



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: LHB-180W(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:	RSZ170208502-10
Test Date:	2017-02-10 to 2017-02-13
Report Date:	2017-03-10
Reviewed By:	Blake Zhang / EE Engineer <i>Blake Zhang</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Dongguan). No.69,Pulongcun ,Puxihu Industrial Area, Tangxia , Dongguan, Guangdong, China. Tel: +86-0769-86858888 Fax:+86-0769-86858588
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 2017-02-08 and used for testing.

Model Tested: LHB-180W(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: 100-277 V AC 50/60Hz
 Rated Power: 180 W
 Nominal CCT: 4000K
 Nominal Lumen Output: 23400 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	Manufacturer	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
Temperature/humidity/clock	Victor	VC230	EE023	0~40°C0~90%	2016-03-21	2017-03-20
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	2016-03-21	2017-03-20
Standard Light Source	EVERFINE	D908	1012003	N/A	2016-09-07	2017-09-06

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_i , 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**

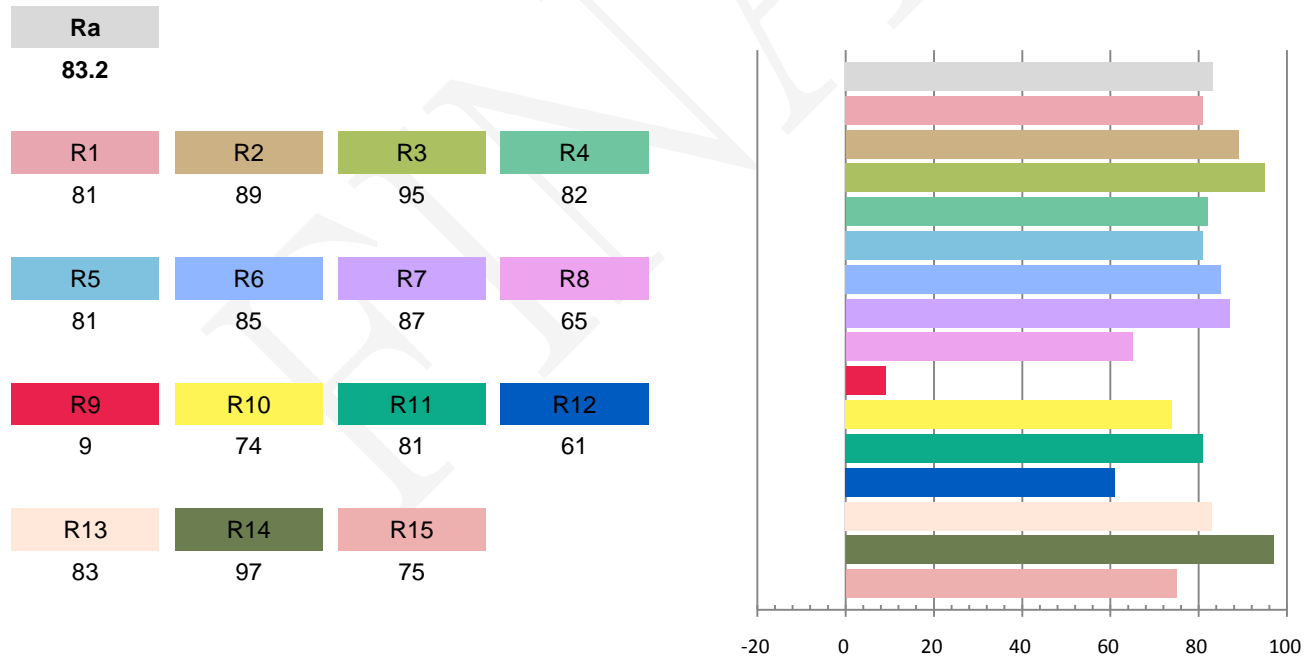
Test orientation: **Downward**

Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	1.516	181.1	0.9953	24845	137.18

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
74.741	3992	0.00331	0.3831	0.3856	0.2234	0.5058

