

Test report of

IES LM-79-08

Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

Rendered to:

Foshan Topday Optoelectronics Technology Co., Ltd
Huansheng Heng Road, Guicheng Eastern Industrial Zone B,
Sanshan Nanhai District, FOSHAN Guangdong 528200

For products:

LED Fixed Luminaire

Models No.:

WAL-191,BL-CM360W1400

Test Date: Aug. 25, 2022 to Aug. 29, 2022

Test Lab.: **LCTECH Guangdong Testing Services Co., Ltd.**

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Xiaolan, Zhongshan, Guangdong, China

Template No.: LC-RT-PL-001 Rev.2.0

Test Note: *Two model are the same except the model number, WAL-191 was selected to the test.*

Complied by:

Pengkang Liang

Aug. 31, 2022

Reviewed by:

Lin Qiu

Aug. 31, 2022

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1. General

1.1 Product Information

Brand Name	 <p>TD, Topday, 千里目, brightline!</p>
Product Type	LED Fixed Luminaire
Model Number	WAL-191,BL-CM360W1400
Rated Inputs	120-277VAC,50/60Hz
Rated Power	45W
Rated Light output	2200lm
Declared CCT	2700-6500K
Power Supply	TD0504IL-E090
LED Package, Array or Module	-
Receipt Samples	1 unit
Sample Code of lab.	220822106001
Date of Receipt Samples	Aug. 22, 2022
Note	This product is a color tunable luminaire, 2700K, 3000K, 3500K, 4000K, 5000K, 6500K settings are selected for test.



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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 or 2015 or 2017	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

Instrument	ID	Model name	Cal. date	Next cal. Date
AC Power supply	LC-I-987	APW-120N	2021-12-16	2022-12-15
AC Power supply	LC-I-989	APW-120N	2021-12-16	2022-12-15
Power analyzer	LC-I-PL-024	WT310E	2022-03-01	2023-02-28
Power analyzer	LC-I-954	WT210	2021-12-20	2022-12-19
Multimeter	LC-I-972	Fluke	2022-07-01	2023-06-30
Photometric colorimetric electric system ¹ (2 meter sphere)	LC-I-956	HAAS-2000	Before use	Before use
Standard lamp ²	LC-I-PL-030	D204C	2022-07-07	2023-07-06
Luminous Flux Lamp ³	LC-I-PL-031	AC 220V/200W	2022-07-11	2023-07-10
Goniophotometer(with mirror)	LC-I-902	GMS2000	2022-04-21	2023-04-20
Wireless temperature and humidity transmitter	LC-I-PL-009	DWLR-DLR	2021-12-16	2022-12-15
Wireless temperature and humidity transmitter	LC-I-PL-008	DWLR-DLR	2021-12-16	2022-12-15

Note:

1, Bandwidth of spectroradiometer is 1 nm.

2, halogen lamp, 100W, omni-directional type, and its traceability to NIM.

3, halogen lamp, 200W, omni-directional type, and its traceability to NIM.

2. Test conducted and method

The lamp/luminaire was operated at least 2 hours to reach stabilization and temperature equilibrium before test.

2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at $25\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$; 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 type C goniophotometer 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.



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3. Test Result Summary

3.1 Electrical data

Criteria Item	2700K	3000K	3500K	4000K	5000K	6500K
Input Voltage & Frequency	120.00V ~60Hz	119.98V ~60Hz	119.98V ~60Hz	119.96V ~60Hz	120.01V ~60Hz	120.00V ~60Hz
Input Current(A)	0.397	0.397	0.397	0.397	0.396	0.396
Total Power(W)	47.53	47.53	47.51	47.49	47.48	47.43
Power Factor	0.998	0.998	0.998	0.998	0.998	0.998
Off-state Power(W)	-	-	-	-	-	-

