



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: TBHBR12-200W(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:	RSZ170412515-10
Test Date:	2017-04-20 to 2017-04-21
Report Date:	2017-05-04
Reviewed By:	Blake Zhang / EE Engineer <i>Blake Zhang</i>
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.

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 2017-04-12 and used for testing.

Model Tested: TBHBR12-200W(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: 200 W
 Nominal CCT: 4000K
 Nominal Lumen Output: 26000lm

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	M112048CA1361125	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 64710010 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	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_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**

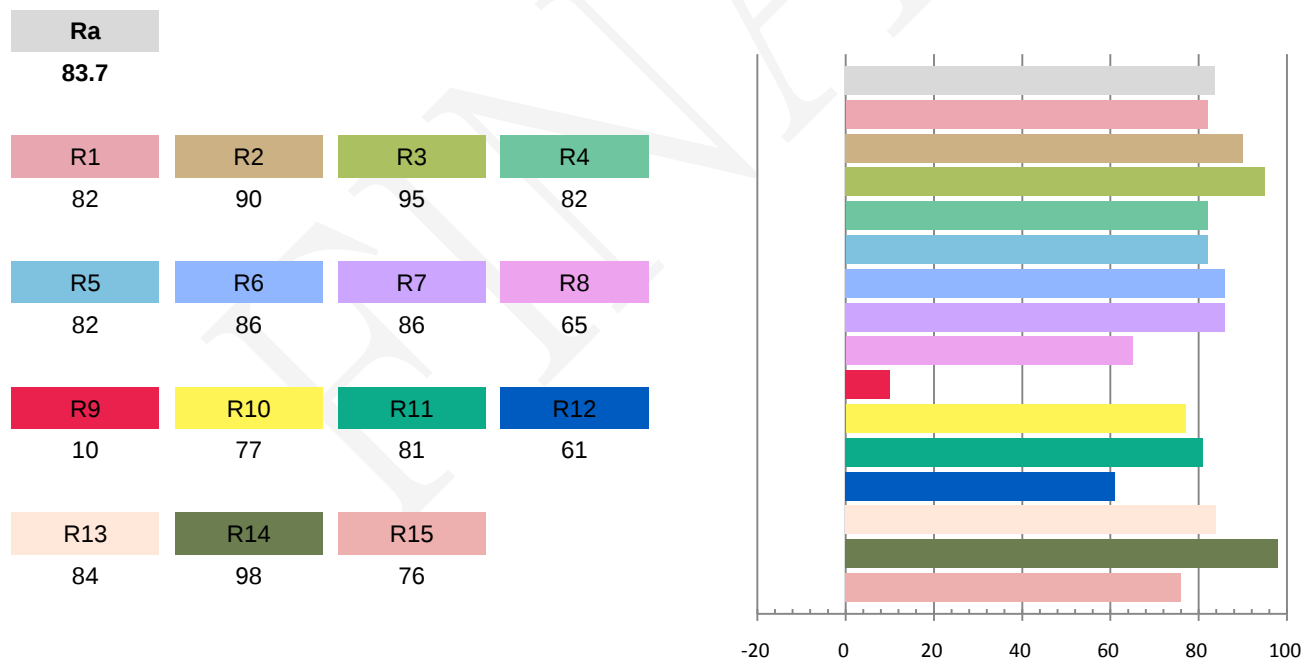
Test orientation: **Downward**

Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
119.9	60	1.716	204.9	0.9958	27172	132.6

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
82.818	4170	0.000393	0.3734	0.3731	0.2219	0.4989