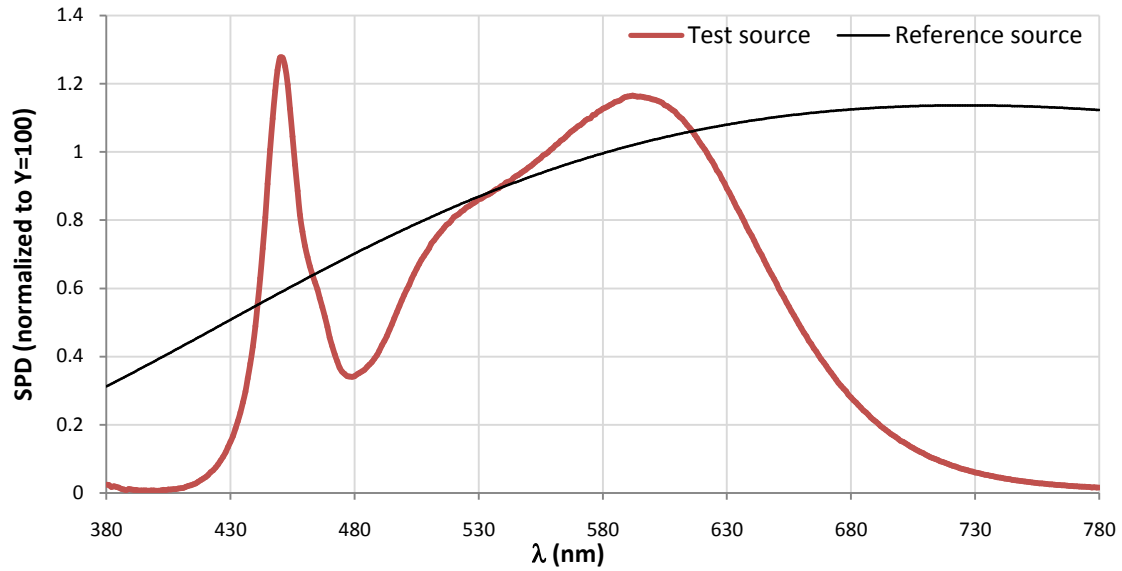
Color Rendering Index



Fidelity Index and Gamut Index

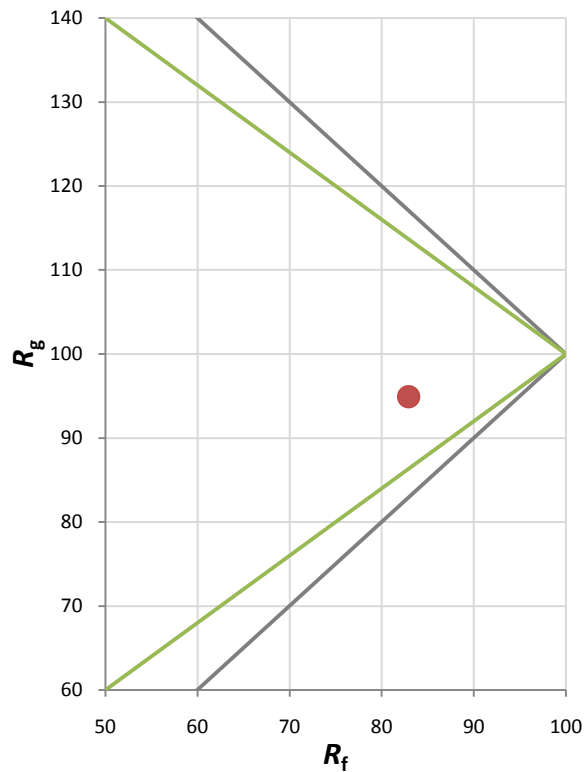
Fidelity Index R_f	83
Gamut Index R_g	95

