

LM-79-08 Test Report

For

ELEC-TECH INTERNATIONAL CO LTD

No. 1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai City, Guangdong Province, P.R.
China 519085

LED Tube Lamp

Model name(s):

541403##

Representative (Tested) Model:

54140361

Model Difference: ##=61-70 intends CCT=5000K.

Prepare By:

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Engineer: Derek Lai

Date: 2018-06-05

Review By:

Vincent Yuan

Technical Lead: Vincent Yuan

Date: 2018-09-06

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

Product Information:

Client Name:	ELEC-TECH INTERNATIONAL CO LTD
Brand Name:	ETI
Model Number:	541403##(##=61-70)
Product type:	Replacement Lamps ("Plug and Play") (UL type A)
Rating Input:	120-277Vac, 50/60Hz, 20W
Declared CCT:	5000K
Declared Light Output	2200lm
LED Manufacturer:	EVERLIGHT
LED Model:	67-21S
LED Quantity:	96 pcs
Forward current of LED Chip:	150mA
Date of Receipt Samples:	2018-05-21
Quantity of Receipt Samples:	1
Sample Number:	180521007-S1~S2
Test Troffer:	Lithonia 2GT8 lensed 2x4
Test Ballast:	SYLVANIA QTP 2X32WT8/UNV ISN-SC

Laboratory Information:

Test Laboratory:	Dongguan New Testing Centre Co., Ltd
Laboratory Address:	3F, No. 1 the 1 st North Industry Road, Songshan Lake Science & Technology Park, Dongguan, Guangdong, China
Laboratory Contact Name:	Neil Zhong
Laboratory Contact E-mail:	Neil_ntc@163.com

Report Information

Issued Date of Test Report:	2018-09-06
Revised Date of Test Report:	N/A
Test Report No.:	NTCR18060002
Remark (If applicable)	N/A

Test Specifications:	
Date of Test	2018-06-01
Test item	1. Total Luminous Flux 2. Luminous Distribution Intensity 3. Luminous Efficacy 4. Correlated Color Temperature 5. Color Rendering Index 6. Chromaticity Coordinate 7. THD and PF
Reference Standard	IES LM-79-2008 Electrical and Photometric Measurements of Solid-State Lighting Products ANSI C78.377-2008 Specifications for the Chromaticity of Solid State Lighting Products CIE 13.3-1995 Method of Measuring and Specifying Color Rendering Properties of Light Sources CIE 15-2004 Technical Report Colorimetry DLC Technical Requirement V4.2

Test Methods
<p>1. Photometric and Electrical measurements – Light Distribution Method:</p> <p>Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample. The sample was operated at 120 Volts AC, 60Hz. It was stabilized before measurement was made. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 1° vertical intervals and 22.5° Vertical intervals.</p>
<p>2. Photometric and Electrical Measurements – Integrating Sphere Method:</p> <p>Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. 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 120 Volts AC, 60Hz. It was stabilized before measurement was made. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at least 5 nm intervals over the range of 380 to 780 nm.</p>
<p>3. THD and PF measurements</p> <p>The sample was tested according to the ANSI C82.77-2002, the sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.</p>

Integrating Sphere Test Results (Bare Lamp)

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.4 °C	41 %	Face Down	90 min	25 min

Electrical Data:

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.1528	18.30	0.9985

Output Data:

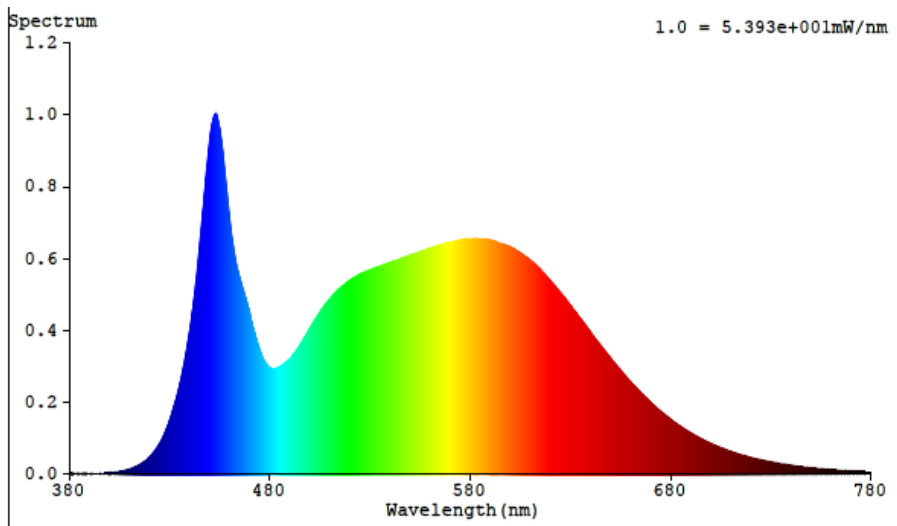
Light Output (lm)	Efficacy (lm/W)
2249.7	122.92

