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: LBF4F-60W(4000K)

Report Type:	Electrical and Photometric tests including: Luminous Flux, Power Factor, Chromaticity, Luminous Intensity Distribution, THD
Test Engineer:	Carl Du
Report Number:	RSZ170314518-10
Test Date:	2017-03-17 to 2017-03-21
Report Date:	2017-05-03
Reviewed By:	Blake Zhang / EE Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.69,Pulongcun ,Puxinhu Industrial Area, Tangxia , Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588
Accreditation:	The IAS Accreditation Number TL-460.

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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).
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1. Product Description

General Information:

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

Model Tested:	LBF4F-60W(4000K)
Manufacturer:	SHENZHEN TUBU TECH CO.,LTD
Brand Name:	TUBU
Product Designation:	Low-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:	60 W
Nominal CCT:	4000K
Nominal Lumen Output:	7800 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
Integrating Sphere	SENSING	SPR-600	S09008	25～50°C	2017-03-09	2018-03-08
High Accuracy Array spectroradiometer	EVERFINE	HAAS-2000	M112048CA13 61125	380-780nm	2016-07-08	2017-07-07
Power meter	YOKOGAWA	WT310	C20E17024V	2kV/20A	2016-07-08	2017-07-07
DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	0~32V	2017-03-03	2018-03-02
Thermal Meter	SENSING	N/A	N/A	25、50°C	2017-03-09	2018-03-08
Standard Light Source	SENSING	N/A	LSD090808	N/A	2016-12-05	2017-12-04
AC Power Supply	ALL Power	APW-105N	970613	220V±10% 50Hz	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	YG108492N10 120001	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
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°C±1°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=20K (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°C±1°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.

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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	0.5001	59.79	0.9963	7925.5	132.55

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
24.132	4119	0.00171	0.3764	0.3779	0.2220	0.5015

Color Rendering Index

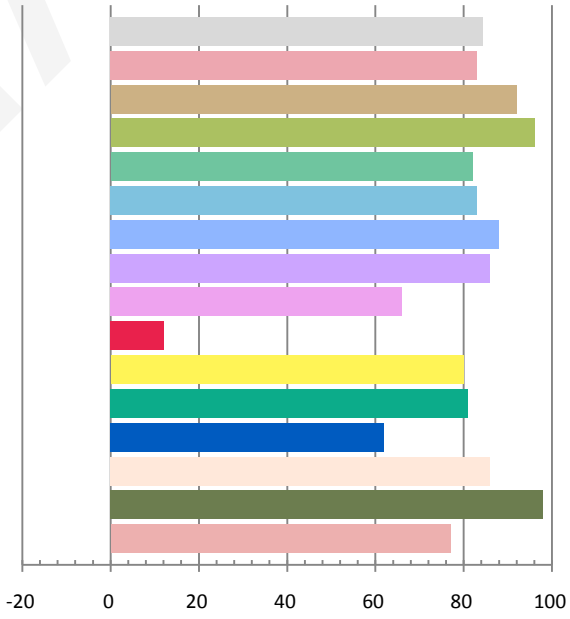
Ra
84.4

R1	R2	R3	R4
83	92	96	82

R5	R6	R7	R8
83	88	86	66

R9	R10	R11	R12
12	80	81	62

R13	R14	R15
86	98	77



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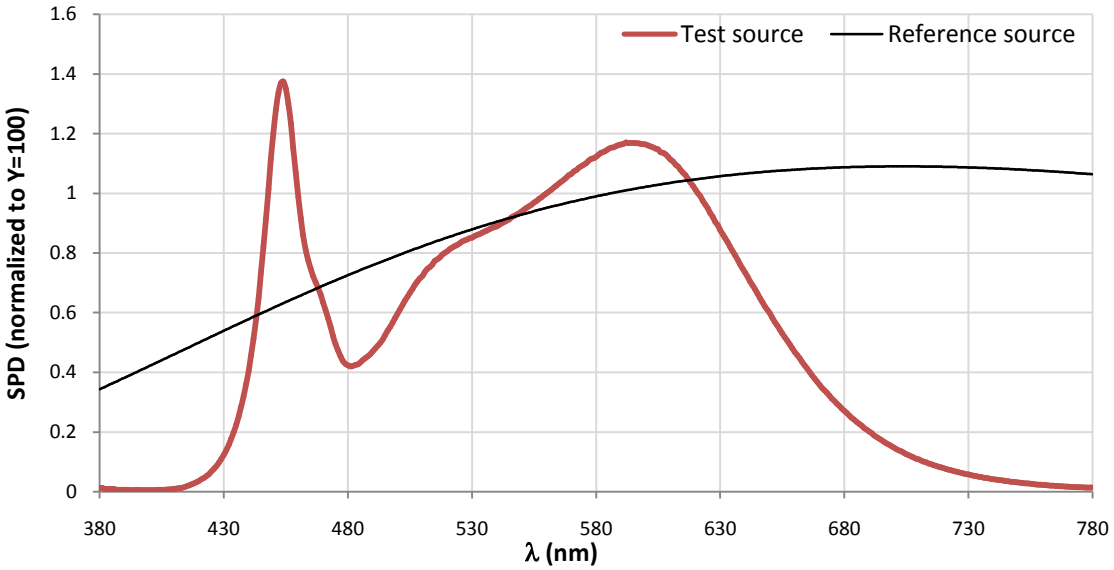
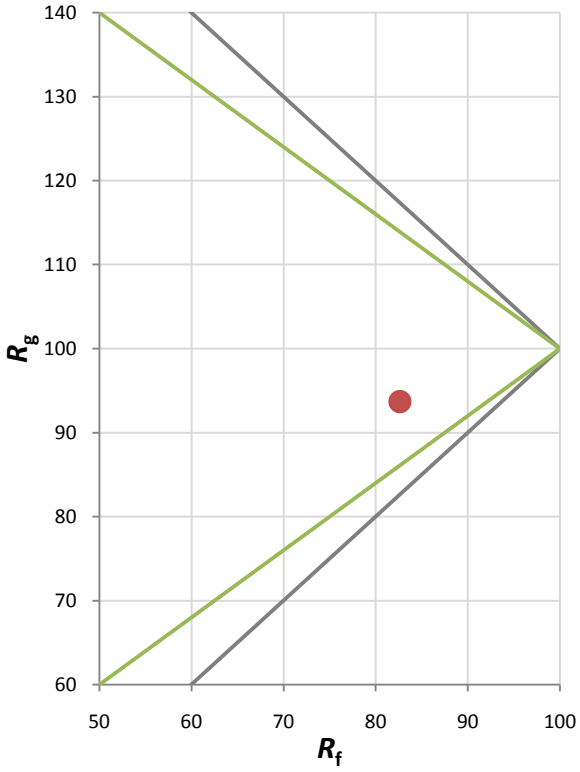
Fidelity Index and Gamut Index

