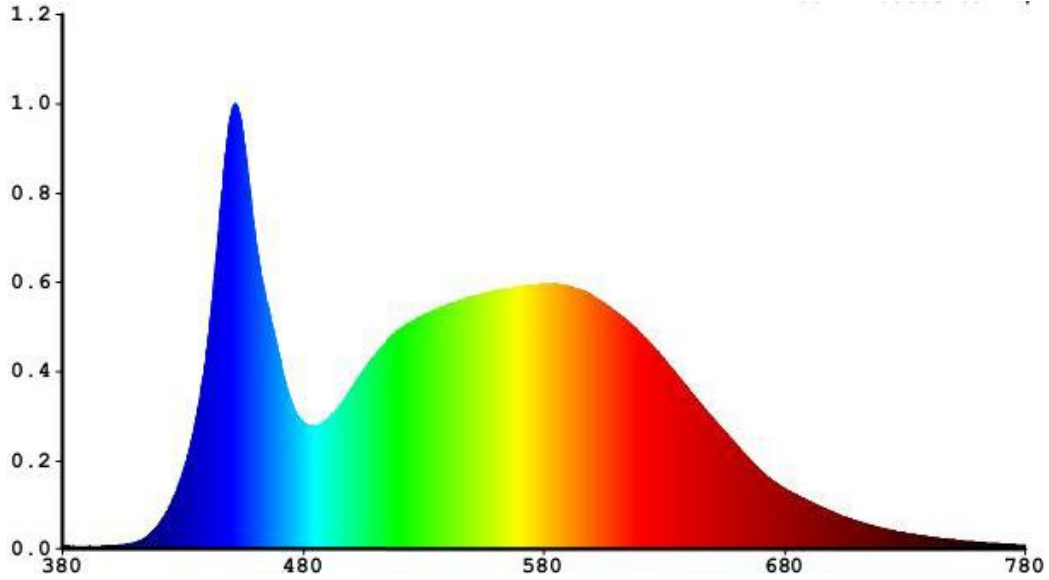
Criteria Item	Result (Sphere)	Result (Goniophotometer)
Total Lumens	-	3218.03 lm
Luminaire Efficacy	-	91.24 lm/W
Correlated Color Temperature (CCT)	5281 K	-
Color Rendering Index (CRI)	85.1	-
R9	20	-
Chromaticity Coordinate (x,y)	x=0.3377 y=0.3456	-
Chromaticity Coordinate (u,v)	u=0.2087 v=0.3204	-
Chromaticity Coordinate (u',v')	u'=0.2087 v'=0.4806	-
Duv	0.00002	-
Spacing Criteria(0-180°)	-	1.20
Spacing Criteria(90-270°)	-	1.30
Zone Lumens between 0-60°	-	74.9 %

3.3 Electrical data on 277V

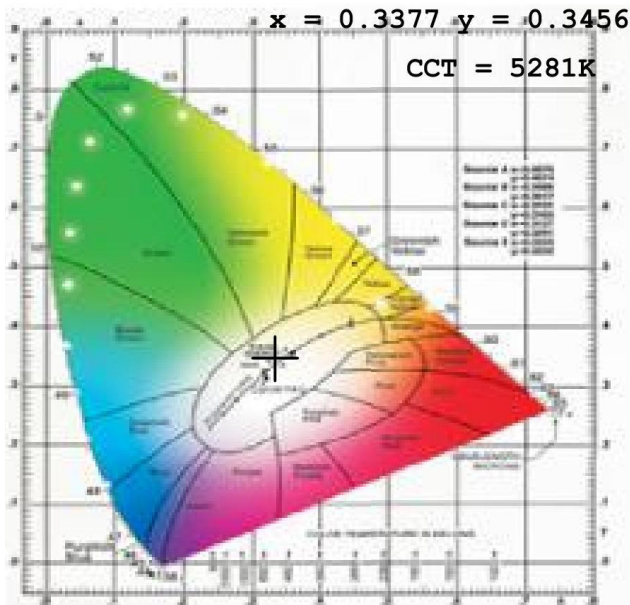
Criteria Item	Result (Sphere)	Result (Goniophotometer)
Input Voltage	277.00V~60Hz	-
Power Factor	0.912	-
I-THD	6.1 %	-
Off-state Power	0.0 W	-

