



IES LM-79-08

MEASUREMENT AND TEST REPORT

For

SHENZHEN TUBU TECH CO.,LTD

Building C, Hankun Hi-tech Industrial Zone, Longteng Road, Gaoqiao District, Pingdi, Longgang, Shenzhen, Guangdong, China.

Test Model: LBF5F-80W(4000K)

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution, THD
Test Engineer:	Carl Du <i>Carl Du</i>
Report Number:	RSZ170314519-10
Test Date:	2017-03-17 to 2017-03-27
Report Date:	2017-05-04
Reviewed By:	Blake Zhang / EE Engineer <i>Blake Zhang</i>
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Accreditation:	The IAS Accreditation Number TL-460.

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan). This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

1. Product Description

General Information:

One sample was received on 2017-03-14 and used for testing.

Model Tested:	LBF5F-80W(4000K)
Manufacturer:	SHENZHEN TUBU TECH CO.,LTD
Brand Name:	TUBU
Product Designation:	High-bay Luminaires for Commercial and Industrial Buildings
Burning Time Before Test:	0hour(For New Products)

Rated Values:

Rated Voltage/Frequency:	AC 100-277V 50/60Hz
Rated Power:	80 W
Nominal CCT:	4000K
Nominal Lumen Output:	10400 lm

2. Standards Used

- IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits – Related Power Quality Requirements for Lighting
- IES TM-30-15: IES Method for Evaluating Light Source Color Rendition (This method is not in IAS accreditation scope)

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
2.0m integrating sphere	EVERFINE	R98	11010018	R98	2016-11-18	2017-11-17
spectroradiometer	EVERFINE	HAAS-2000	20140912	380-780nm	2016-11-18	2017-11-17
Digital Power Meter	EVERFINE	PF2010A	1011004	600V/20A	2016-07-11	2017-07-10
Digital CC&CV DC Power Supply	EVERFINE	WY305-V1	1101047	30V/5A	2016-07-07	2017-07-06
Rapid recording photometer	EVERFINE	PHOTO-2000F	1007010	0.1lm—200klm	2016-12-30	2017-12-29
Standard Light Source	SENSING	N/A	LSD090808	N/A	2016-12-05	2017-12-04
Special zero-voltage synchronous switching AC	EVERFINE	DPS1010-YF	1011001T	0-150V, 0-300V	2017-03-03	2018-03-02
AC Power Supply	EVERFINE	VPS1030 PWM	1012017	0-150V, 0-300V	2017-03-03	2018-03-02
DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2017-03-03	2018-03-02
Power Meter	YOKOGAWA	WT-210	91KB35700	15/30/60/150/300/600 V	2017-03-03	2018-03-02
Goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	1600mm, 3000W/10A	2017-03-09	2018-03-08
Wireless Remote Sensor	N/A	433MHz	N/A	0°C~50°C; -20°C~60°C	2017-03-20	2018-03-19

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Standard Light Source	EVERFINE	D908	1012003	N/A	2016-12-17	2017-12-17

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attested that all calibration has been performed using suitable standards traceable to National Primary Standards and International System of Units (SI).

4. Test Method

Product was tested with no seasoning. All stabilization and measurements were made in compliance with IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$ during measurement. And relative humidity is less than 65%.

Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, Spectroradiometer, and integrating sphere. The integrating sphere system is calibrated by standard spectrum light source before measurement.

4π geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

The uncertainty of the light output (luminous flux) measurements is $U=1.8\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=20\text{K}$ ($K=2$), at the 95% confidence level. The uncertainty of the CRI is $U=1.8(K=2)$, at the 95% confidence level.

The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.15\%$ of rdg, Power $U=0.20\%$ ($K=2$), at the 95% confidence level.

Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The vertical angle (γ) test intervals were set no more than 1 degree while data for 5 degree intervals is reported. The horizontal angle (C plane) test intervals were set no more than 22.5 degree.

The uncertainty of the luminous intensity is $U=1.6\%$ ($K=2$) , at the 95% confidence level.

Additional Test

The Additional Test item may not be covered by IESNA LM-79-2008. Additional test including power factor, off-state power and THD, was measured by Digital Power Meter after stabilized at $25^{\circ}\text{C}\pm 1^{\circ}\text{C}$. Test voltage for THD and power factor test would be equal to rated voltage or, in case of a voltage range, maximum value of that range.

The uncertainty of power meter AC current $U=0.19\%$ of rdg, AC Voltage $U=0.15\%$ of rdg, Power $U=0.20\%$ ($K=2$), at the 95% confidence level.

Fidelity Index and Gamut Index Calculation

The R_f , R_g was calculated according to IES TM-30-15 by using calculation tools. The calculation was based on the measured SPD from 380nm to 780nm with 1nm intervals. All the colors in this report is for reference only.

5. Test Result

[Integrating Sphere System]

Total operating time for integrating sphere test: **1.0 hour**

Test orientation: **Downward**

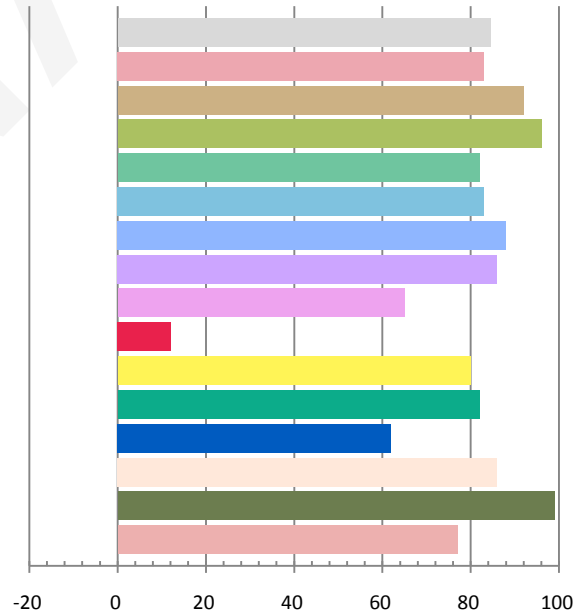
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.6694	79.99	0.9958	10010	125.13