Spectral Power Distribution Comparison

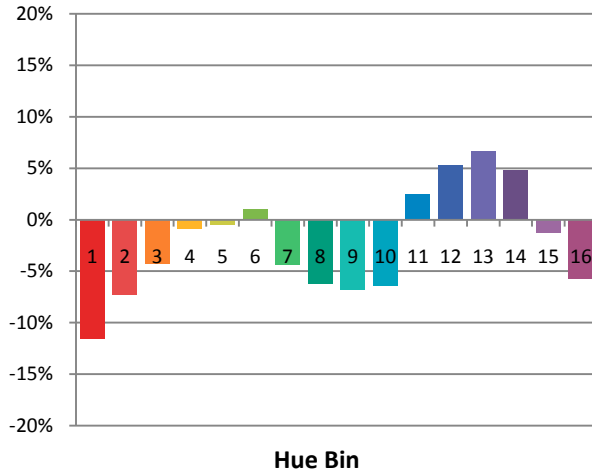


b

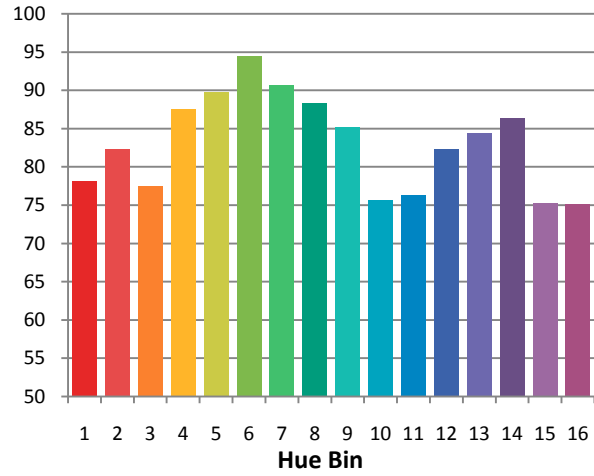
Plot of R_g versus R_f



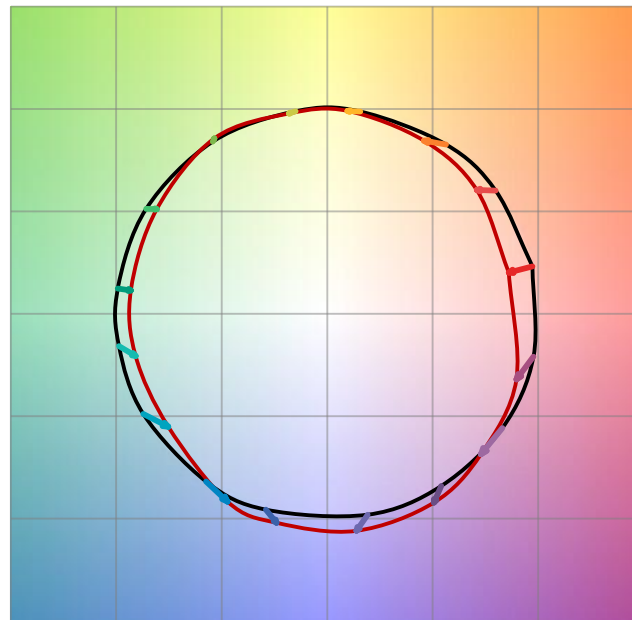
Chroma Shift by Hue



R_f by Hue

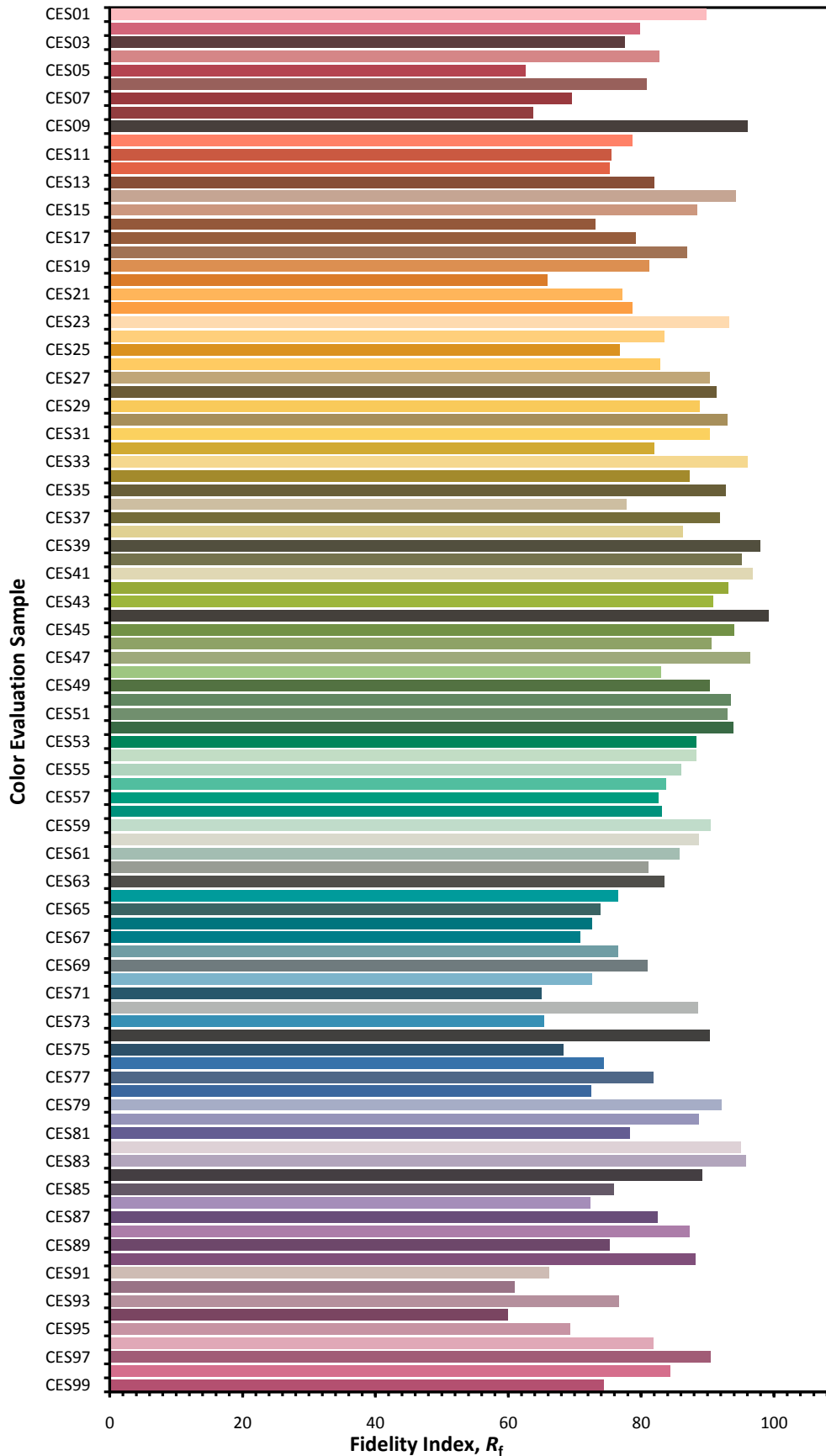


Color Vector Graphic

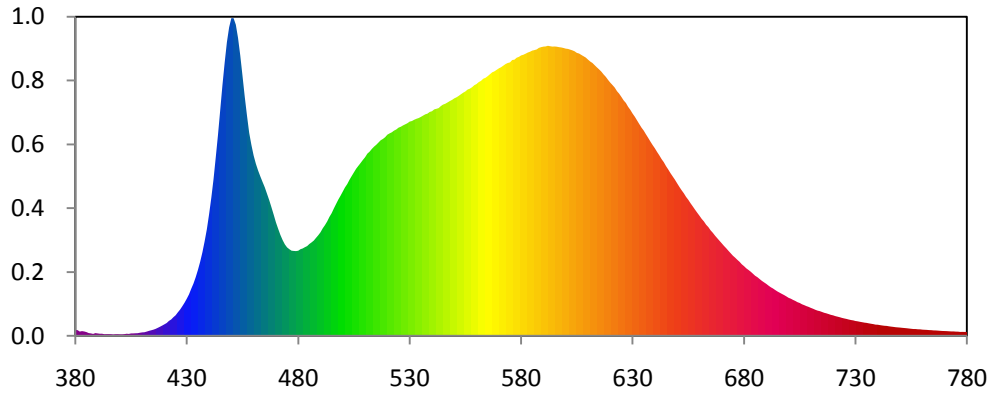


— Reference Illuminat — Test Source

Color Fidelity by CES Sample



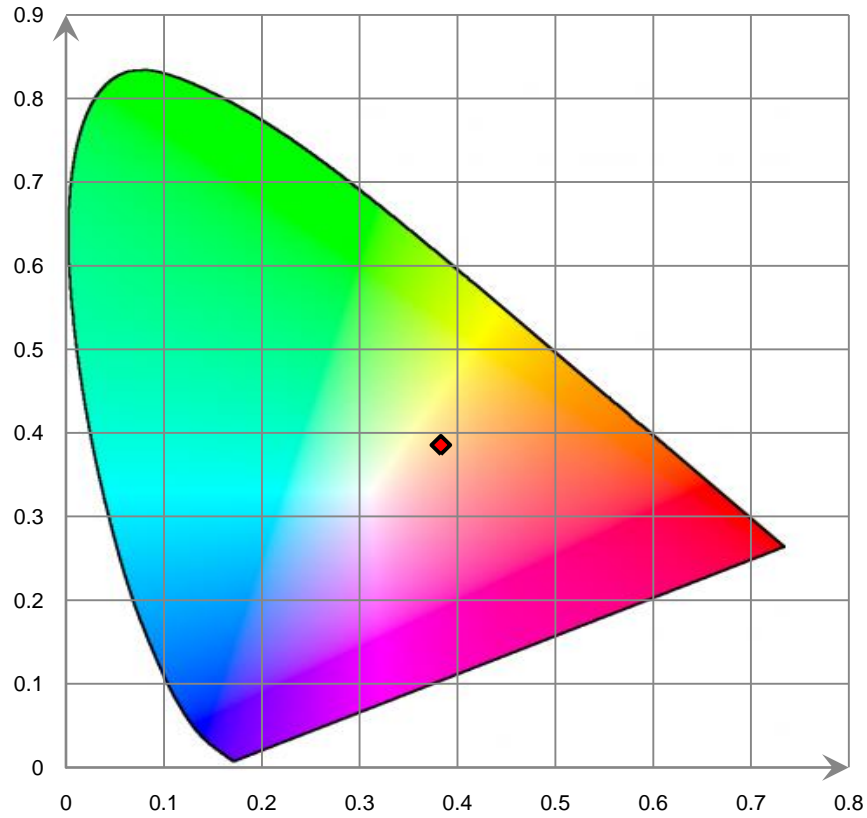
Relative Spectral Power Distribution



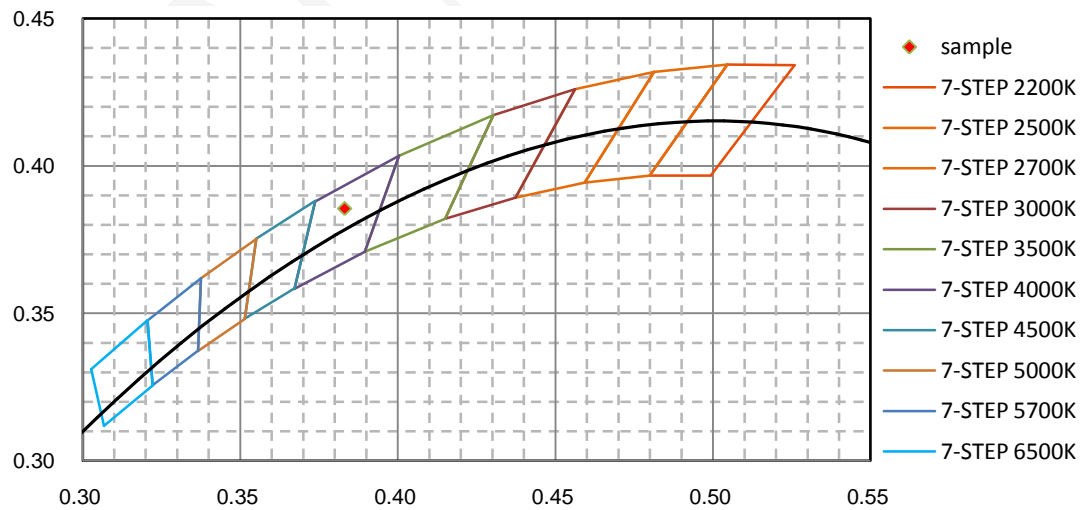
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	8.863E+00	421	1.899E+01	462	2.418E+02	503	2.282E+02	544	3.359E+02
381	8.539E+00	422	2.204E+01	463	2.331E+02	504	2.337E+02	545	3.380E+02
382	6.473E+00	423	2.408E+01	464	2.250E+02	505	2.391E+02	546	3.393E+02
383	7.116E+00	424	2.743E+01	465	2.171E+02	506	2.444E+02	547	3.411E+02
384	6.567E+00	425	3.024E+01	466	2.077E+02	507	2.486E+02	548	3.431E+02
385	5.702E+00	426	3.455E+01	467	1.984E+02	508	2.528E+02	549	3.448E+02
386	4.245E+00	427	3.854E+01	468	1.879E+02	509	2.571E+02	550	3.471E+02
387	3.773E+00	428	4.344E+01	469	1.771E+02	510	2.612E+02	551	3.486E+02