Fidelity Index R_f	83
Gamut Index R_g	94

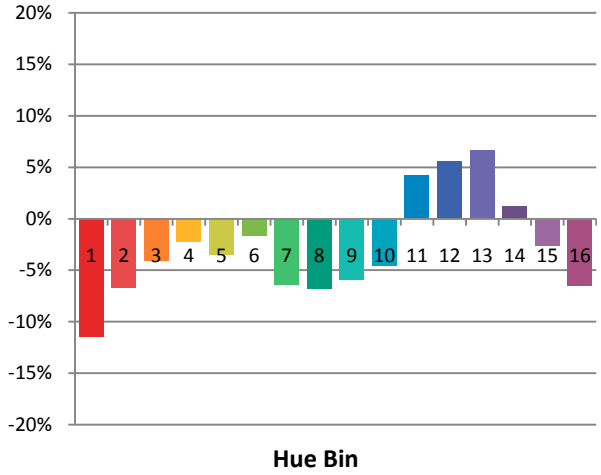
Spectral Power Distribution Comparison



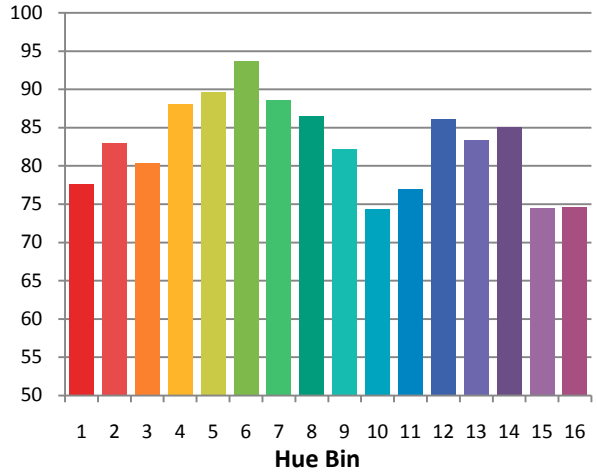
Plot of R_g versus R_f



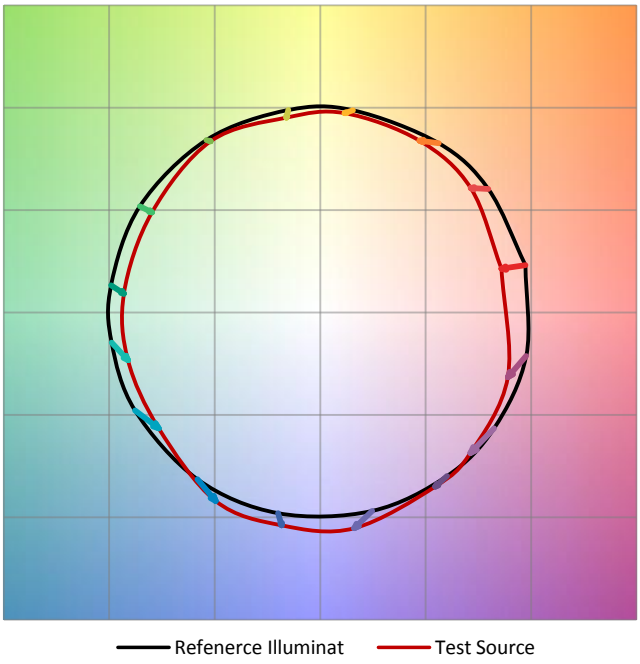
Chroma Shift by Hue

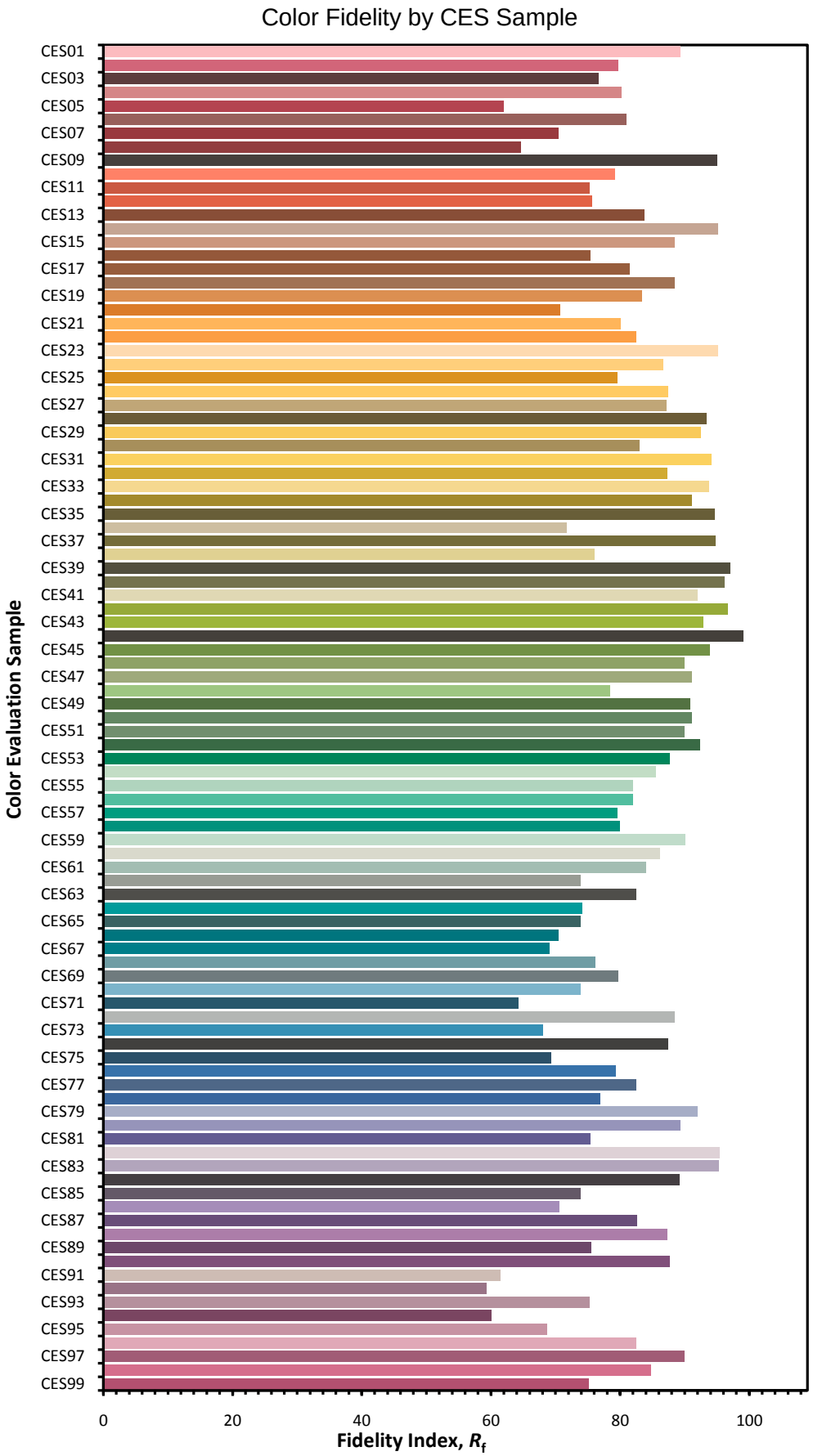


R_f by Hue



