



# LM-79-08 Test Report

For

## ELEC-TECH INTERNATIONAL CO LTD

No. 1 Jinfeng Road, Tangjiawan Town, Xiangzhou District, Zhuhai City, Guandong 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:

Engineer: Derek Lai

Derele Lai

Date: 2018-06-05

Review By:

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 1st 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





<b>Test Specifications:</b>			
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 Renderin		
	Properties of Light Sources		
	CIE 15-2004 Technical Report Colorimetry		
	DLC Technical Requirement V4.2		

#### **Test Methods**

#### 1. Photometric and Electrical measurements – Light Distribution Method:

Photometric parameters were measured using the goniophotometer and software. The ambient temperature shall be maintained at  $25^{\circ}$  C  $\pm$   $1^{\circ}$  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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  Vertical intervals.

#### 2. Photometric and Electrical Measurements – Integrating Sphere Method:

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at  $25^{\circ}$  C  $\pm$   $1^{\circ}$  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.

## 3. THD and PF measurements

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.





## **Integrating Sphere Test Results (Bare Lamp)**

### **Test Condition:**

<b>Test Ambient</b>	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 Date:**

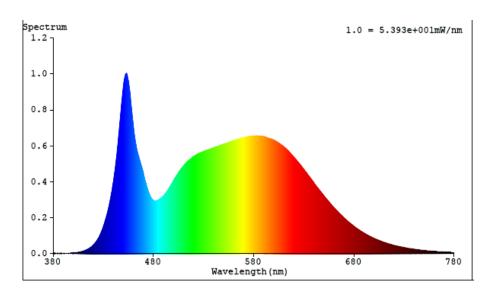
Light Output (lm)	Efficacy (lm/W)
2249.7	122.92

#### **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:**



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## **Goniophotemeter Test Results (Test in Troffer)**

#### **Test Condition:**

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

#### **Electrical Data:**

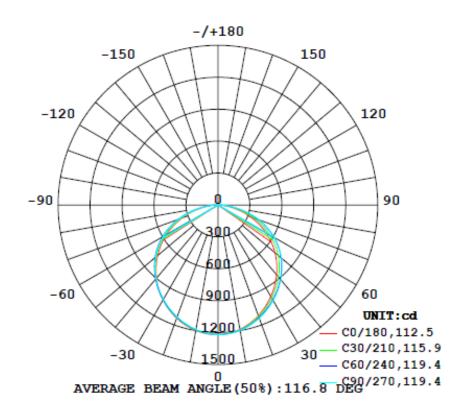
Voltag	ge (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
12	20.0	60	0.3102	37.07	0.9958

#### **Goniophotometer Data:**

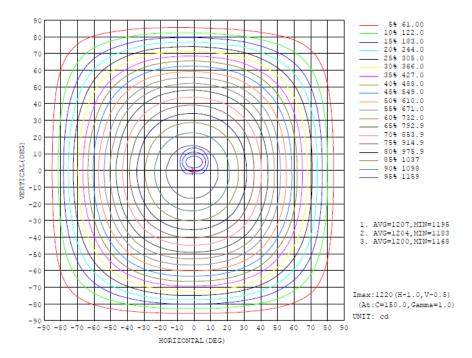
Parameter	Result
Total Luminous (lm)	3627.47
Total Luminous per foot (lm/ft)	N/A
Luminous Efficacy (lm/w)	97.86
Zonal Lumens Distribution (0-60°)	76.7%
Spacing Criterion (0-180)	1.28
Spacing Criterion (90-270)	1.26
Beam Angle (°)	116.8

## **Luminous Intensity Distribution Diagram:**

#### LUMINOUS INTENSITY DISTRIBUTION DIAGRAM







## **Zonal Flux Diagram:**

ZONAL FLUX DIAGRAM:

									1			
Y	C0	C45	C90	C135	C180	C225	C270	C315	γ	• zone	♠ total	%lum, lamp
10	1187	1194	1198	1200	1199	1193	1188	1186	0- 10	115.1	115.1	3.17,3.17
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	902.3	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	739.1	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	285.5	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	0.7330	5.202	0.5126	3.325	5.172	0.6208	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	1.758	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	1.836	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	0.2679	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		LUM	INOUS INTE		UNIT	:lm						

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## **Luminous Distribution Intensity Data:**