3.2 Photometric data

Criteria Item	2700K	3000K	3500K	4000K	5000K	6500K
Total Lumens(lm)	3159.52	3266.47	3423.59	3471.42	3523.16	3467.42
Luminaire Efficacy(lm/W)	66.47	68.72	72.06	73.10	74.20	73.11
Correlated Color Temperature (CCT)(K)	2842	3090	3654	3925	5227	6412
Color Rendering Index (CRI)	97.1	95.9	94.1	93.9	93.3	93.4
R9	97	90	79	78	78	89
Chromaticity Coordinate (x,y)	0.4442 0.3992	0.4245 0.3886	0.3918 0.3710	0.3801 0.3658	0.3388 0.3420	0.3145 0.3286
Chromaticity Coordinate (u,v)	0.2574 0.3470	0.2492 0.3422	0.2350 0.3338	0.2293 0.3311	0.2109 0.3193	0.1992 0.3123
Chromaticity Coordinate (u',v')	0.2574 0.5205	0.2492 0.5133	0.2350 0.5007	0.2293 0.4966	0.2109 0.4790	0.1992 0.4684
Duv	-0.0028	-0.0045	-0.0058	-0.0051	-0.0023	0.0021
Zone Lumens between 0-60°	66.50°	-	-	-	-	-
Beam Angle(50%Imax)	C0/180 =129.6° C90/270 =95.8°	-	-	-	-	-

3.3 Color Rendering Details

2700K

R1	R2	R3	R4	R5	R6	R7	R8
96	98	97	96	97	96	99	99
R9	R10	R11	R12	R13	R14	R15	-
97	98	93	90	96	97	97	-



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3000K



R1	R2	R3	R4	R5	R6	R7	R8
94	96	98	96	95	93	99	96
R9	R10	R11	R12	R13	R14	R15	-
90	93	93	86	94	98	94	-

3500K

R1	R2	R3	R4	R5	R6	R7	R8
92	94	99	95	93	91	97	92
R9	R10	R11	R12	R13	R14	R15	-
79	89	93	80	92	99	90	-

4000K

R1	R2	R3	R4	R5	R6	R7	R8
92	94	98	95	93	92	95	92
R9	R10	R11	R12	R13	R14	R15	-
78	88	95	78	92	99	90	-

5000K

R1	R2	R3	R4	R5	R6	R7	R8
92	93	97	94	93	91	93	92
R9	R10	R11	R12	R13	R14	R15	-
78	87	96	77	92	99	90	-

6500K

R1	R2	R3	R4	R5	R6	R7	R8
95	95	95	91	94	94	91	92
R9	R10	R11	R12	R13	R14	R15	-
89	90	96	72	95	98	92	-

Note: N/A



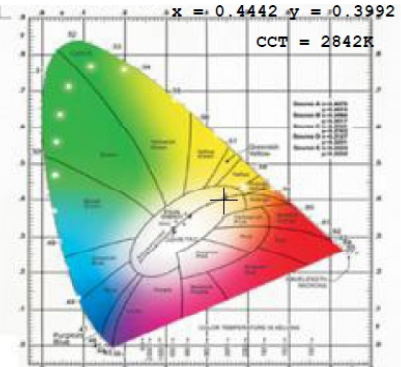
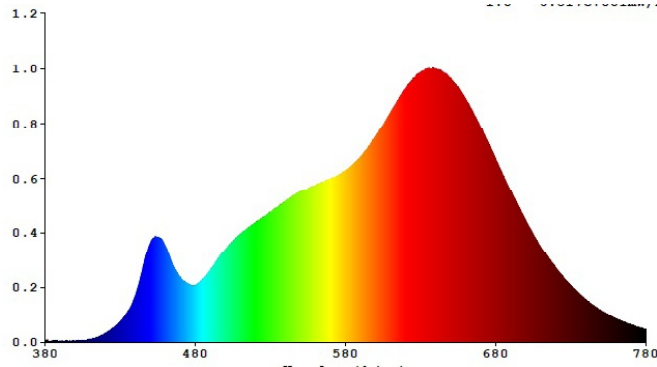
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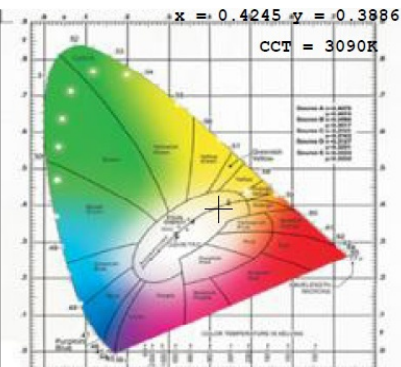
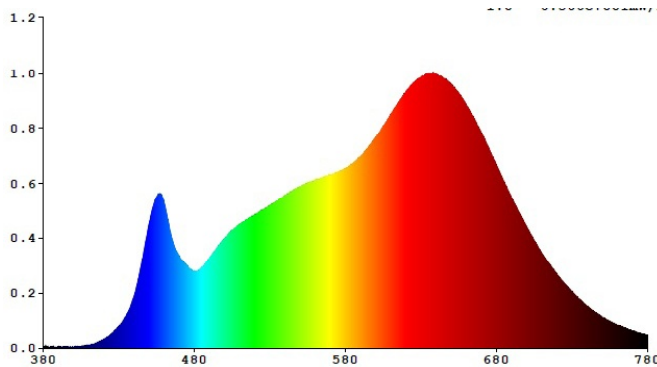
4. Test Data