Color Vector Graphic




Color Fidelity by CES Sample
Color Evaluation Sample
CES01
CES03
CES05
CES07
CES09
CES11
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CES25
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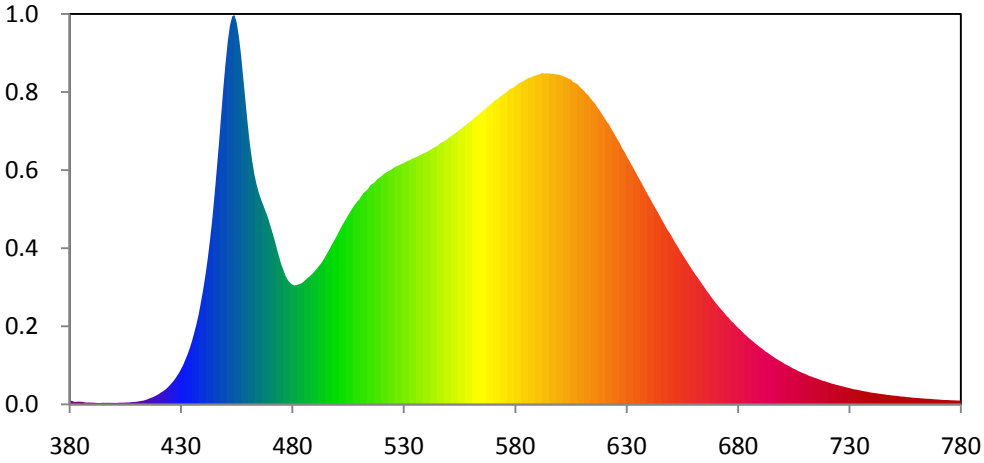
CES97
CES99
0
20
40
60
80
100
Fidelity Index, R_f