Table1																UNI	T: cd		
C (DEG)																			
(DEG)	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270
0	1219	1219	1219	1219	1219	1219	1219	1219	1220	1219	1220	1219	1219	1219	1219	1219	1219	1219	121
5	1210	1211	1212	1213	1214	1214	1215	1216	1216	1216	1216	1216	1215	1213	1213	1212	1211	1210	121
10	1187	1191	1191	1194	1195	1197	1198	1200	1200	1200	1200	1200	1199	1196	1195	1193	1191	1189	118
15	1153	1158	1160	1164	1166	1169	1170	1173	1173	1174	1173	1172	1171	1167	1166	1164	1162	1159	115
20	1108	1114	1117	1124	1127	1132	1134	1137	1137	1137	1136	1134	1133	1128	1128	1126	1125	1121	112
25	1054	1062	1067	1076	1082	1087	1090	1094	1095	1094	1090	1087	1086	1081	1083	1081	1080	1076	107
30	993	1002	1010	1024	1030	1036	1038	1043	1044	1043	1037	1032	1030	1025	1029	1029	1029	1024	102
35	927	938	949	966	974	980	982	986	987	986	977	970	967	962	970	972	973	968	966
40	856	869	884	903	912	917	919	924	925	923	911	900	898	893	904	908	910	907	904
45	780	795	814	835	845	850	851	857	858	854	839	825	821	817	831	839	843	840	838
50	699	717	738	761	773	777	777	783	786	781	762	744	739	736	753	764	771	766	764
55	612	632	655	681	694	698	698	705	707	701	679	658	652	650	670	683	691	686	684
60	521	542	563	592	606	612	612	619	619	611	587	566	559	558	578	592	602	598	596
65	423	445	465	493	509	517	517	523	522	512	488	468	461	460	479	492	505	502	499
70	322	343	359	385	402	412	413	418	415	403	381	364	358	357	373	385	399	398	395
75	220	238	250	273	289	301	302	307	301	287	269	257	253	251	264	272	289	288	286
80	122	137	145	162	174	183	184	188	183	173	160	152	150	149	157	163	177	177	173
85	41.1	51.1	54.6	63.2	70.3	75.2	74.6	77.6	74.2	69.3	66.0	62.3	62.3	60.3	65.8	67.8	74.3	72.9	68.
90	0.24	0.29	4.93	0.73	5.53	1.15	5.20	0.92	5.70	0.51	3.56	1.17	3.33	5.09	3.65	5.17	1.68	6.37	0.6
95	0.20	0.39	0.62	0.49	0.35	0.39	0.41	0.41	0.35	0.50	0.73	0.51	0.49	0.58	1.03	0.63	0.51	0.60	0.5
100	0.54	0.52	1.37	1.68	1.23	1.13	1.20	1.19	1.13	1.30	0.87	0.45	0.57	0.64	1.15	1.43	1.37	1.15	1.1
105	0.79	0.80	0.97	2.28	2.84	2.85	2.72	2.63	2.59	1.53	0.85	0.51	0.70	0.70	1.06	1.27	1.91	2.25	2.3
110	0.91	1.05	1.18	1.19	2.59	2.84	2.61	2.46	2.35	1.15	1.15	0.76	0.78	0.88	1.12	1.43	2.04	2.21	2.3
115	1.00	1.28	1.60	1.20	1.33	1.72	2.08	1.69	1.19	1.25	1.29	0.92	0.74	1.01	1.27	1.19	1.26	1.98	2.6
120	1.07	1.30	1.67	1.46	1.23	1.20	1.26	1.23	1.22	1.55	1.50	0.89	0.71	0.80	1.60	1.30	1.23	1.13	1.2
125	1.04	1.52	1.71	1.68	1.30	1.25	1.27	1.28	1.36	1.79	1.70	1.30	0.83	1.12	1.57	1.65	1.31	1.04	1.2
130	0.71	1.47	1.89	1.69	1.49	1.40	1.35	1.42	1.60	1.74	1.77	1.33	0.76	1.30	1.67	1.76	1.47	1.35	1.4
135	0.81	1.54	1.22	1.83	1.58	1.50	1.52	1.59	1.68	1.91	1.29	1.06	0.81	1.48	1.25	1.75	1.68	1.57	1.6
140	0.76	1.04	1.54	1.75	1.69	1.58	1.58	1.64	1.89	1.94	1.71	1.04	0.81	1.10	1.60	1.73	1.80	1.59	1.5
145	0.74	1.04	1.86	1.40	1.83	1.84	1.85	1.89	1.94	1.48	1.78	0.89	0.77	1.00	1.70	1.36	1.82	1.67	1.7
150	0.78	0.98	1.92	1.71	1.51	1.73	1.84	1.72	1.55	1.87	1.78	0.81	0.81	0.92	1.75	1.79	1.57	1.49	1.6
155	0.78	1.04	1.00	1.65	1.84	1.69	1.63	1.66	2.02	1.98	0.96	0.85	0.86	1.13	1.34	1.93	1.93	1.73	1.6
160	0.70	0.84	0.88	1.99	1.96	1.99	2.02	2.00	2.09	2.04	0.90	0.82	0.82	1.00	1.05	1.95	2.00	1.97	1.9
165	0.83	1.07	1.10	1.03	1.10	2.09	2.10	2.04	1.13	0.96	0.85	0.82	0.85	0.93	1.01	1.12	1.26	1.93	2.0
170	0.93	1.10	1.10	1.13	1.01	1.05	1.04	1.05	0.95	0.89	0.92	0.93	0.92	1.02	1.05	1.22	1.08	1.20	1.1
175	1.01	1.09	1.17	1.16	1.05	1.07	1.05	0.89	0.94	1.10	1.11	1.04	1.00	1.06	1.12	1.15	1.07	1.03	1.1
180	1.01	1.03	1.02	1.01	0.96	0.89	0.87	0.83	0.92	0.94	0.96	0.99	1.01	1.03	1.03	1.01	0.96	0.90	0.8