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
30.564	4132	0.00194	0.3760	0.3781	0.2217	0.5015

Color Rendering Index

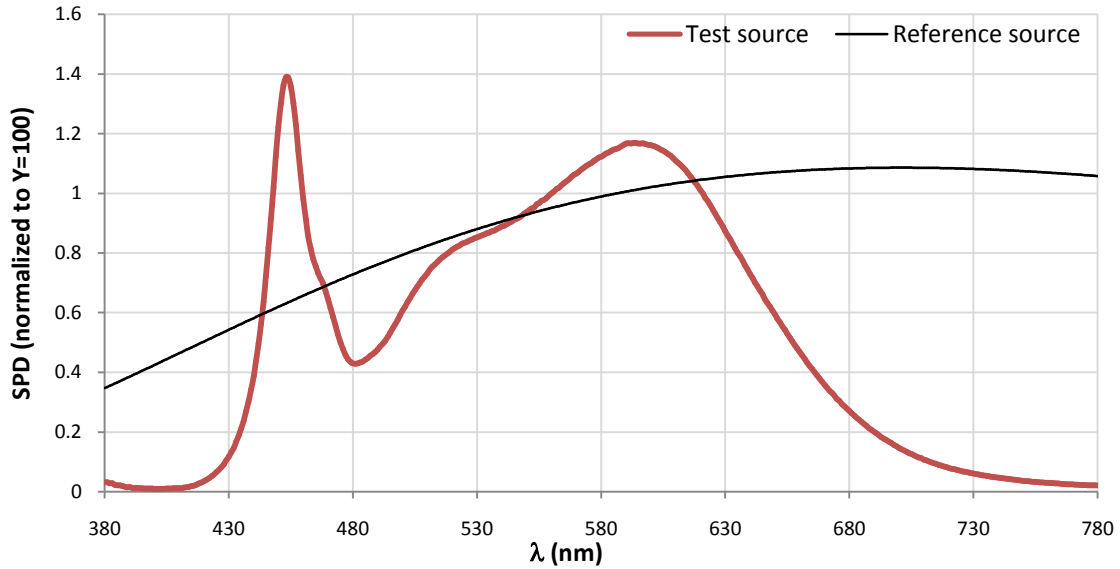
Ra			
84.5			
R1	R2	R3	R4
83	92	96	82
R5	R6	R7	R8
83	88	86	65
R9	R10	R11	R12
12	80	82	62
R13	R14	R15	
86	99	77	