4 Test Data

4.1 Spectral Distribution



4.2 Chromaticity Diagram (CIE 1931)

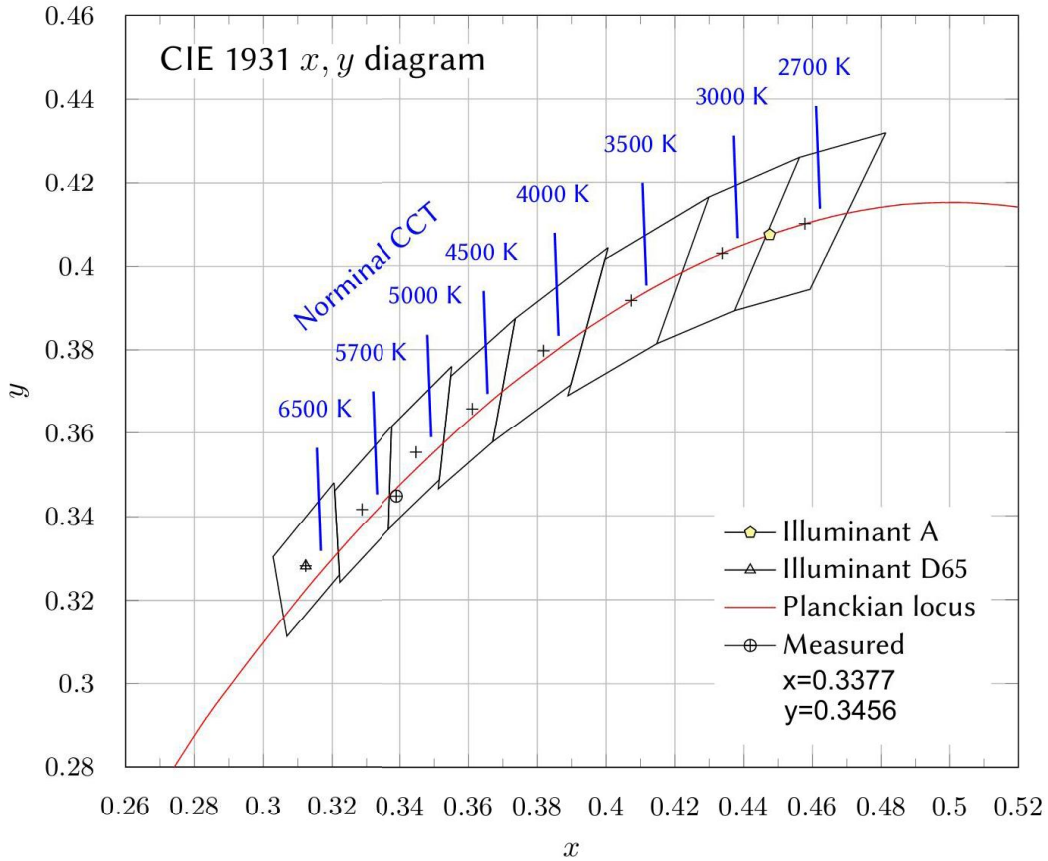




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4.3 ANSI Chromaticity Quadrangles Diagram



4.4 Color Rendering Details

R1	R2	R3	R4	R5
84	90	92	85	85
R6	R7	R8	R9	R10
85	88	72	20	75
R11	R12	R13	R14	R15
84	65	86	96	80



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4.5 Goniometry Test Data

CIE Type	Direct	Basic Luminous Shape	Rectangular
Spacing Criteria(0-180°)	1.20	Luminous Length	0.56 m
Spacing Criteria(90-270°)	1.30	Luminous Width	0.56 m
Test Distance	30.04 m	Luminous Height	0.00 mm

4.6 Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixt
0-30	827.17	25.7	25.7
0-40	1351.45	42	42
0-60	2409.06	74.9	74.9
0-90	3191.02	99.2	99.2
90-120	4.27	.1	.1
90-130	5.35	.2	.2
90-150	12.58	.4	.4
90-180	27.01	.8	.8
0-180	3218.03	100	100