Color Data:

Parameter	Result
CCT (K)	4969
Color Rendering Index (CRI)	84.1
R9	14
Chromaticity, x	0.3468
Chromaticity, y	0.3590
Chromaticity u'	0.2096
Chromaticity v'	0.4884
Duv	0.00305

Special Color Rendering			
R1	82	R9	14
R2	90	R10	75
R3	95	R11	81
R4	82	R12	59
R5	82	R13	84
R6	85	R14	97
R7	88	R15	77
R8	69	-	-

Spectrum Diagram:



Goniophotometer Test Results (Test in Troffer)

Test Condition:

Test Ambient	Test Humidity	Orientation	Stabilization Time	Test Time
25.4 °C	41.0 %	Face Down	90 min	25 min

Electrical Data:

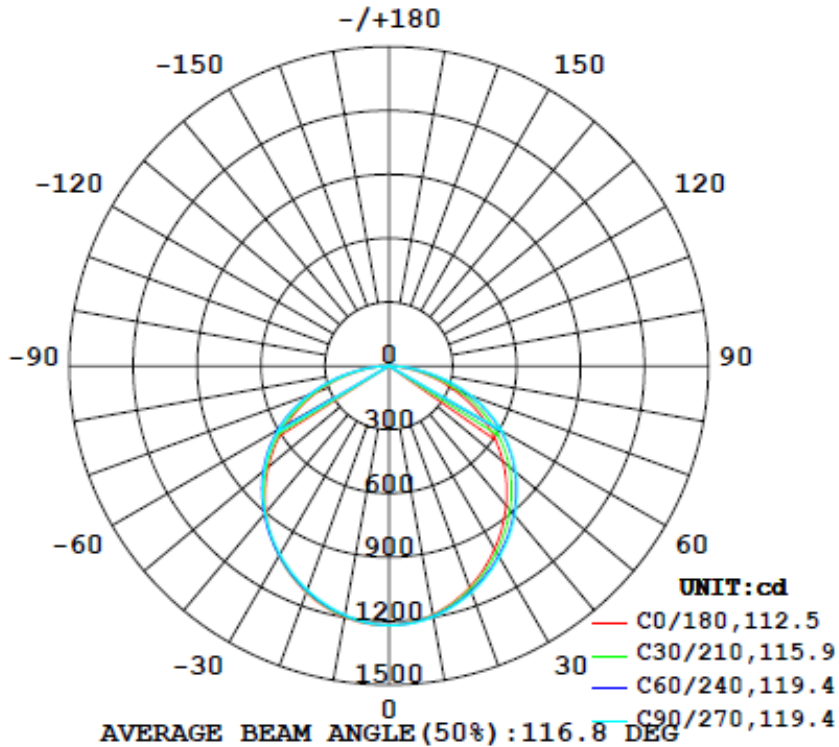
Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.0	60	0.3102	37.07	0.9958

Goniophotometer Data:

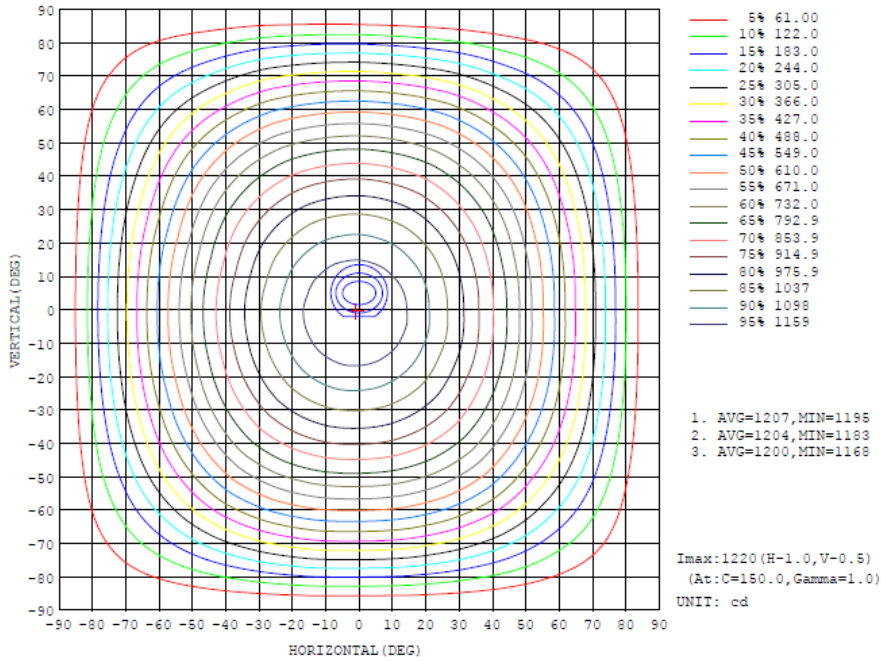
Parameter	Result
Total Luminous (lm)	3627.47
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	97.86
Zonal Lumens Distribution (0-60°)	76.7%
Spacing Criterion (0-180)	1.28
Spacing Criterion (90-270)	1.26
Beam Angle (°)	116.8

Luminous Intensity Distribution Diagram:

LUMINOUS INTENSITY DISTRIBUTION DIAGRAM



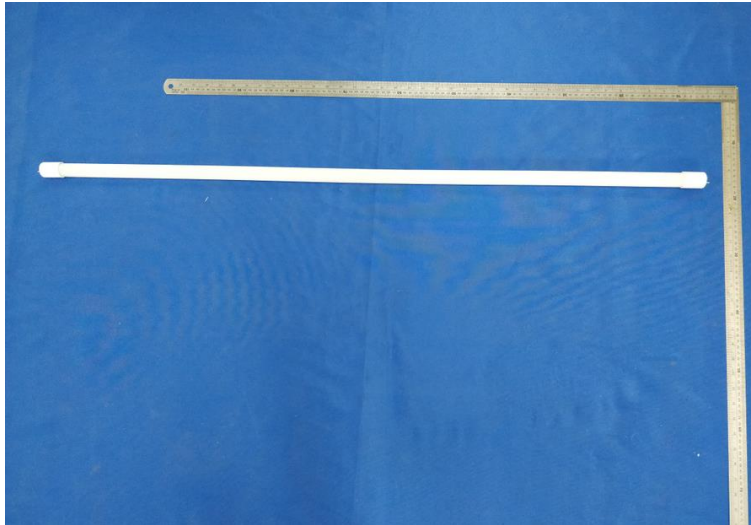
Isocandela Diagram:

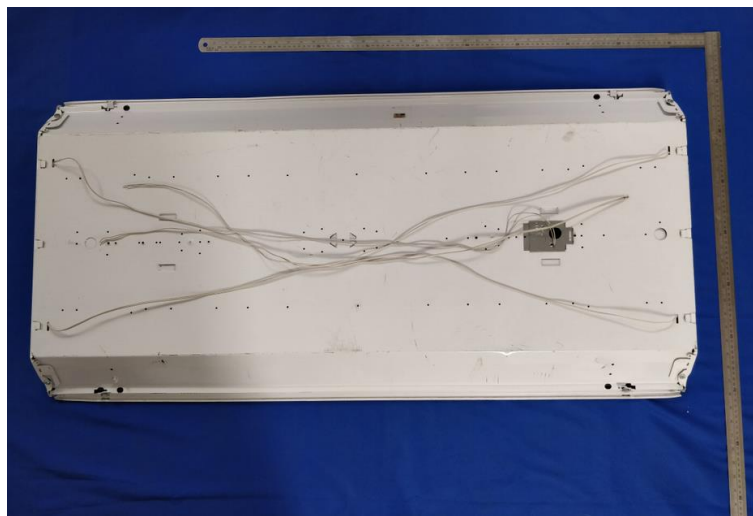
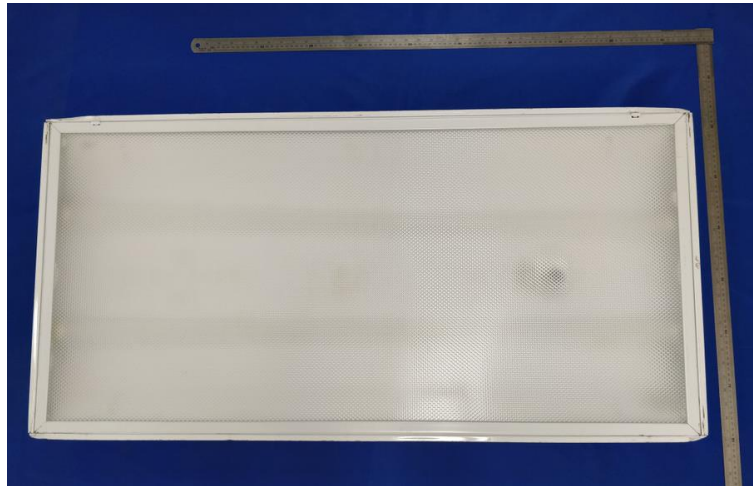