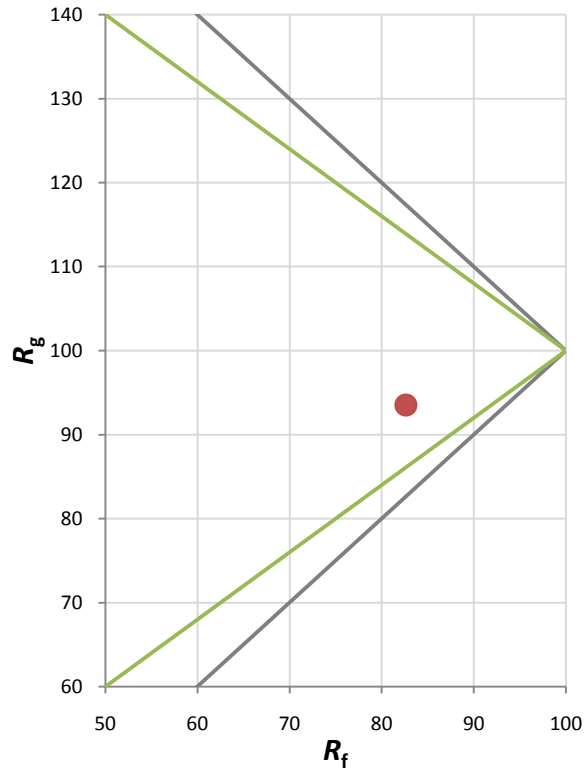
Fidelity Index and Gamut Index

Fidelity Index R_f	83
Gamut Index R_g	94

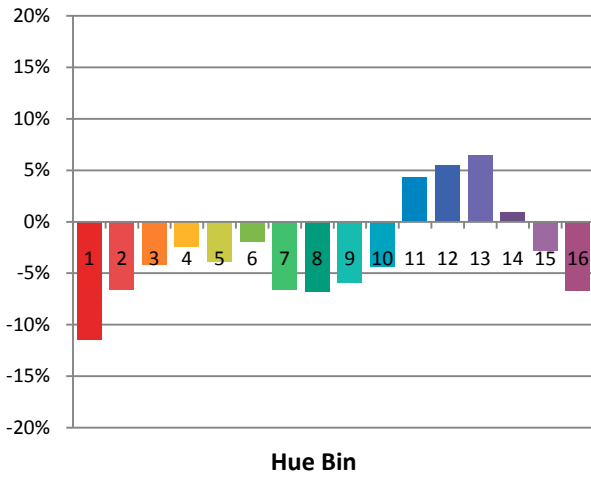
Spectral Power Distribution Comparison



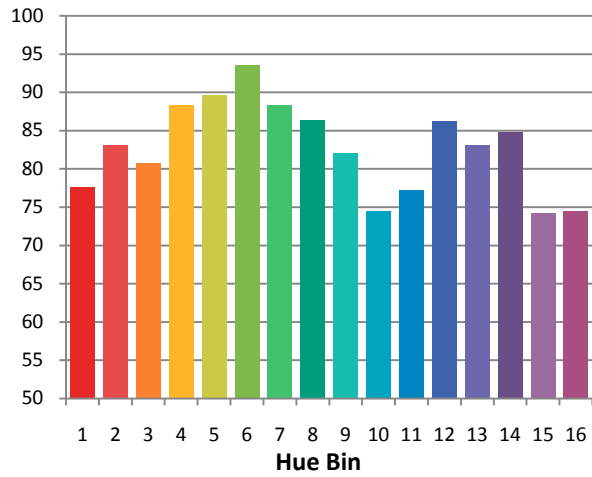
Plot of R_g versus R_f



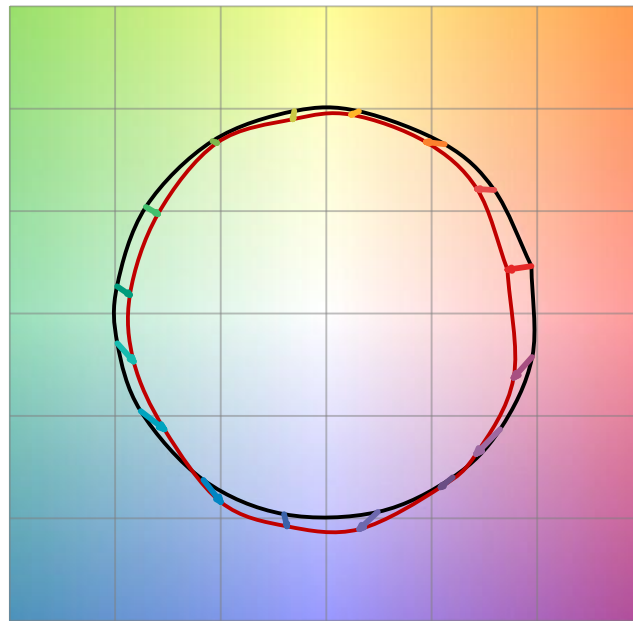
Chroma Shift by Hue



R_f by Hue

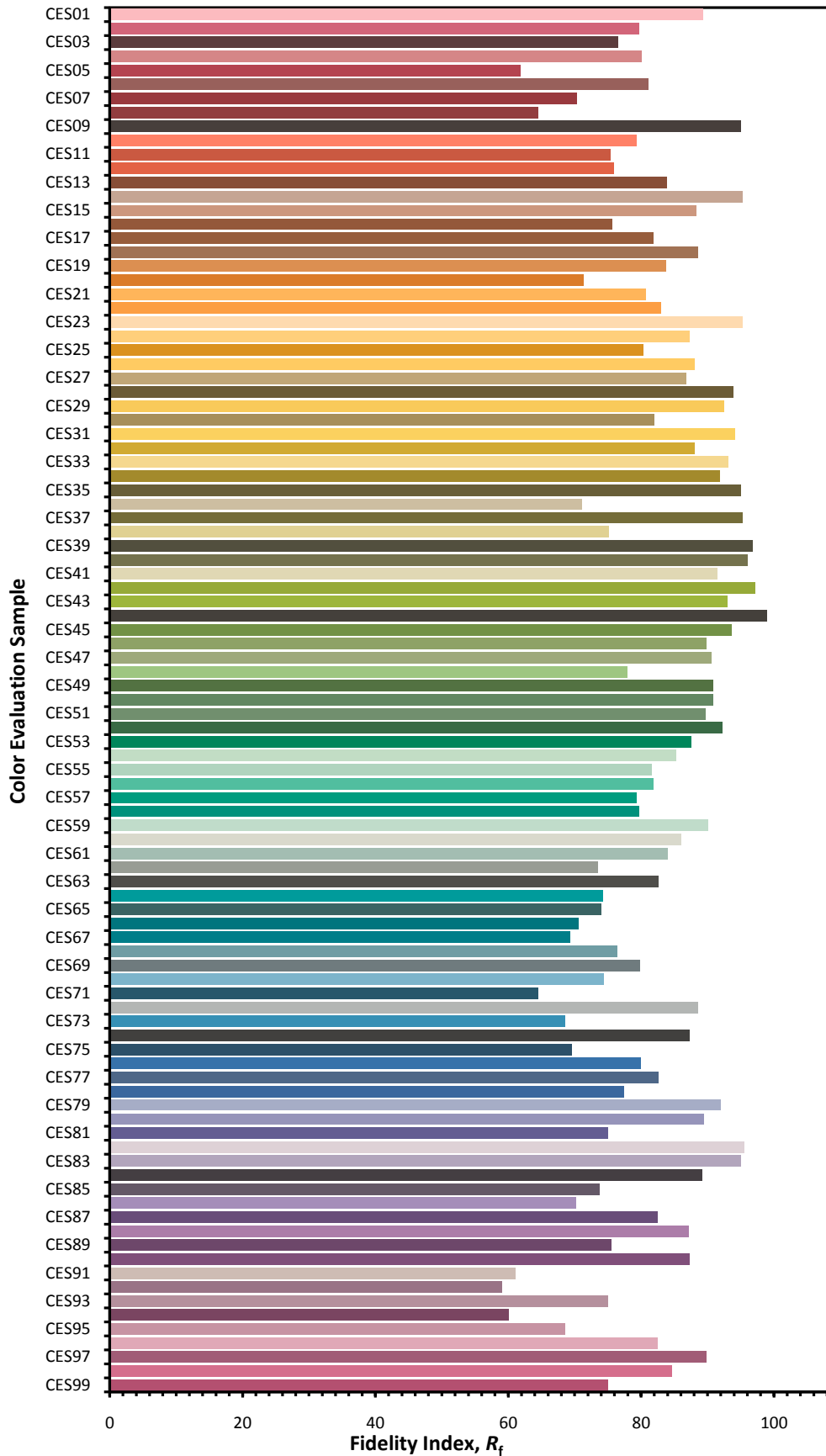


Color Vector Graphic

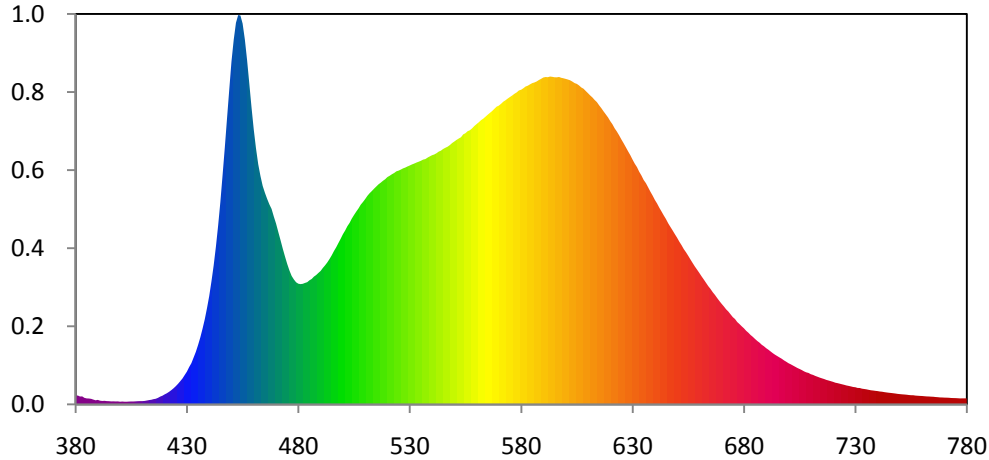


— Reference Illuminat — Test Source

Color Fidelity by CES Sample



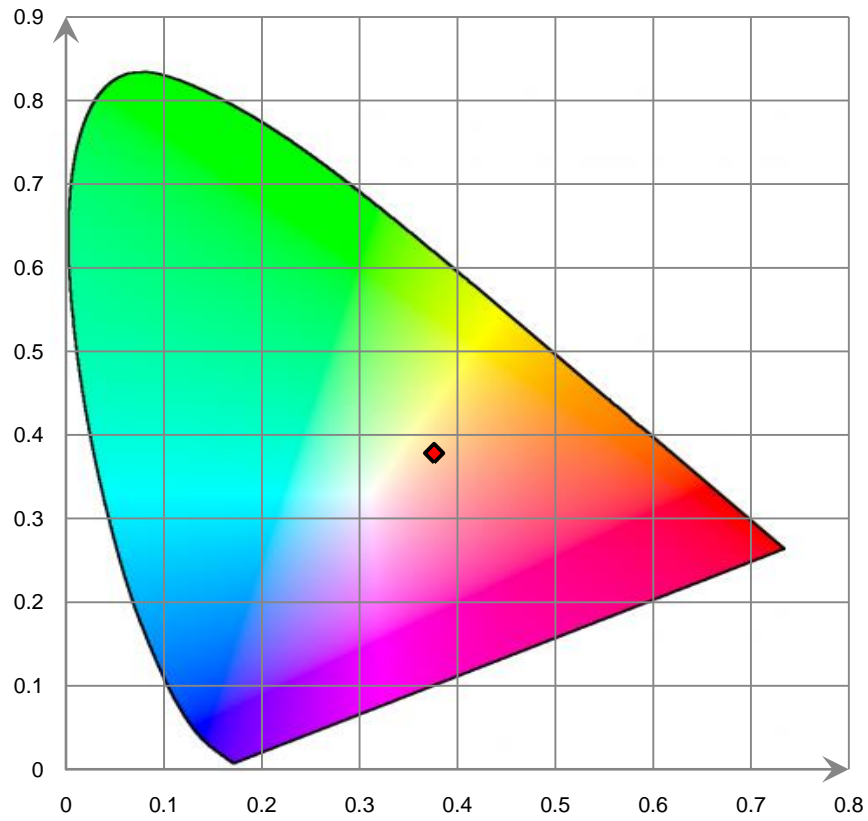
Relative Spectral Power Distribution



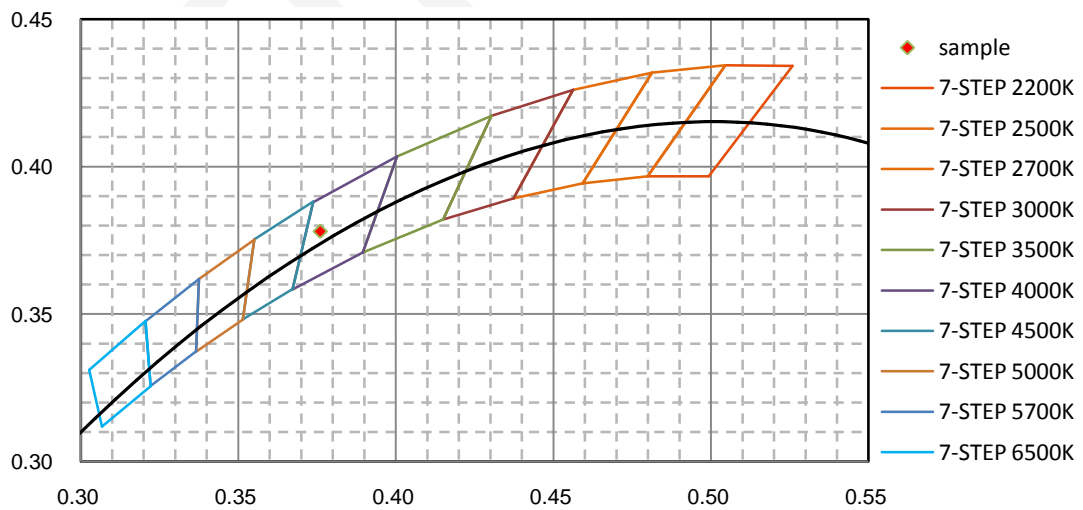
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	4.578E+00	421	5.815E+00	462	1.255E+02	503	9.486E+01	544	1.326E+02
381	4.642E+00	422	6.575E+00	463	1.194E+02	504	9.710E+01	545	1.335E+02
382	4.128E+00	423	7.454E+00	464	1.142E+02	505	9.901E+01	546	1.341E+02
383	4.168E+00	424	8.410E+00	465	1.106E+02	506	1.008E+02	547	1.347E+02
384	3.411E+00	425	9.512E+00	466	1.074E+02	507	1.024E+02	548	1.355E+02
385	3.125E+00	426	1.074E+01	467	1.046E+02	508	1.044E+02	549	1.366E+02
386	3.071E+00	427	1.210E+01	468	1.022E+02	509	1.058E+02	550	1.374E+02