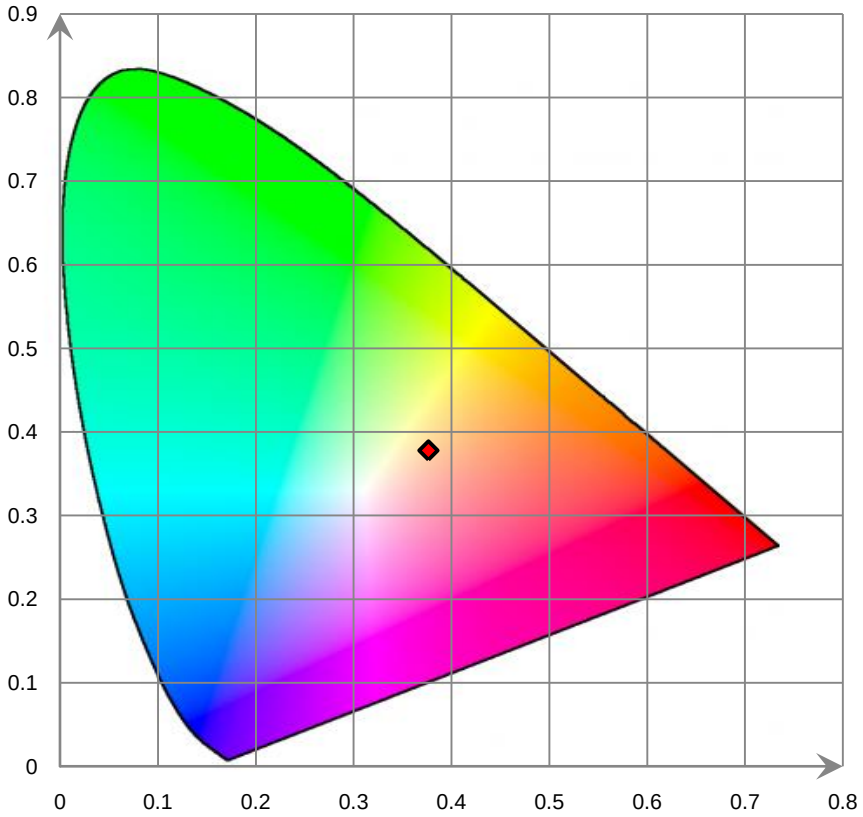
Relative Spectral Power Distribution



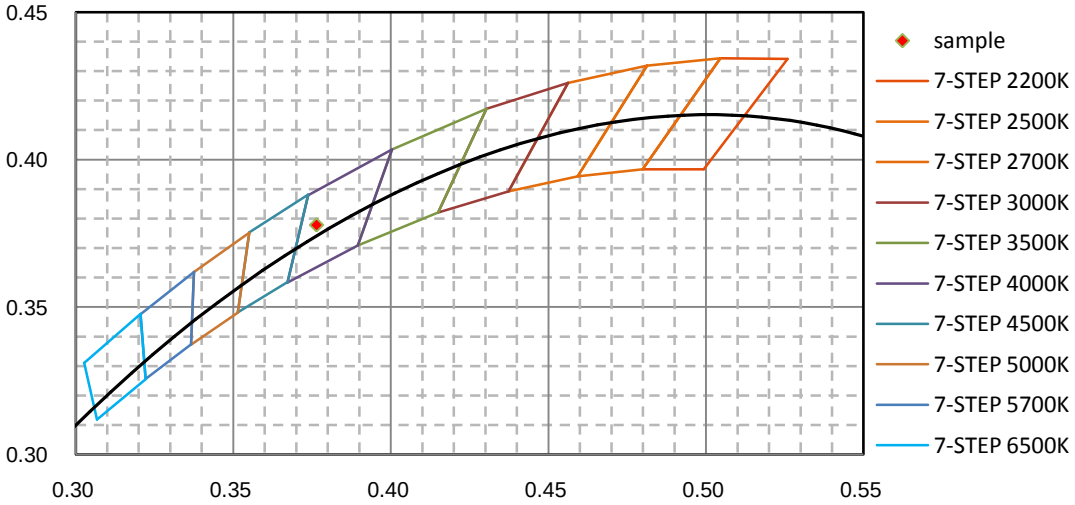
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	1.304E+00	421	4.839E+00	462	9.961E+01	503	7.430E+01	544	1.054E+02
381	1.467E+00	422	5.367E+00	463	9.402E+01	504	7.582E+01	545	1.059E+02
382	1.053E+00	423	6.059E+00	464	8.992E+01	505	7.744E+01	546	1.067E+02
383	1.042E+00	424	6.863E+00	465	8.658E+01	506	7.889E+01	547	1.073E+02
384	1.117E+00	425	7.808E+00	466	8.386E+01	507	8.043E+01	548	1.077E+02
385	1.080E+00	426	8.859E+00	467	8.154E+01	508	8.173E+01	549	1.083E+02
386	1.026E+00	427	9.977E+00	468	7.912E+01	509	8.297E+01	550	1.090E+02
387	7.834E-01	428	1.130E+01	469	7.665E+01	510	8.385E+01	551	1.097E+02
388	7.385E-01	429	1.270E+01	470	7.371E+01	511	8.538E+01	552	1.104E+02
389	7.478E-01	430	1.434E+01	471	7.064E+01	512	8.658E+01	553	1.110E+02
390	7.270E-01	431	1.616E+01	472	6.738E+01	513	8.737E+01	554	1.116E+02
391	7.002E-01	432	1.831E+01	473	6.403E+01	514	8.829E+01	555	1.125E+02
392	6.061E-01	433	2.056E+01	474	6.069E+01	515	8.974E+01	556	1.130E+02
393	5.969E-01	434	2.314E+01	475	5.746E+01	516	9.033E+01	557	1.139E+02
394	5.680E-01	435	2.604E+01	476	5.501E+01	517	9.102E+01	558	1.145E+02
395	6.923E-01	436	2.944E+01	477	5.261E+01	518	9.217E+01	559	1.153E+02
396	6.022E-01	437	3.296E+01	478	5.091E+01	519	9.284E+01	560	1.159E+02
397	6.569E-01	438	3.706E+01	479	4.982E+01	520	9.347E+01	561	1.167E+02
398	6.337E-01	439	4.195E+01	480	4.908E+01	521	9.432E+01	562	1.175E+02