388	3.029E+00	429	4.862E+01	470	1.660E+02	511	2.663E+02	552	3.507E+02
389	4.189E+00	430	5.442E+01	471	1.566E+02	512	2.692E+02	553	3.531E+02
390	3.737E+00	431	6.076E+01	472	1.476E+02	513	2.731E+02	554	3.554E+02
391	3.281E+00	432	6.897E+01	473	1.401E+02	514	2.765E+02	555	3.572E+02
392	3.297E+00	433	7.649E+01	474	1.338E+02	515	2.793E+02	556	3.600E+02
393	2.585E+00	434	8.580E+01	475	1.294E+02	516	2.826E+02	557	3.613E+02
394	2.703E+00	435	9.649E+01	476	1.268E+02	517	2.859E+02	558	3.635E+02
395	2.716E+00	436	1.083E+02	477	1.246E+02	518	2.878E+02	559	3.663E+02
396	2.622E+00	437	1.221E+02	478	1.242E+02	519	2.904E+02	560	3.680E+02
397	2.244E+00	438	1.380E+02	479	1.240E+02	520	2.941E+02	561	3.709E+02
398	2.572E+00	439	1.558E+02	480	1.246E+02	521	2.959E+02	562	3.727E+02
399	2.607E+00	440	1.777E+02	481	1.267E+02	522	2.976E+02	563	3.758E+02
400	2.435E+00	441	2.016E+02	482	1.279E+02	523	3.000E+02	564	3.771E+02
401	2.357E+00	442	2.291E+02	483	1.297E+02	524	3.017E+02	565	3.795E+02
402	2.718E+00	443	2.608E+02	484	1.313E+02	525	3.043E+02	566	3.823E+02
403	3.262E+00	444	2.937E+02	485	1.344E+02	526	3.057E+02	567	3.851E+02
404	3.001E+00	445	3.297E+02	486	1.368E+02	527	3.076E+02	568	3.865E+02