Zonal Flux Diagram:

ZONAL FLUX DIAGRAM:

y	C0	C45	C90	C135	C180	C225	C270	C315	y	◆ zone	◆ total	◆lum.lamp
10	1187	1194	1198	1200	1199	1193	1188	1186	0- 10	115.1	115.1	2.17,2.17
20	1108	1124	1134	1137	1133	1126	1120	1112	10- 20	328.3	443.4	12.2,12.2
30	993.2	1024	1038	1043	1030	1029	1022	1010	20- 30	496.7	940.1	25.9,25.9
40	856.2	903.3	919.2	922.7	897.7	908.1	904.5	886.9	30- 40	603.6	1544	42.6,42.6
50	699.0	761.5	777.3	780.9	729.1	764.1	764.0	743.3	40- 50	639.9	2184	60.2,60.2
60	520.7	591.6	612.4	611.4	559.2	592.4	595.6	568.8	50- 60	599.7	2783	76.7,76.7
70	321.8	385.5	412.6	403.0	357.6	384.8	395.2	359.1	60- 70	477.8	3261	89.9,89.9
80	122.5	162.4	184.5	172.8	149.7	163.3	172.8	139.8	70- 80	283.5	3545	97.7,97.7
90	0.2409	0.7320	5.202	0.5126	3.325	5.172	0.6308	0.4746	80- 90	74.39	3619	99.8,99.8
100	0.5362	1.681	1.197	1.301	0.5658	1.429	1.194	1.658	90-100	0.7879	3620	99.8,99.8
110	0.9098	1.186	2.607	1.146	0.7820	1.425	2.343	1.575	100-110	1.706	3621	99.8,99.8
120	1.072	1.456	1.264	1.549	0.7102	1.298	1.284	1.491	110-120	1.487	3623	99.9,99.9
130	0.7129	1.689	1.353	1.736	0.7638	1.798	1.455	1.691	120-130	1.239	3624	99.9,99.9
140	0.7590	1.754	1.583	1.944	0.8081	1.726	1.584	1.533	130-140	1.141	3625	99.9,99.9
150	0.7815	1.707	1.840	1.868	0.8076	1.791	1.644	1.826	140-150	0.9552	3626	100,100
160	0.7018	1.991	2.021	2.040	0.8165	1.949	1.968	1.577	150-160	0.6956	3627	100,100
170	0.9266	1.132	1.027	0.8861	0.9161	1.218	1.188	1.190	160-170	0.3679	3627	100,100
180	1.010	1.007	0.8719	0.9410	1.010	1.013	0.8834	0.9433	170-180	0.1007	3627	100,100
DEG	LUMINOUS INTENSITY:cd Less than 35% Percent = 14.1 %										UNIT:lm	





Equipment List:

Equipment ID	Equipment Name	Last Cal.	Due Cal.
NTC-F01-001	Goniophotometer System	2017-11-18	2018-11-17
NTC-F01-006	2.0 meter Integrating Sphere	2017-11-18	2018-11-17
NTC-F01-013	Standard Lamp	2017-11-18	2018-11-17
NTC-F01-002	Digital Power Meter	2017-11-18	2018-11-17
NTC-F01-020	Temperature & Humidity Meter	2017-11-23	2018-11-22



NVLAP LAB CODE 600150-0

Report No: NTCR18060002
Report Version: V1.1

*******END OF DATASHEET*******