387	2.889E+00	428	1.353E+01	469	9.815E+01	510	1.073E+02	551	1.382E+02
388	2.515E+00	429	1.534E+01	470	9.453E+01	511	1.090E+02	552	1.390E+02
389	2.130E+00	430	1.713E+01	471	9.014E+01	512	1.104E+02	553	1.396E+02
390	2.346E+00	431	1.948E+01	472	8.586E+01	513	1.115E+02	554	1.411E+02
391	1.930E+00	432	2.156E+01	473	8.146E+01	514	1.128E+02	555	1.417E+02
392	1.773E+00	433	2.450E+01	474	7.732E+01	515	1.139E+02	556	1.428E+02
393	1.853E+00	434	2.748E+01	475	7.345E+01	516	1.150E+02	557	1.433E+02
394	1.718E+00	435	3.104E+01	476	7.000E+01	517	1.159E+02	558	1.443E+02
395	1.675E+00	436	3.500E+01	477	6.715E+01	518	1.169E+02	559	1.455E+02
396	1.548E+00	437	3.948E+01	478	6.528E+01	519	1.177E+02	560	1.465E+02
397	1.588E+00	438	4.446E+01	479	6.382E+01	520	1.188E+02	561	1.474E+02
398	1.523E+00	439	5.025E+01	480	6.306E+01	521	1.195E+02	562	1.486E+02
399	1.549E+00	440	5.659E+01	481	6.286E+01	522	1.203E+02	563	1.493E+02
400	1.387E+00	441	6.418E+01	482	6.302E+01	523	1.209E+02	564	1.504E+02
401	1.480E+00	442	7.261E+01	483	6.348E+01	524	1.218E+02	565	1.514E+02
402	1.392E+00	443	8.242E+01	484	6.389E+01	525	1.222E+02	566	1.524E+02
403	1.397E+00	444	9.336E+01	485	6.486E+01	526	1.227E+02	567	1.534E+02