405	3.719E+00	446	3.663E+02	487	1.394E+02	528	3.092E+02	569	3.887E+02
406	3.787E+00	447	3.994E+02	488	1.434E+02	529	3.108E+02	570	3.910E+02
407	3.965E+00	448	4.291E+02	489	1.472E+02	530	3.132E+02	571	3.926E+02
408	4.116E+00	449	4.509E+02	490	1.516E+02	531	3.140E+02	572	3.949E+02
409	4.733E+00	450	4.643E+02	491	1.573E+02	532	3.158E+02	573	3.972E+02
410	5.264E+00	451	4.642E+02	492	1.620E+02	533	3.173E+02	574	3.988E+02
411	5.462E+00	452	4.547E+02	493	1.674E+02	534	3.183E+02	575	3.997E+02
412	6.386E+00	453	4.353E+02	494	1.740E+02	535	3.200E+02	576	4.031E+02
413	7.450E+00	454	4.097E+02	495	1.794E+02	536	3.219E+02	577	4.036E+02
414	8.315E+00	455	3.802E+02	496	1.864E+02	537	3.238E+02	578	4.065E+02
415	9.166E+00	456	3.497E+02	497	1.929E+02	538	3.249E+02	579	4.077E+02
416	1.035E+01	457	3.221E+02	498	1.994E+02	539	3.273E+02	580	4.098E+02
417	1.192E+01	458	2.968E+02	499	2.050E+02	540	3.283E+02	581	4.108E+02
418	1.354E+01	459	2.789E+02	500	2.111E+02	541	3.309E+02	582	4.124E+02
419	1.530E+01	460	2.636E+02	501	2.171E+02	542	3.319E+02	583	4.140E+02
420	1.710E+01	461	2.516E+02	502	2.220E+02	543	3.329E+02	584	4.153E+02