4.1 Spectral Distribution

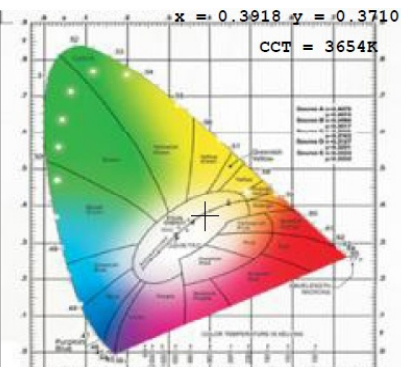
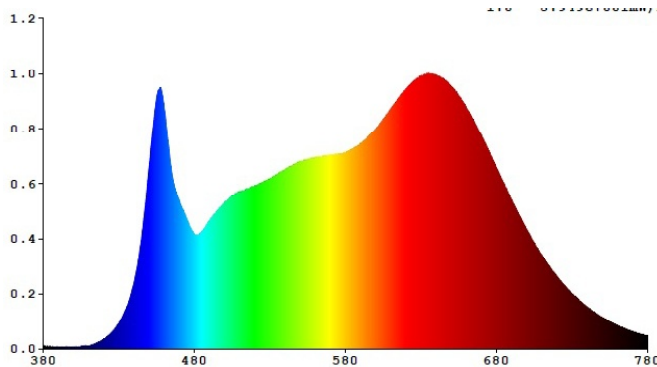
2700K



3000K

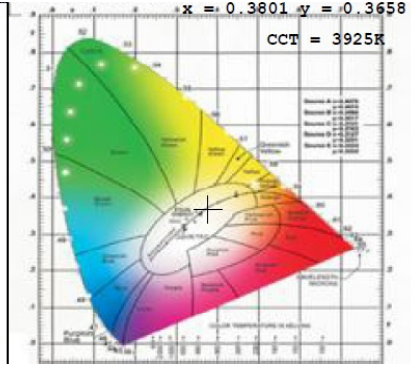
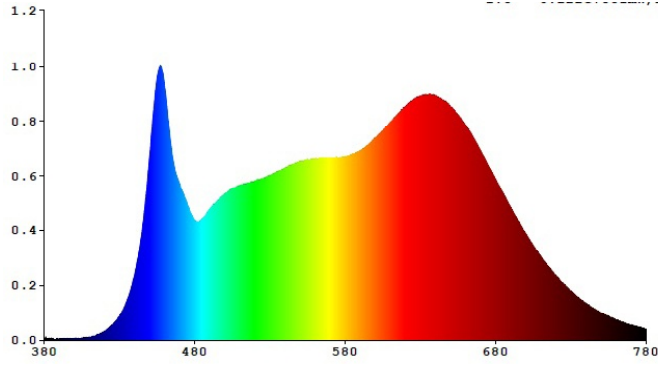


3500K

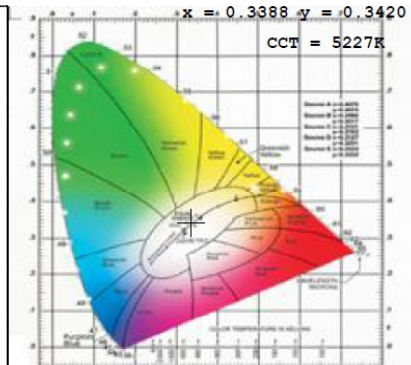
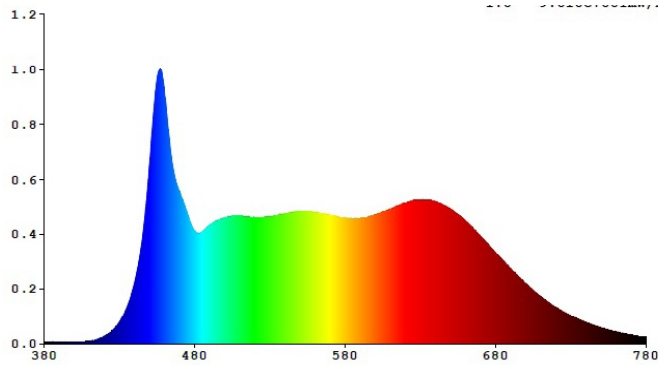