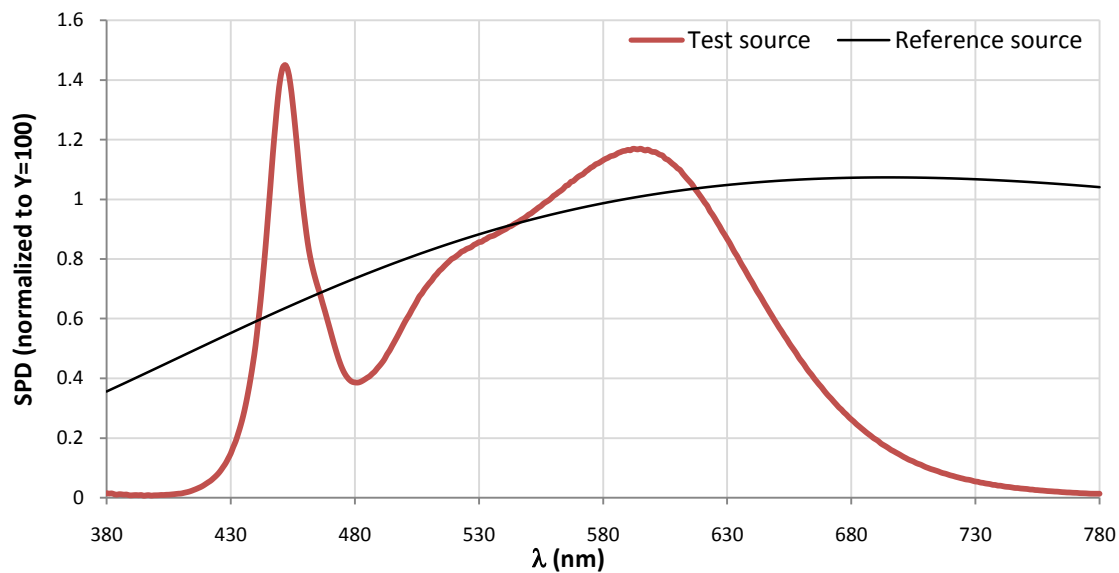
Color Rendering Index



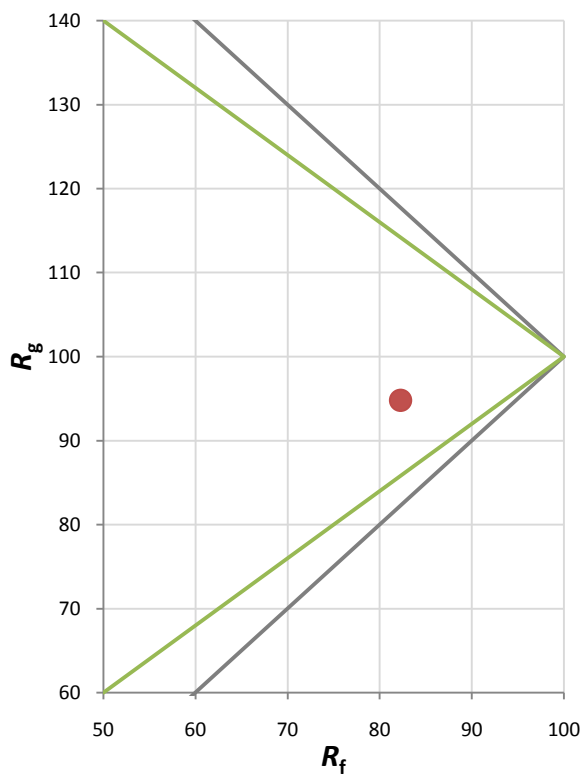
Fidelity Index and Gamut Index

Fidelity Index R_f	82
Gamut Index R_g	95

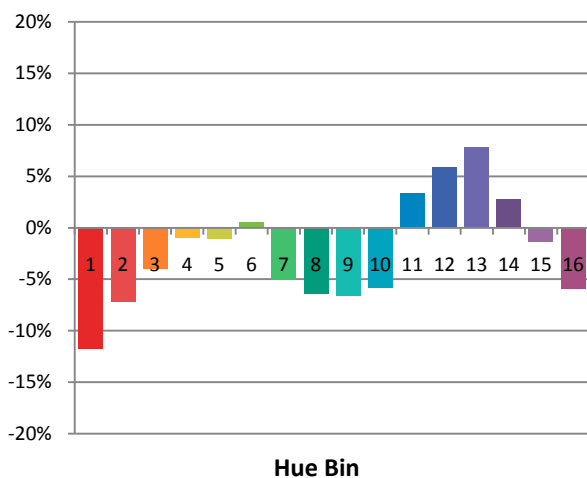