399	6.190E-01	440	4.706E+01	481	4.874E+01	522	9.499E+01	563	1.183E+02
400	6.099E-01	441	5.290E+01	482	4.885E+01	523	9.545E+01	564	1.190E+02
401	5.908E-01	442	5.952E+01	483	4.928E+01	524	9.597E+01	565	1.198E+02
402	6.597E-01	443	6.703E+01	484	4.953E+01	525	9.654E+01	566	1.206E+02
403	7.190E-01	444	7.521E+01	485	5.025E+01	526	9.723E+01	567	1.213E+02
404	6.924E-01	445	8.501E+01	486	5.108E+01	527	9.766E+01	568	1.221E+02
405	7.477E-01	446	9.531E+01	487	5.190E+01	528	9.801E+01	569	1.231E+02
406	7.899E-01	447	1.062E+02	488	5.261E+01	529	9.857E+01	570	1.236E+02
407	8.257E-01	448	1.177E+02	489	5.352E+01	530	9.883E+01	571	1.246E+02
408	9.043E-01	449	1.293E+02	490	5.449E+01	531	9.941E+01	572	1.251E+02
409	9.939E-01	450	1.394E+02	491	5.561E+01	532	9.979E+01	573	1.259E+02
410	1.056E+00	451	1.486E+02	492	5.674E+01	533	1.002E+02	574	1.265E+02
411	1.244E+00	452	1.552E+02	493	5.786E+01	534	1.007E+02	575	1.272E+02
412	1.404E+00	453	1.589E+02	494	5.928E+01	535	1.011E+02	576	1.278E+02
413	1.517E+00	454	1.595E+02	495	6.087E+01	536	1.015E+02	577	1.287E+02
414	1.790E+00	455	1.566E+02	496	6.252E+01	537	1.020E+02	578	1.294E+02
415	2.089E+00	456	1.508E+02	497	6.411E+01	538	1.025E+02	579	1.297E+02
416	2.499E+00	457	1.431E+02	498	6.587E+01	539	1.029E+02	580	1.303E+02
417	2.798E+00	458	1.336E+02	499	6.746E+01	540	1.032E+02	581	1.310E+02
418	3.225E+00	459	1.240E+02	500	6.915E+01	541	1.038E+02	582	1.318E+02
419	3.671E+00	460	1.146E+02	501	7.087E+01	542	1.044E+02	583	1.321E+02
420	4.204E+00	461	1.063E+02	502	7.266E+01	543	1.049E+02	584	1.326E+02