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	4.169E+02	626	3.441E+02	667	1.466E+02	708	4.365E+01	749	1.252E+01
586	4.176E+02	627	3.404E+02	668	1.428E+02	709	4.248E+01	750	1.224E+01
587	4.186E+02	628	3.348E+02	669	1.391E+02	710	4.100E+01	751	1.191E+01
588	4.209E+02	629	3.303E+02	670	1.354E+02	711	3.971E+01	752	1.159E+01
589	4.220E+02	630	3.249E+02	671	1.316E+02	712	3.829E+01	753	1.126E+01
590	4.227E+02	631	3.203E+02	672	1.282E+02	713	3.704E+01	754	1.091E+01
591	4.230E+02	632	3.150E+02	673	1.245E+02	714	3.628E+01	755	1.055E+01
592	4.239E+02	633	3.096E+02	674	1.209E+02	715	3.504E+01	756	1.015E+01
593	4.233E+02	634	3.044E+02	675	1.173E+02	716	3.384E+01	757	1.014E+01
594	4.227E+02	635	3.000E+02	676	1.144E+02	717	3.304E+01	758	9.797E+00
595	4.229E+02	636	2.946E+02	677	1.113E+02	718	3.191E+01	759	9.689E+00
596	4.226E+02	637	2.894E+02	678	1.084E+02	719	3.088E+01	760	9.256E+00
597	4.219E+02	638	2.840E+02	679	1.047E+02	720	3.012E+01	761	9.080E+00
598	4.215E+02	639	2.789E+02	680	1.020E+02	721	2.898E+01	762	8.886E+00
599	4.207E+02	640	2.742E+02	681	9.887E+01	722	2.819E+01	763	8.638E+00
600	4.198E+02	641	2.688E+02	682	9.644E+01	723	2.737E+01	764	8.479E+00
601	4.194E+02	642	2.639E+02	683	9.392E+01	724	2.636E+01	765	8.178E+00
602	4.183E+02	643	2.584E+02	684	9.094E+01	725	2.560E+01	766	8.084E+00
603	4.172E+02	644	2.539E+02	685	8.797E+01	726	2.490E+01	767	7.816E+00
604	4.159E+02	645	2.481E+02	686	8.592E+01	727	2.406E+01	768	7.571E+00
605	4.135E+02	646	2.432E+02	687	8.318E+01	728	2.330E+01	769	7.318E+00
606	4.126E+02	647	2.379E+02	688	8.054E+01	729	2.279E+01	770	7.213E+00
607	4.106E+02	648	2.331E+02	689	7.829E+01	730	2.192E+01	771	7.063E+00
608	4.086E+02	649	2.283E+02	690	7.613E+01	731	2.139E+01	772	6.869E+00
609	4.067E+02	650	2.230E+02	691	7.356E+01	732	2.075E+01	773	6.664E+00
610	4.037E+02	651	2.178E+02	692	7.124E+01	733	2.011E+01	774	6.654E+00
611	4.009E+02	652	2.129E+02	693	6.936E+01	734	1.952E+01	775	6.390E+00
612	3.988E+02	653	2.084E+02	694	6.711E+01	735	1.911E+01	776	6.308E+00
613	3.955E+02	654	2.032E+02	695	6.502E+01	736	1.847E+01	777	5.943E+00
614	3.923E+02	655	1.989E+02	696	6.323E+01	737	1.792E+01	778	6.001E+00
615	3.894E+02	656	1.939E+02	697	6.145E+01	738	1.735E+01	779	5.934E+00
616	3.861E+02	657	1.893E+02	698	5.977E+01	739	1.658E+01	780	5.945E+00
617	3.820E+02	658	1.846E+02	699	5.779E+01	740	1.646E+01		
618	3.785E+02	659	1.801E+02	700	5.575E+01	741	1.586E+01		
619	3.741E+02	660	1.757E+02	701	5.444E+01	742	1.533E+01		
620	3.701E+02	661	1.711E+02	702	5.274E+01	743	1.493E+01		
621	3.665E+02	662	1.673E+02	703	5.118E+01	744	1.471E+01		
622	3.628E+02	663	1.625E+02	704	4.938E+01	745	1.412E+01		
623	3.576E+02	664	1.591E+02	705	4.820E+01	746	1.364E+01		
624	3.538E+02	665	1.544E+02	706	4.633E+01	747	1.327E+01		
625	3.492E+02	666	1.508E+02	707	4.509E+01	748	1.281E+01		

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**

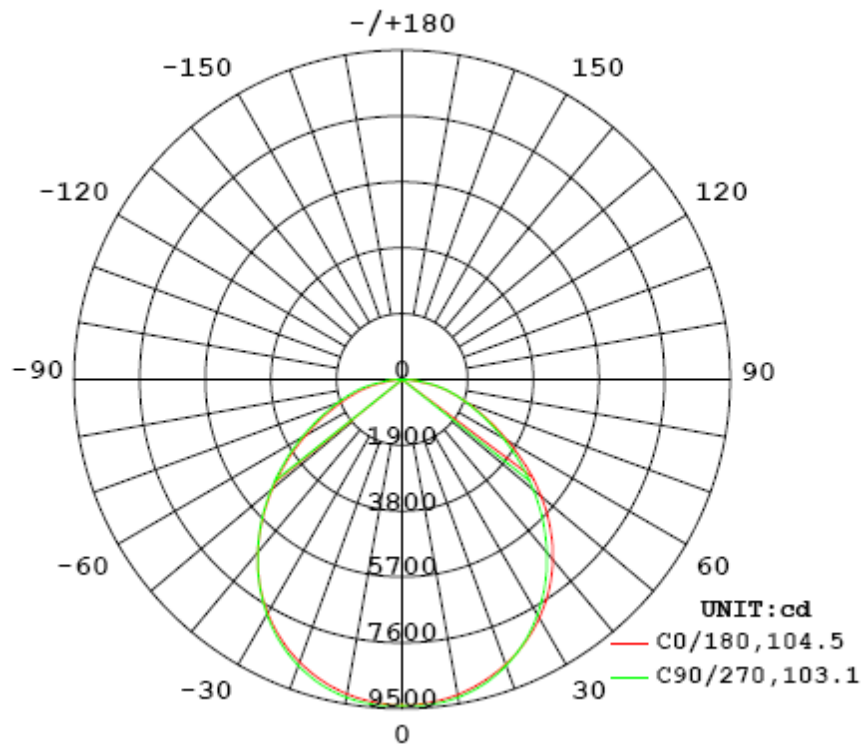
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	1.5130	180.8	0.9957

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
24888.7	137.65	9418.0	1.26	1.24

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	104.5	104.8	103.1	104.8	104.3
Field Angle (10% I _{max}):	157.2	161.2	159.8	161.2	159.9