404	1.477E+00	445	1.058E+02	486	6.555E+01	527	1.233E+02	568	1.545E+02
405	1.502E+00	446	1.198E+02	487	6.677E+01	528	1.238E+02	569	1.556E+02
406	1.512E+00	447	1.342E+02	488	6.759E+01	529	1.244E+02	570	1.562E+02
407	1.586E+00	448	1.495E+02	489	6.869E+01	530	1.249E+02	571	1.571E+02
408	1.664E+00	449	1.646E+02	490	6.973E+01	531	1.254E+02	572	1.582E+02
409	1.709E+00	450	1.792E+02	491	7.131E+01	532	1.259E+02	573	1.590E+02
410	1.712E+00	451	1.906E+02	492	7.265E+01	533	1.264E+02	574	1.599E+02
411	1.787E+00	452	1.995E+02	493	7.419E+01	534	1.269E+02	575	1.607E+02
412	2.013E+00	453	2.035E+02	494	7.598E+01	535	1.273E+02	576	1.614E+02
413	2.253E+00	454	2.033E+02	495	7.793E+01	536	1.279E+02	577	1.623E+02
414	2.411E+00	455	1.990E+02	496	8.017E+01	537	1.282E+02	578	1.631E+02
415	2.740E+00	456	1.907E+02	497	8.211E+01	538	1.290E+02	579	1.641E+02
416	2.937E+00	457	1.800E+02	498	8.437E+01	539	1.296E+02	580	1.645E+02
417	3.402E+00	458	1.676E+02	499	8.655E+01	540	1.302E+02	581	1.652E+02
418	4.061E+00	459	1.552E+02	500	8.892E+01	541	1.306E+02	582	1.661E+02
419	4.540E+00	460	1.436E+02	501	9.085E+01	542	1.313E+02	583	1.666E+02
420	5.223E+00	461	1.338E+02	502	9.310E+01	543	1.321E+02	584	1.673E+02