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	1.332E+02	626	1.084E+02	667	4.530E+01	708	1.331E+01	749	3.665E+00
586	1.337E+02	627	1.069E+02	668	4.401E+01	709	1.283E+01	750	3.583E+00
587	1.339E+02	628	1.049E+02	669	4.282E+01	710	1.256E+01	751	3.504E+00
588	1.344E+02	629	1.036E+02	670	4.161E+01	711	1.212E+01	752	3.397E+00
589	1.347E+02	630	1.018E+02	671	4.046E+01	712	1.167E+01	753	3.218E+00
590	1.350E+02	631	1.002E+02	672	3.942E+01	713	1.138E+01	754	3.198E+00
591	1.352E+02	632	9.859E+01	673	3.839E+01	714	1.098E+01	755	3.109E+00
592	1.358E+02	633	9.697E+01	674	3.730E+01	715	1.073E+01	756	2.960E+00
593	1.355E+02	634	9.527E+01	675	3.620E+01	716	1.034E+01	757	2.909E+00
594	1.356E+02	635	9.355E+01	676	3.530E+01	717	1.006E+01	758	2.780E+00
595	1.356E+02	636	9.193E+01	677	3.416E+01	718	9.713E+00	759	2.729E+00
596	1.355E+02	637	9.024E+01	678	3.335E+01	719	9.492E+00	760	2.651E+00
597	1.355E+02	638	8.851E+01	679	3.236E+01	720	9.184E+00	761	2.574E+00
598	1.353E+02	639	8.687E+01	680	3.142E+01	721	8.841E+00	762	2.498E+00
599	1.351E+02	640	8.521E+01	681	3.056E+01	722	8.547E+00	763	2.410E+00
600	1.350E+02	641	8.360E+01	682	2.965E+01	723	8.355E+00	764	2.352E+00
601	1.346E+02	642	8.192E+01	683	2.876E+01	724	8.026E+00	765	2.285E+00
602	1.343E+02	643	8.033E+01	684	2.799E+01	725	7.837E+00	766	2.250E+00
603	1.339E+02	644	7.876E+01	685	2.712E+01	726	7.597E+00	767	2.169E+00
604	1.334E+02	645	7.706E+01	686	2.634E+01	727	7.368E+00	768	2.096E+00
605	1.331E+02	646	7.538E+01	687	2.559E+01	728	7.122E+00	769	2.041E+00
606	1.320E+02	647	7.378E+01	688	2.479E+01	729	6.871E+00	770	1.976E+00
607	1.317E+02	648	7.206E+01	689	2.410E+01	730	6.682E+00	771	1.915E+00
608	1.311E+02	649	7.066E+01	690	2.334E+01	731	6.423E+00	772	1.830E+00
609	1.301E+02	650	6.928E+01	691	2.277E+01	732	6.192E+00	773	1.792E+00
610	1.292E+02	651	6.766E+01	692	2.194E+01	733	6.096E+00	774	1.791E+00
611	1.284E+02	652	6.599E+01	693	2.130E+01	734	5.871E+00	775	1.727E+00
612	1.272E+02	653	6.456E+01	694	2.068E+01	735	5.699E+00	776	1.672E+00
613	1.264E+02	654	6.299E+01	695	2.005E+01	736	5.509E+00	777	1.668E+00
614	1.252E+02	655	6.159E+01	696	1.945E+01	737	5.331E+00	778	1.604E+00
615	1.240E+02	656	6.011E+01	697	1.876E+01	738	5.163E+00	779	1.583E+00
616	1.230E+02	657	5.871E+01	698	1.826E+01	739	4.974E+00	780	1.587E+00
617	1.215E+02	658	5.723E+01	699	1.772E+01	740	4.803E+00		
618	1.203E+02	659	5.584E+01	700	1.719E+01	741	4.689E+00		
619	1.189E+02	660	5.441E+01	701	1.657E+01	742	4.582E+00		
620	1.175E+02	661	5.310E+01	702	1.609E+01	743	4.418E+00		
621	1.160E+02	662	5.188E+01	703	1.566E+01	744	4.302E+00		
622	1.149E+02	663	5.052E+01	704	1.512E+01	745	4.136E+00		
623	1.131E+02	664	4.915E+01	705	1.461E+01	746	4.052E+00		
624	1.116E+02	665	4.790E+01	706	1.422E+01	747	3.894E+00		
625	1.101E+02	666	4.649E+01	707	1.367E+01	748	3.809E+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**

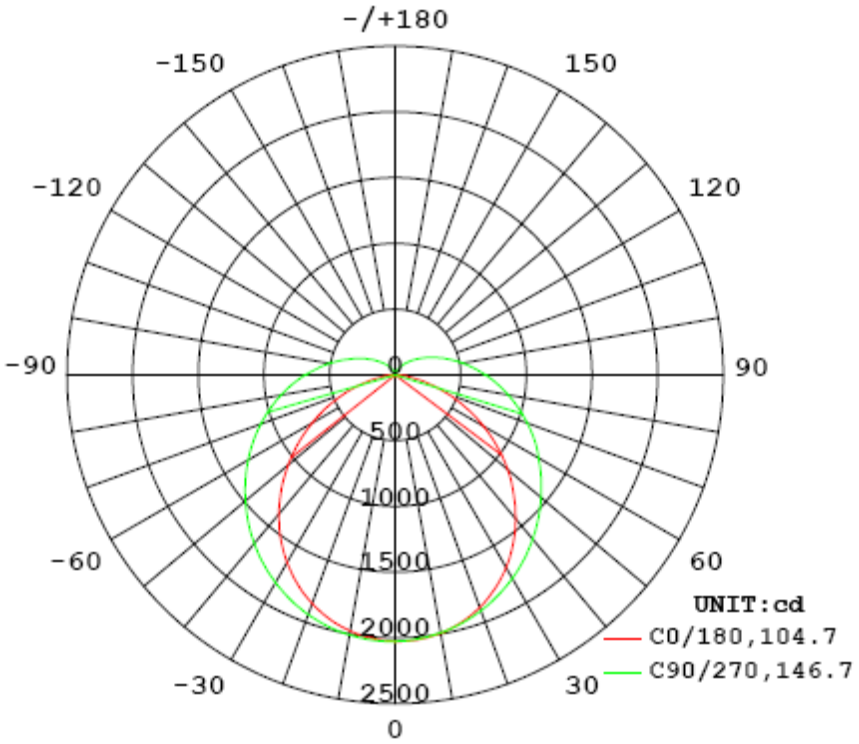
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
119.9	60	0.4999	59.75	0.9965

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
7954.6	133.13	2026.0	1.24	1.32

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	104.7	126.0	146.7	125.6	125.8
Field Angle (10% I_{max}):	154.8	224.7	251.4	224.2	213.8