Total Luminaire Efficiency = 100%

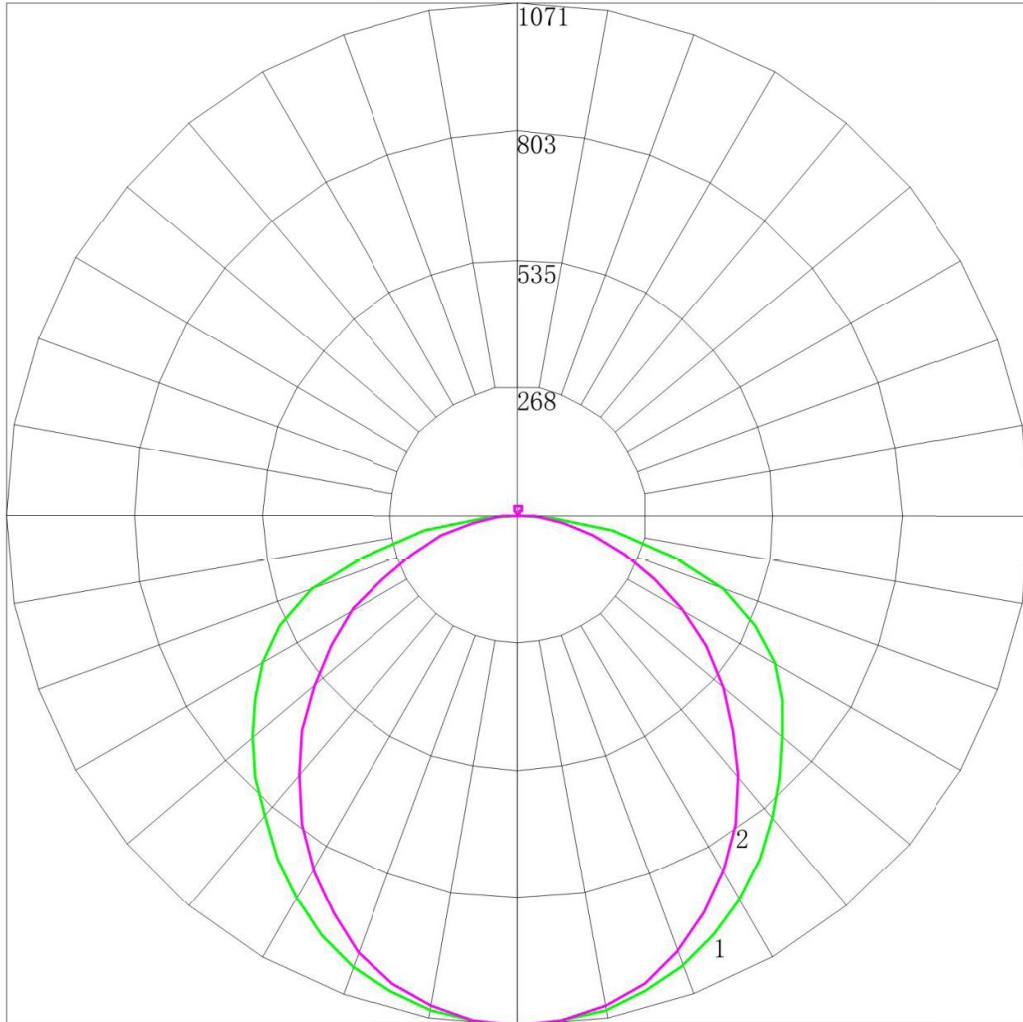
ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	101.23
10-20	289.25
20-30	436.68
30-40	524.28
40-50	545.86
50-60	511.75
60-70	427.51
70-80	275.62
80-90	78.83
90-100	1.74
100-110	1.35
110-120	1.17
120-130	1.09
130-140	1.61
140-150	5.62
150-160	7.02
160-170	5.52
170-180	1.89



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4.7 Polar Curves



Maximum Candela = 1070.79 Located At Horizontal Angle = 0, Vertical Angle = 0
1 - Vertical Plane Through Horizontal Angles (90 - 270)
2 - Vertical Plane Through Horizontal Angles (0 - 180)



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4.8 Candela Tabulation

	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
0	1070.79	1070.79	1070.79	1070.79	1070.79	1070.79	1070.79
5	1065.68	1065.14	1065.1	1065.6	1065.85	1066.27	1067.01
10	1046.67	1046.51	1047.58	1050.28	1052.32	1053.42	1055.64
15	1016.16	1016.53	1019.99	1024.94	1030.65	1033.43	1035.28
20	974.35	975.67	981.96	991.15	999.78	1004.22	1007.91
25	922.12	925.05	934.73	948.14	961.72	969.55	972.67
30	861.02	864.52	878.39	897.12	915.47	927.04	930.65
35	791.91	797.78	815.32	839.10	862.24	876.42	882.29
40	716.38	724.21	744.29	774.52	803.09	822.50	829.48
45	639.40	647.24	671.44	704.86	741.49	766.81	777.07
50	559.07	567.70	593.61	634.17	680.00	712.46	724.98
55	478.87	487.24	516.93	566.54	621.51	660.38	675.94
60	397.40	407.31	440.84	501.83	562.75	603.54	619.22
65	316.49	328.20	370.52	437.07	495.44	535.64	549.96
70	238.82	252.80	302.59	363.22	414.62	447.21	460.20
75	165.82	179.29	229.55	275.89	312.61	331.80	337.95
80	96.35	110.29	145.94	176.58	192.38	199.80	202.12
85	34.35	41.90	59.66	69.27	73.82	74.95	75.37
90	2.08	2.31	3.12	2.96	2.23	1.98	1.80
95	0.95	0.95	1.11	1.33	1.49	1.64	1.89
100	1.04	1.06	1.22	1.31	1.42	1.55	1.71
105	1.04	1.06	1.18	1.31	1.38	1.46	1.62
110	0.95	1.02	1.15	1.22	1.31	1.42	1.39
115	0.91	0.99	1.08	1.13	1.24	1.28	1.35
120	1.00	1.02	1.13	1.22	1.28	1.44	1.35
125	1.04	1.13	1.22	1.24	1.31	1.37	1.39
130	1.00	1.02	1.06	1.15	1.20	1.24	1.26
135	1.00	0.93	0.99	1.06	1.10	1.12	1.08
140	5.16	5.13	5.24	5.35	5.39	5.44	5.26
145	9.23	9.34	9.42	9.67	9.79	9.79	9.44
150	12.04	11.96	11.86	11.88	11.77	11.62	11.19
155	15.52	15.58	15.55	15.56	15.33	15.03	14.52
160	18.87	18.86	18.85	18.93	18.76	18.78	18.61
165	19.51	19.54	19.46	19.63	19.68	19.86	20.09
170	19.55	19.63	19.68	19.83	20.14	20.40	20.54
175	19.46	19.49	19.64	19.74	19.86	19.82	20.05
180	19.66	19.66	19.66	19.66	19.66	19.66	19.66

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