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.679E+02	626	1.365E+02	667	5.721E+01	708	1.674E+01	749	5.489E+00
586	1.683E+02	627	1.344E+02	668	5.557E+01	709	1.642E+01	750	5.364E+00
587	1.688E+02	628	1.323E+02	669	5.400E+01	710	1.578E+01	751	5.241E+00
588	1.696E+02	629	1.303E+02	670	5.255E+01	711	1.540E+01	752	5.159E+00
589	1.702E+02	630	1.280E+02	671	5.118E+01	712	1.488E+01	753	5.063E+00
590	1.709E+02	631	1.258E+02	672	4.970E+01	713	1.446E+01	754	4.891E+00
591	1.711E+02	632	1.240E+02	673	4.853E+01	714	1.399E+01	755	4.786E+00
592	1.710E+02	633	1.216E+02	674	4.708E+01	715	1.361E+01	756	4.774E+00
593	1.713E+02	634	1.196E+02	675	4.561E+01	716	1.324E+01	757	4.600E+00
594	1.712E+02	635	1.173E+02	676	4.462E+01	717	1.280E+01	758	4.509E+00
595	1.710E+02	636	1.156E+02	677	4.304E+01	718	1.248E+01	759	4.434E+00
596	1.710E+02	637	1.135E+02	678	4.198E+01	719	1.211E+01	760	4.368E+00
597	1.711E+02	638	1.112E+02	679	4.083E+01	720	1.177E+01	761	4.272E+00
598	1.707E+02	639	1.092E+02	680	3.975E+01	721	1.135E+01	762	4.165E+00
599	1.704E+02	640	1.069E+02	681	3.848E+01	722	1.111E+01	763	4.123E+00
600	1.701E+02	641	1.050E+02	682	3.744E+01	723	1.082E+01	764	4.041E+00
601	1.698E+02	642	1.028E+02	683	3.627E+01	724	1.050E+01	765	3.982E+00
602	1.694E+02	643	1.009E+02	684	3.529E+01	725	1.023E+01	766	3.829E+00
603	1.687E+02	644	9.881E+01	685	3.419E+01	726	9.901E+00	767	3.763E+00
604	1.680E+02	645	9.690E+01	686	3.315E+01	727	9.655E+00	768	3.640E+00
605	1.675E+02	646	9.465E+01	687	3.227E+01	728	9.387E+00	769	3.611E+00
606	1.667E+02	647	9.276E+01	688	3.117E+01	729	9.106E+00	770	3.528E+00
607	1.657E+02	648	9.091E+01	689	3.034E+01	730	8.958E+00	771	3.505E+00
608	1.650E+02	649	8.897E+01	690	2.936E+01	731	8.601E+00	772	3.450E+00
609	1.638E+02	650	8.712E+01	691	2.854E+01	732	8.547E+00	773	3.343E+00
610	1.627E+02	651	8.505E+01	692	2.763E+01	733	8.205E+00	774	3.306E+00
611	1.615E+02	652	8.323E+01	693	2.674E+01	734	8.046E+00	775	3.258E+00
612	1.604E+02	653	8.117E+01	694	2.594E+01	735	7.855E+00	776	3.198E+00
613	1.591E+02	654	7.952E+01	695	2.522E+01	736	7.618E+00	777	3.125E+00
614	1.580E+02	655	7.767E+01	696	2.452E+01	737	7.369E+00	778	3.136E+00
615	1.563E+02	656	7.575E+01	697	2.385E+01	738	7.248E+00	779	3.142E+00
616	1.548E+02	657	7.386E+01	698	2.299E+01	739	7.076E+00	780	3.148E+00
617	1.532E+02	658	7.202E+01	699	2.230E+01	740	6.947E+00		
618	1.516E+02	659	7.038E+01	700	2.151E+01	741	6.730E+00		
619	1.500E+02	660	6.867E+01	701	2.096E+01	742	6.610E+00		
620	1.480E+02	661	6.692E+01	702	2.030E+01	743	6.406E+00		
621	1.464E+02	662	6.526E+01	703	1.968E+01	744	6.253E+00		
622	1.443E+02	663	6.352E+01	704	1.901E+01	745	6.077E+00		
623	1.426E+02	664	6.181E+01	705	1.848E+01	746	5.958E+00		
624	1.406E+02	665	6.036E+01	706	1.792E+01	747	5.816E+00		
625	1.385E+02	666	5.863E+01	707	1.724E+01	748	5.671E+00		

CIE 1931 x y Chromaticity Diagram



7-Step Chromaticity Quadrangles



[Goniophotometer System]

Total operating time for luminous intensity distribution: **1.0 hour**

Test orientation: **Downward**

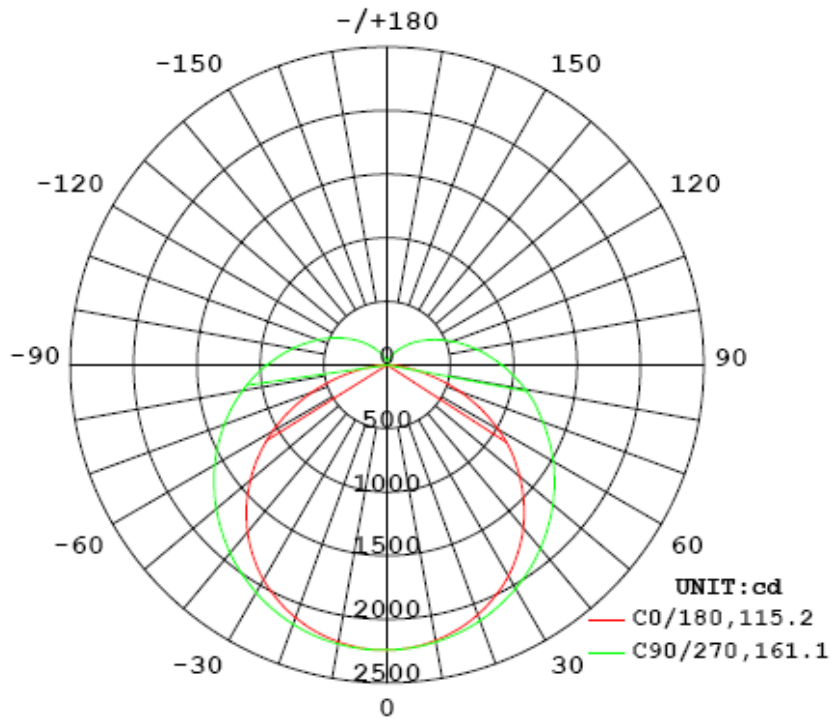
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.6690	79.96	0.9959

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
10026.5	125.39	2243.0	1.27	1.35

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	115.2	139.3	161.1	139.8	138.9
Field Angle (10% I _{max}):	159.7	242.4	271.5	243.6	229.3