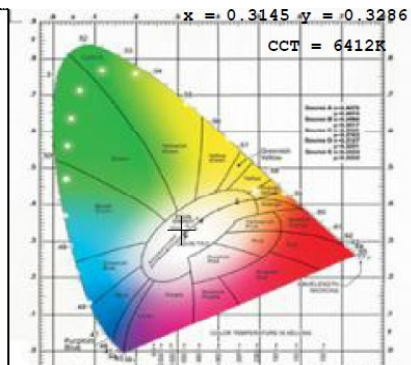
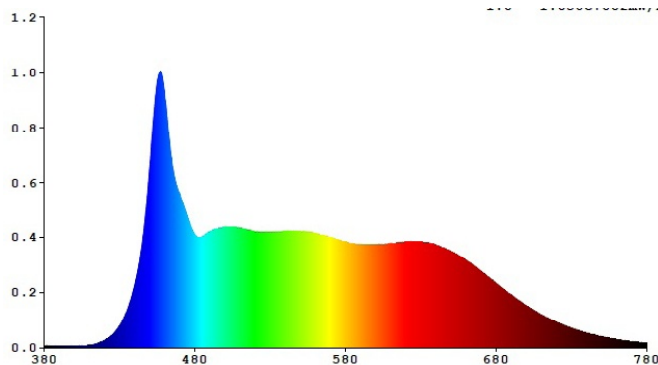
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4000K