Luminous Intensity (cd) Distribution Data

C / γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	2025	2025	2025	2025	2025	2025	2025	2025
5.0°	2011	2014	2017	2020	2023	2023	2022	2021
10.0°	1977	1983	1993	2002	2008	2007	2003	1997
15.0°	1924	1935	1953	1970	1980	1978	1968	1956
20.0°	1851	1868	1898	1925	1939	1935	1917	1894
25.0°	1759	1783	1828	1868	1887	1879	1851	1815
30.0°	1649	1683	1745	1799	1825	1813	1771	1718
35.0°	1522	1567	1651	1722	1753	1737	1679	1605
40.0°	1380	1439	1547	1635	1672	1651	1577	1478
45.0°	1228	1301	1435	1542	1584	1558	1466	1340
50.0°	1066	1157	1319	1443	1491	1459	1349	1194
55.0°	899	1009	1199	1341	1394	1356	1228	1043
60.0°	731	862	1079	1237	1295	1251	1106	892
65.0°	572	720	960	1133	1193	1145	985	746
70.0°	409	587	845	1027	1091	1039	869	608
75.0°	261	466	737	923	987	934	757	484
80.0°	130	359	635	821	884	830	652	373
85.0°	36	270	544	722	783	729	559	281
90.0°	1	201	459	627	685	634	471	209
95.0°	1	149	384	542	594	547	394	156
100.0°	1	112	318	460	509	465	326	117
105.0°	1	85	261	387	431	391	268	89
110.0°	2	65	213	322	361	325	218	68
115.0°	2	50	172	266	299	268	176	53
120.0°	3	39	138	217	245	219	141	42
125.0°	3	31	109	175	199	177	112	33
130.0°	4	25	86	140	160	141	88	26
135.0°	5	20	67	110	127	111	69	21
140.0°	5	17	52	85	98	86	53	18
145.0°	6	14	40	65	75	65	41	15
150.0°	7	12	30	48	56	48	31	13
155.0°	7	11	22	35	40	35	23	11
160.0°	7	10	17	24	27	24	17	9
165.0°	7	9	12	16	18	16	11	8
170.0°	7	8	10	11	12	11	8	7
175.0°	7	7	7	8	8	7	7	7
180.0°	7	7	7	5	5	6	7	7

FINAL

Luminous Intensity (cd) Distribution Data (cont.)

C / γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	2025	2025	2025	2025	2025	2025	2025	2025
5.0°	2019	2017	2017	2015	2014	2013	2011	2010
10.0°	1993	1991	1992	1992	1990	1986	1981	1977
15.0°	1948	1947	1951	1956	1955	1947	1935	1925
20.0°	1882	1883	1895	1906	1908	1895	1874	1855
25.0°	1795	1801	1825	1846	1851	1833	1799	1768
30.0°	1690	1703	1743	1777	1785	1761	1713	1666
35.0°	1567	1589	1649	1698	1711	1681	1616	1549
40.0°	1428	1462	1546	1612	1630	1593	1511	1420
45.0°	1276	1324	1435	1520	1543	1499	1398	1283
50.0°	1119	1187	1319	1422	1451	1401	1283	1146
55.0°	948	1037	1209	1323	1356	1302	1173	998
60.0°	774	888	1090	1227	1262	1208	1054	852
65.0°	601	743	972	1126	1170	1106	938	711
70.0°	435	606	858	1023	1071	1004	826	579
75.0°	279	482	750	922	972	904	721	459
80.0°	142	374	649	824	875	807	623	355
85.0°	38	284	557	729	780	714	534	269
90.0°	0	214	475	640	688	626	455	202
95.0°	0	162	401	556	602	544	385	153
100.0°	1	123	337	478	521	468	323	116
105.0°	1	95	281	407	446	399	270	90
110.0°	1	75	232	344	379	337	223	71
115.0°	2	60	191	287	318	282	184	56
120.0°	3	48	155	238	265	234	150	45
125.0°	3	39	125	195	218	191	121	37
130.0°	4	32	100	157	177	155	97	30
135.0°	4	26	79	125	142	123	77	25
140.0°	5	20	60	97	111	98	62	22
145.0°	5	15	44	73	86	77	50	20
150.0°	6	12	31	53	64	59	41	19
155.0°	6	8	21	36	46	44	33	18
160.0°	6	7	13	24	31	32	25	16
165.0°	6	6	9	15	20	22	19	14
170.0°	6	6	7	9	13	14	13	11
175.0°	6	6	7	7	7	9	9	8
180.0°	7	7	7	7	6	5	6	7

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Zonal Lumen Density Measurement

Deg	Flux (lm)	%
0-5	48.3	0.61
5-10	143.4	1.80
10-15	233.9	2.94
15-20	317.0	3.99
20-25	390.1	4.90
25-30	451.0	5.67
30-35	498.2	6.26
35-40	530.4	6.67
40-45	547.4	6.88
45-50	549.7	6.91
50-55	538.2	6.77
55-60	514.3	6.46
60-65	480.3	6.04
65-70	437.9	5.51
70-75	390.3	4.90
75-80	340.1	4.28
80-85	290.8	3.65
85-90	245.9	3.10
90-95	207.7	2.61
95-100	173.7	2.18
100-105	143.2	1.80
105-110	116.4	1.46
110-115	93.2	1.17
115-120	73.5	0.93
120-125	57.0	0.71
125-130	43.3	0.55
130-135	32.2	0.40
135-140	23.3	0.30
140-145	16.4	0.20
145-150	11.2	0.14
150-155	7.3	0.10
155-160	4.5	0.05
160-165	2.6	0.03
165-170	1.3	0.02
170-175	0.6	0.01
175-180	0.2	0.00