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	9395	9395	9395	9395	9395	9395	9395	9395
5.0°	9349	9376	9397	9410	9410	9403	9394	9381
10.0°	9215	9268	9299	9317	9315	9304	9293	9276
15.0°	8993	9070	9103	9113	9109	9096	9093	9085
20.0°	8681	8776	8803	8797	8790	8780	8797	8809
25.0°	8282	8389	8401	8379	8366	8365	8408	8445
30.0°	7787	7906	7898	7853	7836	7846	7930	7995
35.0°	7196	7326	7302	7233	7214	7235	7357	7454
40.0°	6508	6647	6614	6534	6513	6548	6703	6820
45.0°	5735	5886	5852	5768	5759	5806	5977	6104
50.0°	4910	5055	5030	4958	4960	5017	5189	5310
55.0°	4057	4199	4183	4144	4152	4208	4355	4454
60.0°	3240	3362	3357	3346	3373	3425	3534	3582
65.0°	2490	2586	2585	2604	2637	2682	2757	2773
70.0°	1823	1907	1925	1967	2008	2043	2075	2076
75.0°	1275	1357	1387	1436	1476	1515	1525	1513
80.0°	640	871	946	929	928	993	1072	1031
85.0°	116	417	413	472	355	507	506	552
90.0°	23	39	50	49	50	62	60	53
95.0°	2	2	3	4	4	5	4	2
100.0°	2	2	2	2	2	2	2	2
105.0°	2	2	2	2	2	2	2	2
110.0°	2	2	2	2	2	2	2	2
115.0°	3	2	2	2	2	2	2	2
120.0°	3	3	3	3	3	3	3	3
125.0°	3	3	3	3	3	3	3	3
130.0°	4	4	4	4	4	4	4	4
135.0°	5	5	5	5	5	5	5	5
140.0°	6	6	6	6	6	6	6	6
145.0°	8	8	8	8	8	8	8	8
150.0°	10	10	10	10	10	10	10	10
155.0°	11	11	11	12	12	12	11	11
160.0°	12	12	12	13	13	13	12	12
165.0°	12	12	13	13	13	13	12	12
170.0°	12	12	12	13	13	12	12	12
175.0°	12	12	12	12	12	12	12	12
180.0°	11	11	11	11	11	11	11	11

Luminous Intensity (cd) Distribution Data (cont.)

C \ Y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	9395	9395	9395	9395	9395	9395	9395	9395
5.0°	9357	9381	9394	9403	9410	9410	9397	9376
10.0°	9236	9276	9293	9304	9315	9317	9299	9268
15.0°	9031	9085	9093	9096	9109	9113	9103	9070
20.0°	8750	8809	8797	8780	8790	8797	8803	8776
25.0°	8389	8445	8408	8365	8366	8379	8401	8389
30.0°	7944	7995	7930	7846	7836	7853	7898	7906
35.0°	7413	7454	7357	7235	7214	7233	7302	7326
40.0°	6787	6820	6703	6548	6513	6534	6614	6647
45.0°	6068	6104	5977	5806	5759	5768	5852	5886
50.0°	5263	5310	5189	5017	4960	4958	5030	5055
55.0°	4389	4454	4355	4208	4152	4144	4183	4199
60.0°	3516	3582	3534	3425	3373	3346	3357	3362
65.0°	2717	2773	2757	2682	2637	2604	2585	2586
70.0°	2032	2076	2075	2043	2008	1967	1925	1907
75.0°	1457	1513	1525	1515	1476	1436	1387	1357
80.0°	849	1031	1072	993	928	929	946	871
85.0°	190	552	506	507	355	472	413	417
90.0°	18	53	60	62	50	49	50	39
95.0°	1	2	4	5	4	4	3	2
100.0°	1	2	2	2	2	2	2	2
105.0°	1	2	2	2	2	2	2	2
110.0°	2	2	2	2	2	2	2	2
115.0°	2	2	2	2	2	2	2	2
120.0°	3	3	3	3	3	3	3	3
125.0°	3	3	3	3	3	3	3	3
130.0°	4	4	4	4	4	4	4	4
135.0°	4	5	5	5	5	5	5	5
140.0°	5	6	6	6	6	6	6	6
145.0°	5	8	8	8	8	8	8	8
150.0°	6	10	10	10	10	10	10	10
155.0°	7	11	11	12	12	12	11	11
160.0°	8	12	12	13	13	13	12	12
165.0°	8	12	12	13	13	13	13	12
170.0°	9	12	12	12	13	13	12	12
175.0°	10	12	12	12	12	12	12	12
180.0°	11	11	11	11	11	11	11	11