5000K

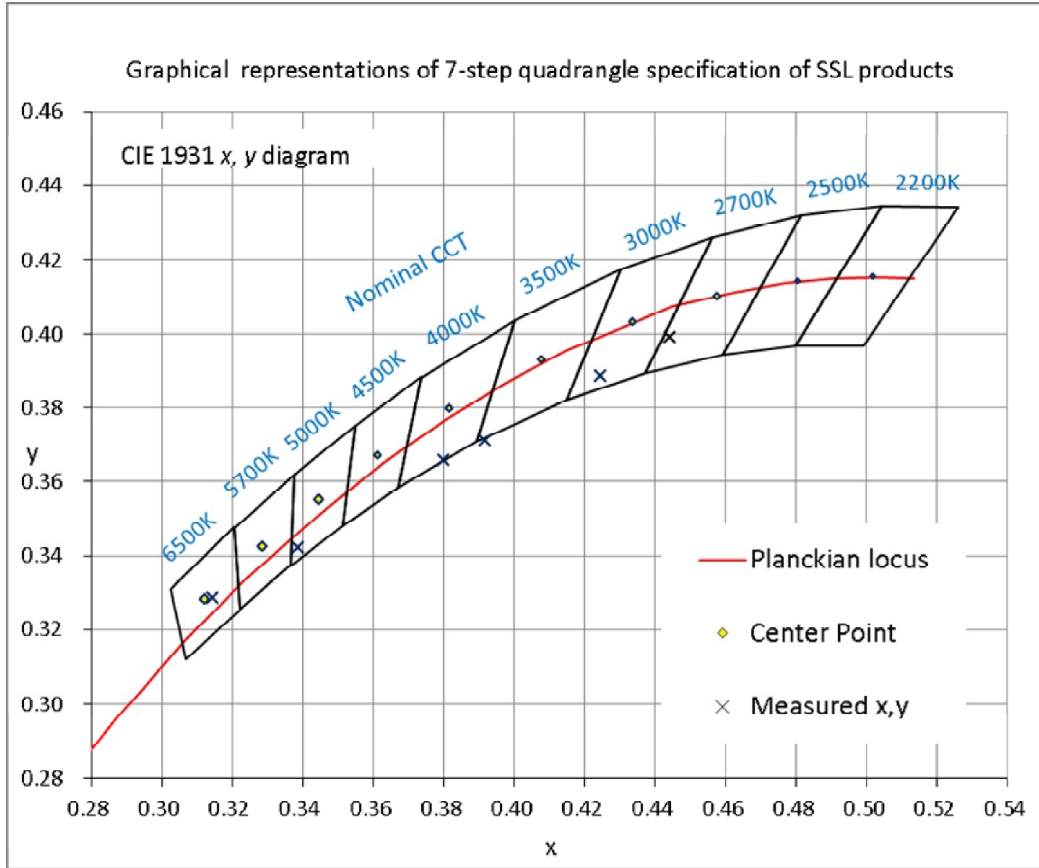


6500K





4.2 ANSI Chromaticity Quadrangles Diagram





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4.3 Goniometry Test Data

2700K

CIE Type	Direct	Basic Luminous Shape	Rectangular w/Sides
Spacing Criteria (0-180)	1.18	Luminous Length	0.87 m
Spacing Criteria (90-270)	1.42	Luminous Width	0.08 m
Spacing Criteria (Diagonal)	1.44	Luminous Height	0.05 m
Test Distance	29.75 m		

4.4 Zonal Lumen Summary

2700K

Zone	Lumens	%Lamp	%Fixt
0-20	333.97	10.60	10.60
0-30	716.62	22.70	22.70
0-40	1183.19	37.40	37.40
0-60	2101.02	66.50	66.50
0-80	2702.71	85.50	85.50
0-90	2861.16	90.60	90.60
10-90	2775.43	87.80	87.80