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2241	2241	2241	2241	2241	2241	2241	2241
5.0°	2235	2238	2240	2241	2240	2236	2234	2231
10.0°	2211	2219	2226	2230	2228	2220	2212	2205
15.0°	2171	2183	2197	2206	2205	2192	2177	2163
20.0°	2114	2132	2153	2169	2170	2151	2128	2105
25.0°	2041	2064	2096	2120	2123	2099	2066	2033
30.0°	1951	1981	2027	2061	2067	2037	1992	1945
35.0°	1842	1881	1945	1992	2002	1965	1909	1842
40.0°	1715	1767	1851	1914	1929	1885	1815	1725
45.0°	1571	1638	1748	1828	1848	1798	1712	1595
50.0°	1410	1497	1638	1736	1761	1705	1602	1454
55.0°	1234	1346	1520	1638	1668	1607	1485	1303
60.0°	1045	1187	1398	1536	1572	1505	1364	1146
65.0°	843	1023	1273	1430	1471	1401	1242	987
70.0°	634	858	1148	1322	1368	1295	1119	829
75.0°	425	701	1025	1213	1263	1188	1000	677
80.0°	225	556	906	1104	1158	1082	884	541
85.0°	66	428	792	997	1053	977	774	420
90.0°	4	325	687	893	950	875	673	322
95.0°	1	246	592	793	851	778	582	247
100.0°	2	188	506	698	755	685	499	191
105.0°	4	146	429	610	664	600	423	150
110.0°	6	115	360	529	581	520	357	119
115.0°	8	91	300	452	501	445	298	95
120.0°	10	73	247	382	426	376	247	77
125.0°	12	62	201	318	358	314	202	65
130.0°	14	52	162	261	296	258	163	55
135.0°	15	45	129	210	240	208	130	47
140.0°	17	39	104	165	190	164	105	40
145.0°	18	35	83	127	146	126	84	35
150.0°	18	31	65	100	114	100	66	30
155.0°	18	29	51	75	85	75	50	25
160.0°	18	25	40	55	61	55	35	21
165.0°	17	20	32	39	43	37	25	18
170.0°	18	18	24	29	31	22	21	14
175.0°	19	18	17	17	11	14	15	14
180.0°	20	19	19	16	8	18	21	20

Luminous Intensity (cd) Distribution Data (cont.)

C γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	2241	2241	2241	2241	2241	2241	2241	2241
5.0°	2229	2227	2227	2228	2231	2233	2233	2234
10.0°	2199	2195	2197	2204	2211	2213	2212	2210
15.0°	2153	2149	2155	2169	2181	2183	2178	2170
20.0°	2090	2088	2100	2122	2140	2141	2130	2115
25.0°	2010	2013	2034	2064	2089	2088	2069	2045
30.0°	1915	1925	1958	1997	2029	2025	1995	1961
35.0°	1801	1821	1871	1922	1959	1952	1911	1862
40.0°	1672	1703	1776	1838	1882	1871	1816	1747
45.0°	1527	1571	1671	1749	1798	1782	1712	1619
50.0°	1367	1429	1559	1653	1708	1688	1600	1479
55.0°	1201	1280	1441	1553	1613	1587	1481	1329
60.0°	1014	1129	1318	1449	1514	1483	1359	1180
65.0°	815	966	1202	1343	1412	1376	1240	1017
70.0°	609	805	1077	1240	1308	1269	1117	854
75.0°	405	651	956	1138	1212	1167	994	696
80.0°	213	510	840	1033	1108	1060	875	551
85.0°	60	389	731	930	1006	955	764	424
90.0°	0	292	632	832	906	854	661	322
95.0°	1	220	542	738	809	757	568	243
100.0°	2	167	461	648	717	666	483	185
105.0°	2	129	390	564	629	580	408	144
110.0°	3	102	327	487	547	500	342	113
115.0°	5	83	272	415	470	426	284	90
120.0°	7	69	225	350	399	360	235	74
125.0°	10	58	184	292	335	300	192	62
130.0°	12	50	150	240	277	246	156	53
135.0°	13	43	120	194	225	199	126	46
140.0°	15	37	95	153	179	160	102	42
145.0°	16	29	72	117	140	126	85	40
150.0°	16	25	54	87	105	100	71	38
155.0°	16	20	39	63	78	77	60	37
160.0°	16	17	25	44	57	58	49	35
165.0°	15	15	21	30	41	43	39	31
170.0°	16	16	19	22	28	32	30	26
175.0°	18	18	19	19	18	25	24	23
180.0°	19	19	19	18	16	12	17	19