Deg	Flux (lm)	%
0-5	48.3	0.61
0-10	191.7	2.41
0-15	425.7	5.35
0-20	742.7	9.34
0-25	1132.7	14.24
0-30	1583.8	19.91
0-35	2082.0	26.17
0-40	2612.4	32.84
0-45	3159.8	39.72
0-50	3709.5	46.63
0-55	4247.7	53.40
0-60	4762.0	59.86
0-65	5242.3	65.90
0-70	5680.2	71.41
0-75	6070.4	76.31
0-80	6410.5	80.59
0-85	6701.3	84.24
0-90	6947.2	87.34
0-95	7154.9	89.95
0-100	7328.5	92.13
0-105	7471.7	93.93
0-110	7588.1	95.39
0-115	7681.3	96.56
0-120	7754.7	97.49
0-125	7811.7	98.20
0-130	7855.0	98.75
0-135	7887.2	99.15
0-140	7910.6	99.45
0-145	7927.0	99.65
0-150	7938.2	99.79
0-155	7945.5	99.89
0-160	7950.0	99.94
0-165	7952.5	99.97
0-170	7953.8	99.99
0-175	7954.4	100.00
0-180	7954.6	100.00

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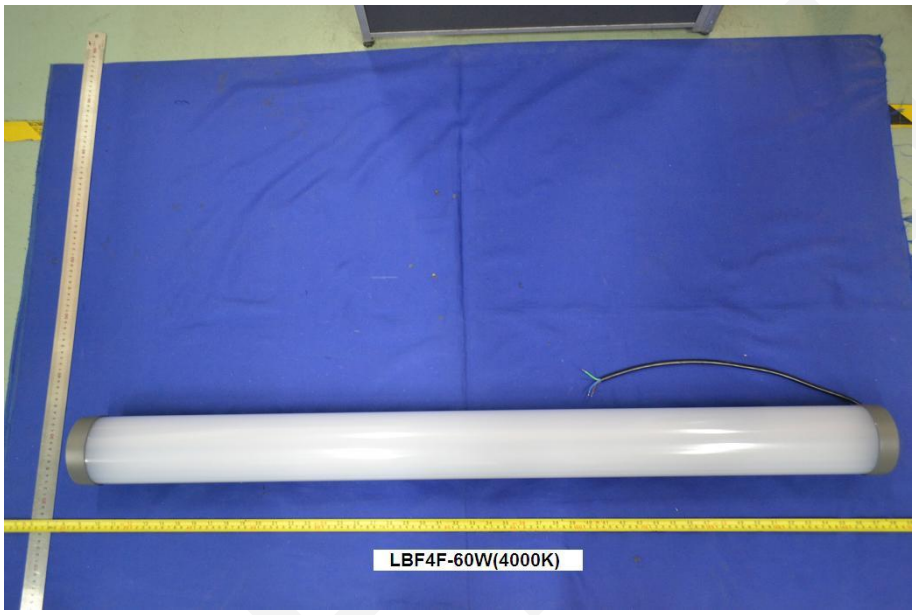
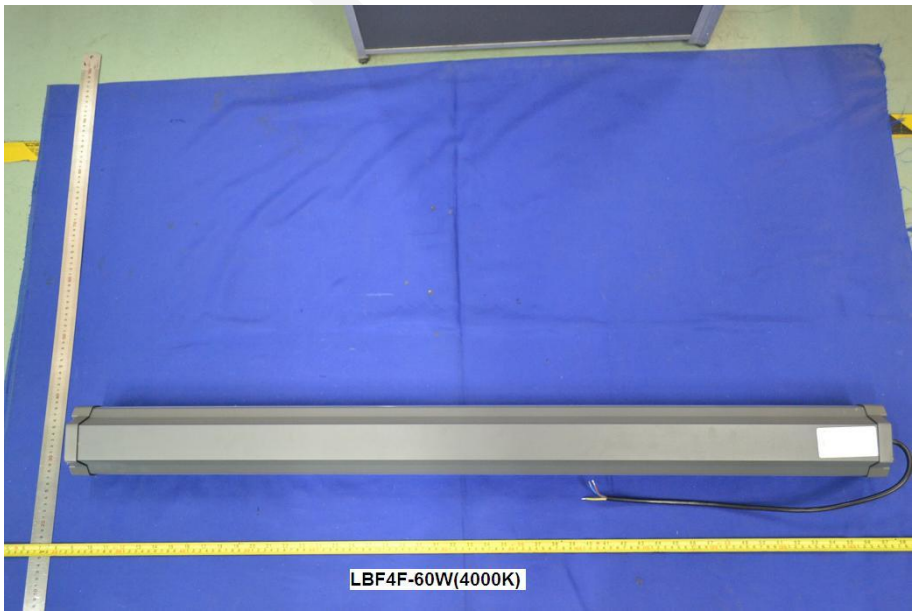
[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Power Factor:	277.0	60	0.937
Total Harmonic Distortion:	277.0	60	6.78%
Total Harmonic Distortion:	120.0	60	6.69%
Total Harmonic Distortion:	100.0	60	5.96%
Power Factor:	100.0	60	0.9974

6. Product Photo





7. Product Test orientation in the Goniophotometer

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

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