20-40	849.21	26.90	26.90
20-50	1332.14	42.20	42.20
40-70	1267.23	40.10	40.10
60-80	601.69	19.00	19.00
70-80	252.29	8.00	8.00
80-90	158.45	5.00	5.00
90-110	154.62	4.90	4.90
90-120	190.40	6.00	6.00
90-130	221.30	7.00	7.00
90-150	269.86	8.50	8.50
90-180	298.36	9.40	9.40
110-180	143.74	4.50	4.50
0-180	3159.52	100.00	100.00

Total Luminaire Efficiency = 100.00%

ZONAL LUMEN SUMMARY

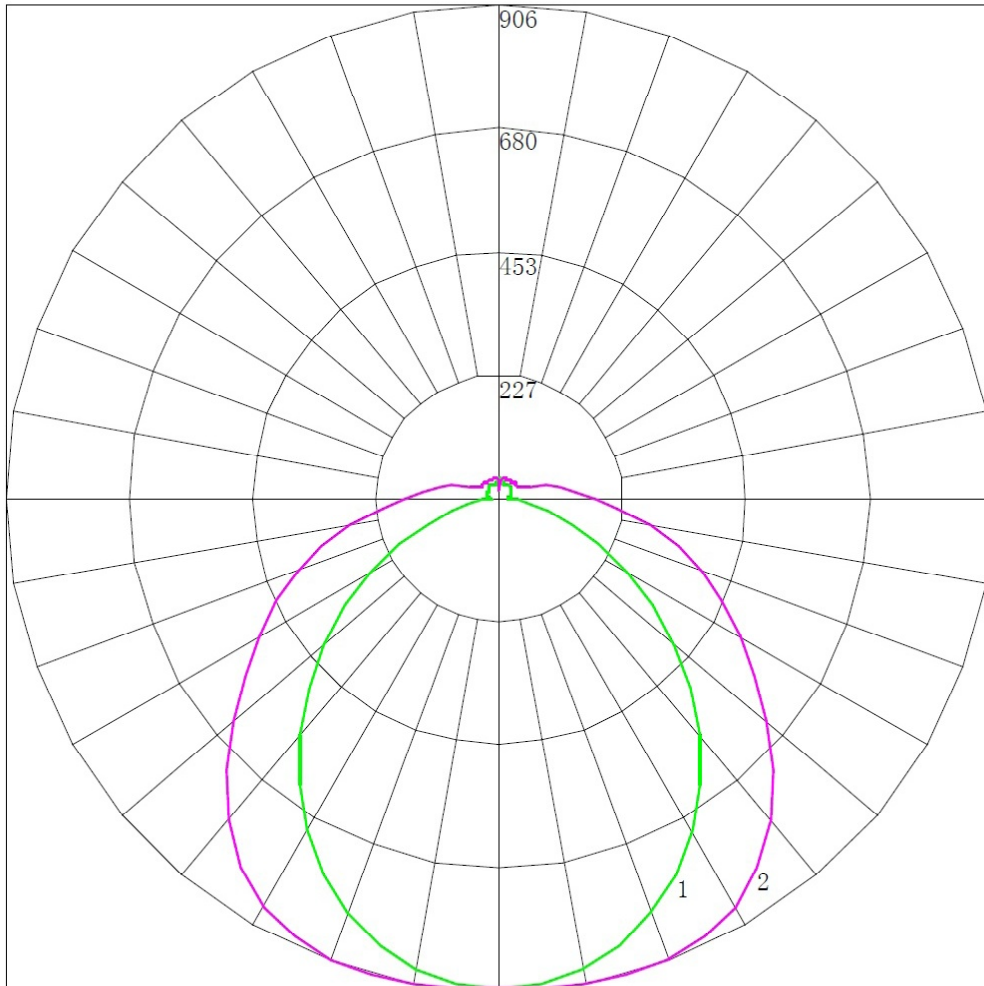
Zone	Lumens
0-10	85.73
10-20	248.24
20-30	382.65
30-40	466.56
40-50	482.92
50-60	434.91
60-70	349.40
70-80	252.29
80-90	158.45
90-100	97.18
100-110	57.44
110-120	35.78
120-130	30.90
130-140	26.82
140-150	21.74
150-160	15.95
160-170	9.46
170-180	3.10