Zonal Lumen Density Measurement

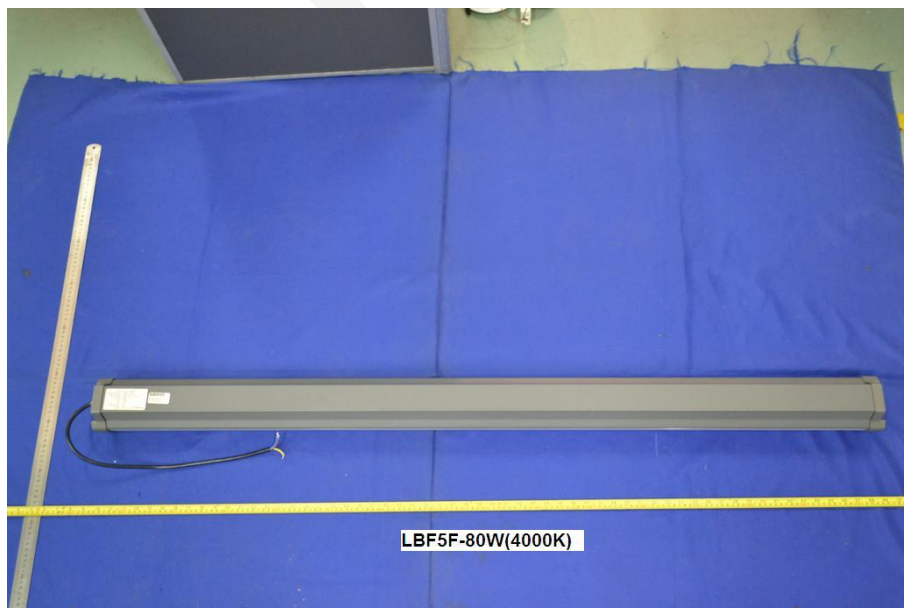
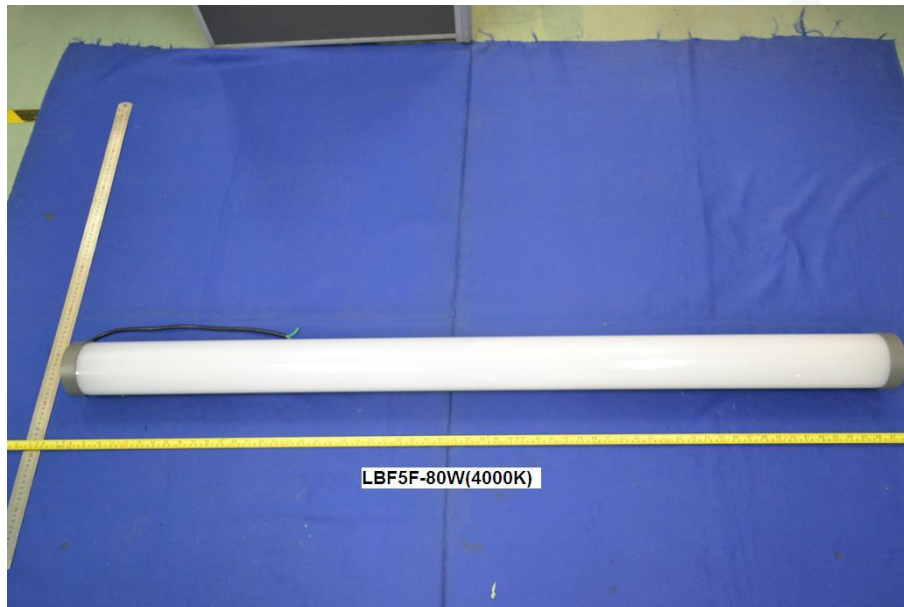
Deg	Flux (lm)	%
0-5	53.5	0.53
5-10	159.0	1.59
10-15	260.4	2.60
15-20	354.8	3.53
20-25	439.9	4.39
25-30	513.5	5.12
30-35	573.8	5.73
35-40	619.2	6.17
40-45	648.9	6.47
45-50	662.4	6.61
50-55	660.0	6.58
55-60	642.6	6.41
60-65	611.1	6.09
65-70	567.7	5.67
70-75	515.3	5.14
75-80	456.9	4.55
80-85	396.8	3.96
85-90	341.1	3.40
90-95	293.7	2.93
95-100	251.4	2.51
100-105	212.5	2.12
105-110	177.4	1.77
110-115	146.1	1.46
115-120	118.3	1.18
120-125	94.1	0.93
125-130	73.4	0.74
130-135	55.9	0.55
135-140	41.5	0.42
140-145	30.1	0.30
145-150	21.2	0.21
150-155	14.4	0.14
155-160	9.2	0.09
160-165	5.5	0.06
165-170	3.1	0.03
170-175	1.5	0.02
175-180	0.4	0.00

Deg	Flux (lm)	%
0-5	53.5	0.53
0-10	212.5	2.12
0-15	472.9	4.72
0-20	827.7	8.25
0-25	1267.5	12.64
0-30	1781.0	17.76
0-35	2354.8	23.49
0-40	2974.0	29.66
0-45	3622.9	36.13
0-50	4285.3	42.74
0-55	4945.2	49.32
0-60	5587.8	55.73
0-65	6198.9	61.82
0-70	6766.6	67.49
0-75	7281.9	72.63
0-80	7738.8	77.18
0-85	8135.6	81.14
0-90	8476.7	84.54
0-95	8770.5	87.47
0-100	9021.8	89.98
0-105	9234.3	92.10
0-110	9411.8	93.87
0-115	9557.9	95.33
0-120	9676.1	96.51
0-125	9770.2	97.44
0-130	9843.6	98.18
0-135	9899.5	98.73
0-140	9941.1	99.15
0-145	9971.1	99.45
0-150	9992.3	99.66
0-155	10006.7	99.80
0-160	10015.9	99.89
0-165	10021.5	99.95
0-170	10024.6	99.98
0-175	10026.0	100.00
0-180	10026.5	100.00

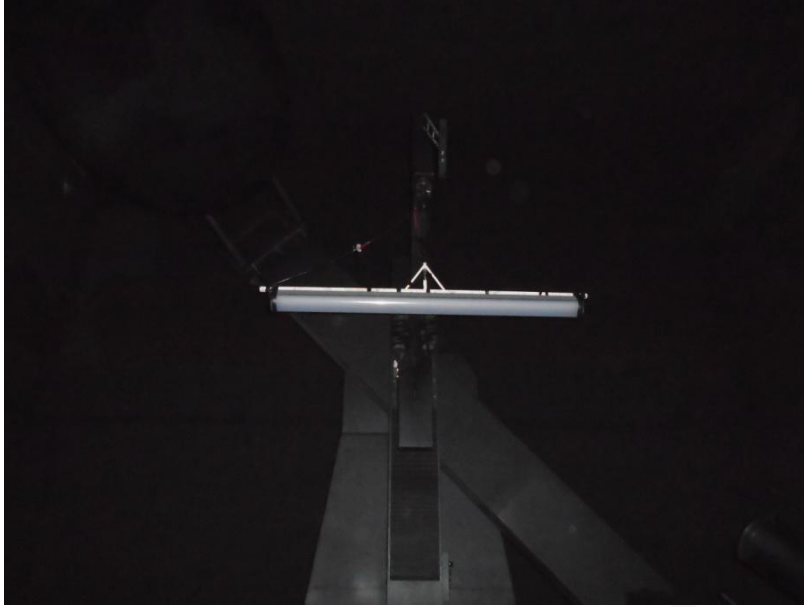
[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Power Factor:	277.0	60	0.919
Total Harmonic Distortion:	277.0	60	9.68%
Total Harmonic Distortion:	120.0	60	5.06%
Total Harmonic Distortion:	100.0	60	4.60%
Power Factor:	100.0	60	0.9978

6. Product Photo



7. Product Test orientation in the Goniophotometer



*****END OF REPORT*****