Table2	_	_	_	_	_	_	_		 			UNI	T: cd	 _
C (DEG)														
(DEG)	285			330			_	_						
0		_	1219	_			_	_						╙
5			1209											
10	1187	1187	1186	1188	1188									
15	1156	1155	1153	1154	1153									
20	1117	1115	1112	1111	1109									
25	1071	1069	1063	1060	1056									
30	1018	1016	1010	1003	996									
35	961	959	951	942	931									
40	900	897	887	875	862									
45	833	829	818	805	787									
50	759	756	743	728	708									
55	678	675	661	644	623									
60	590	586	569	552	532									
65	492	487	468	453	435									
70	387	380	359	346	333									
75	276	267	247	237	229									
80	164	155	140	133	128									
85	62.2	56.1	47.6	46.5	44.3									
90	4.32	0.45	0.47	0.41	0.29									
95	0.61	0.57	0.70	0.59	0.45									
100	1.27	1.34	1.66	1.57	0.64									
105	2.75	2.56	2.67	1.24	0.97									
110	3.05	3.36	1.57	1.34	1.19									
115	2.59	1.34	1.40	1.65	1.28									
120	1.25	1.30	1.49	1.72	1.42									
125	1.29	1.37	1.65	1.79	1.49									
130	1.52	1.56	1.69	1.54	1.44									
135	1.61	1.59	1.81	1.36	1.08									
140	1.65	1.81	1.53	1.64	1.05									
145	1.79	1.73	1.48	1.80	1.07									
150	1.55	1.59	1.84	1.84	1.19									
155	1.90	1.94	1.69	1.14	1.10									
160	1.99	2.00	1.58	0.99	0.94									
165	2.00	1.21	1.14	1.22	1.10									
170	1.20	1.10	1.19	1.15	1.01									
175	1.15	1.04	1.11	1.04	1.02									
180	0.84	0.92	0.94	0.96	0.99									$\vdash$

## **THD and PF Measurement Test Result:**

### **Electrical Measurement:**

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	iTHD
277.0	60	0.1402	37.81	0.9735	7.24

Tel: 86-755-2344 3526 Website: http://www.ntc-cert.com



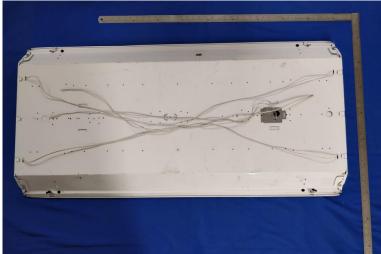
















**Equipment List:** 

<b>Equipment ID</b>	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





# \*\*\*\*\*END OF DATASHEET\*\*\*\*