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4.5 Polar Curves

2700K



Maximum Candela = 906.329 Located At Horizontal Angle = 90, Vertical Angle = 15
1 - Vertical Plane Through Horizontal Angles (0 - 180)
2 - Vertical Plane Through Horizontal Angles (90 - 270)



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4.6 Candela Tabulation

2700K

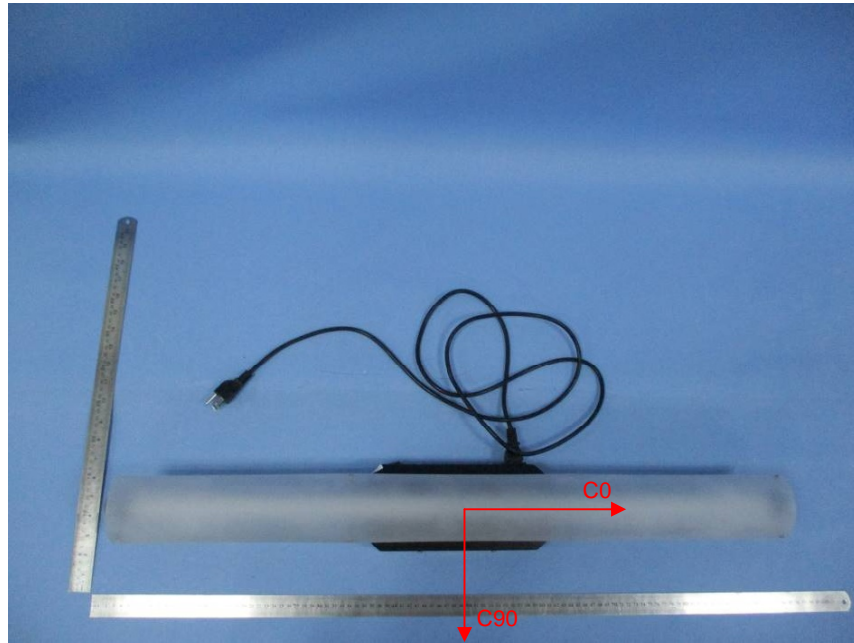


	<u>0</u>	<u>15</u>	<u>30</u>	<u>45</u>	<u>60</u>	<u>75</u>	<u>90</u>
0	903.280	903.280	903.280	903.280	903.280	903.280	903.280
5	897.925	898.373	899.286	900.623	901.516	903.941	904.151
10	880.519	882.538	886.849	893.093	898.420	903.058	905.893
15	853.296	856.666	865.531	879.140	891.126	900.417	906.329
20	814.023	820.311	836.886	859.870	879.197	894.260	902.844
25	764.039	776.151	800.690	833.293	862.408	881.289	891.521
30	707.361	722.623	757.387	800.513	840.113	856.014	868.438
35	642.650	662.403	707.200	759.537	797.034	817.774	827.934
40	571.244	596.385	651.688	708.371	746.457	765.027	774.364
45	496.268	527.691	590.848	654.756	684.175	702.832	709.036
50	420.400	456.097	523.120	579.458	613.510	633.391	637.174
55	344.978	383.835	453.174	506.361	543.507	566.801	569.667
60	270.895	311.350	388.365	433.264	476.597	504.171	508.258
65	201.274	242.878	307.960	367.695	417.187	444.164	450.769
70	141.919	179.092	243.793	309.664	359.751	387.012	395.893
75	92.827	128.913	190.282	256.508	304.530	330.089	338.839
80	57.124	81.182	145.863	208.224	251.975	274.497	279.607
85	33.471	50.180	106.127	160.587	196.352	216.050	215.150
90	14.727	35.684	79.909	121.843	150.587	166.130	176.823
95	16.959	27.209	61.954	102.773	123.672	132.294	139.368
100	22.314	22.302	45.286	81.074	103.367	115.176	112.801
105	22.761	24.533	32.194	50.064	69.337	82.850	89.718
110	22.761	26.094	31.749	38.321	46.153	53.401	57.054
115	23.653	26.764	32.860	35.885	39.530	42.636	43.988
120	24.099	27.210	33.082	36.328	37.764	39.340	40.068
125	24.546	28.548	32.860	36.549	38.207	38.680	38.762
130	25.438	29.217	32.418	36.106	38.427	39.119	39.633
135	27.223	30.332	32.640	35.220	37.544	39.120	39.197
140	29.008	31.224	32.640	34.776	36.660	38.021	38.762
145	29.901	32.116	33.084	34.998	36.440	37.142	37.891
150	29.901	32.562	34.194	34.776	36.220	36.923	37.020
155	27.670	31.002	35.085	36.105	36.662	36.483	37.020
160	25.438	28.995	32.868	35.438	37.103	37.143	37.020
165	25.885	29.217	31.755	32.558	35.343	37.362	37.455
170	31.240	33.009	33.304	32.783	32.472	35.829	37.891
175	37.042	36.800	36.635	36.108	33.784	32.530	34.407
180	17.553	17.553	17.553	17.553	17.553	17.553	17.553

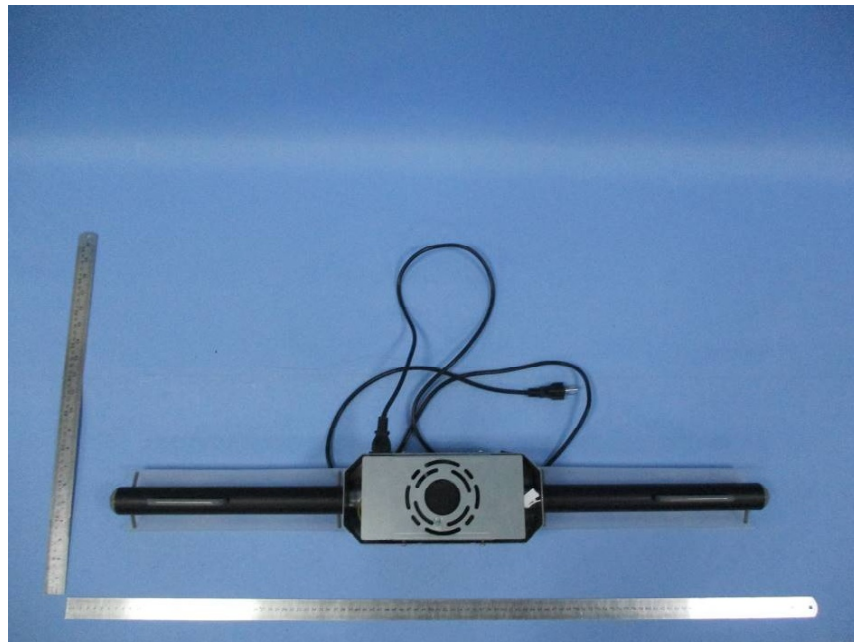


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Appendix A Product Photo



Picture 1



Picture 2

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