Zonal Lumen Density Measurement

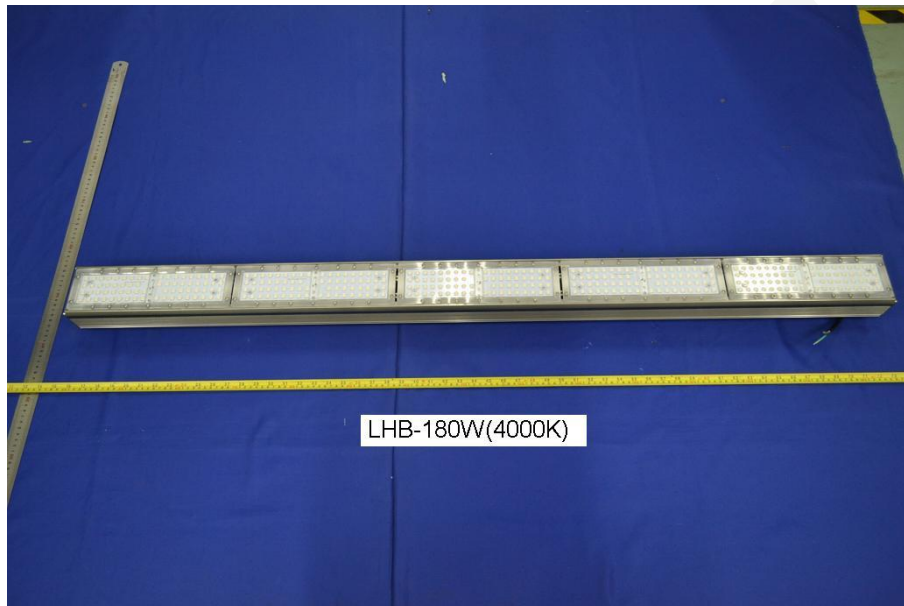
Deg	Flux (lm)	%
0-5	224.8	0.90
5-10	668.4	2.69
10-15	1090.0	4.38
15-20	1472.8	5.92
20-25	1801.0	7.23
25-30	2060.1	8.28
30-35	2237.7	8.99
35-40	2324.5	9.34
40-45	2316.5	9.31
45-50	2213.3	8.89
50-55	2023.7	8.13
55-60	1767.5	7.10
60-65	1471.2	5.91
65-70	1170.3	4.71
70-75	892.8	3.58
75-80	642.2	2.58
80-85	363.5	1.46
85-90	112.7	0.46
90-95	8.8	0.03
95-100	1.3	0.01
100-105	1.0	0.00
105-110	1.1	0.01
110-115	1.1	0.00
115-120	1.2	0.00
120-125	1.3	0.01
125-130	1.5	0.01
130-135	1.8	0.00
135-140	2.0	0.01
140-145	2.3	0.01
145-150	2.6	0.01
150-155	2.6	0.01
155-160	2.4	0.01
160-165	2.0	0.01
165-170	1.4	0.01
170-175	0.8	0.00
175-180	0.3	0.00

Deg	Flux (lm)	%
0-5	224.8	0.90
0-10	893.1	3.59
0-15	1983.1	7.97
0-20	3455.9	13.89
0-25	5256.9	21.12
0-30	7317.1	29.40
0-35	9554.7	38.39
0-40	11879.2	47.73
0-45	14195.7	57.04
0-50	16409.0	65.93
0-55	18432.8	74.06
0-60	20200.3	81.16
0-65	21671.5	87.07
0-70	22841.8	91.78
0-75	23734.6	95.36
0-80	24376.8	97.94
0-85	24740.3	99.40
0-90	24853.0	99.86
0-95	24861.8	99.89
0-100	24863.0	99.90
0-105	24864.0	99.90
0-110	24865.1	99.91
0-115	24866.2	99.91
0-120	24867.4	99.91
0-125	24868.8	99.92
0-130	24870.3	99.93
0-135	24872.1	99.93
0-140	24874.1	99.94
0-145	24876.4	99.95
0-150	24879.0	99.96
0-155	24881.7	99.97
0-160	24884.1	99.98
0-165	24886.1	99.99
0-170	24887.6	100.00
0-175	24888.4	100.00
0-180	24888.7	100.00

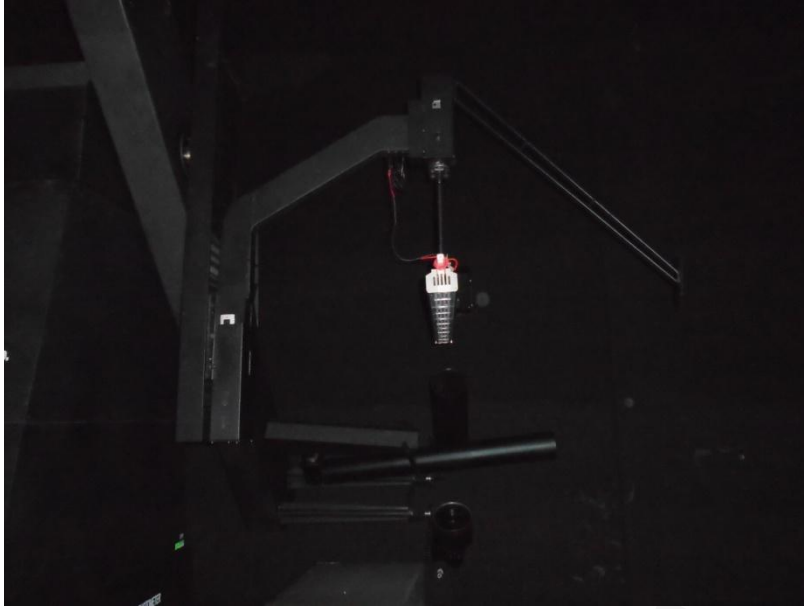
[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Power Factor:	277.0	60	0.9423
Total Harmonic Distortion:	277.0	60	11.36%
Total Harmonic Distortion:	120.0	60	6.44%
Total Harmonic Distortion:	100.0	60	6.42%
Power Factor:	100.0	60	0.9988

6. Product Photo



7. Product Test orientation in the Goniophotometer



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

FINAL