Spectral Power Distribution Comparison



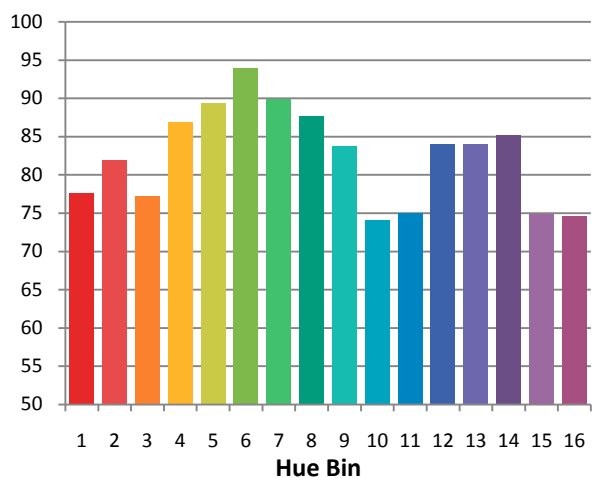
Plot of R_g versus R_f



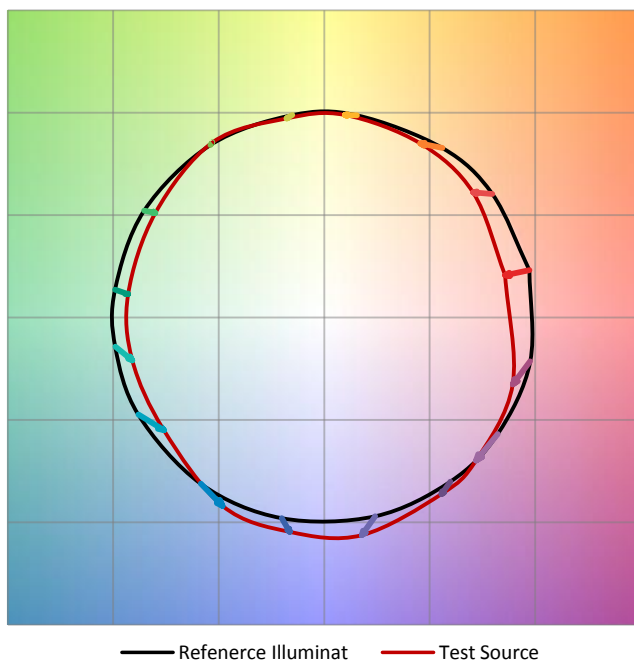
Chroma Shift by Hue



R_f by Hue

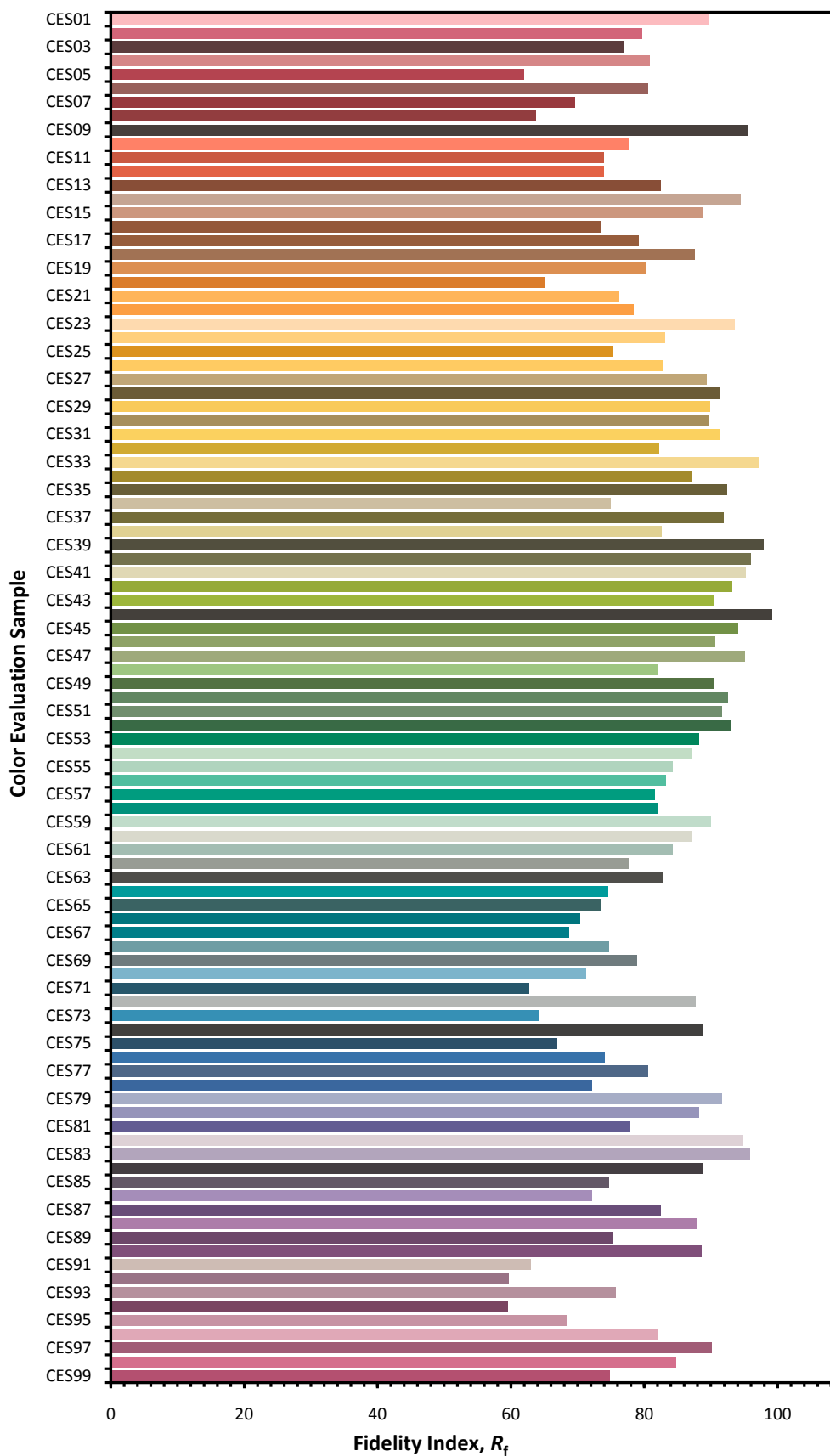


Color Vector Graphic

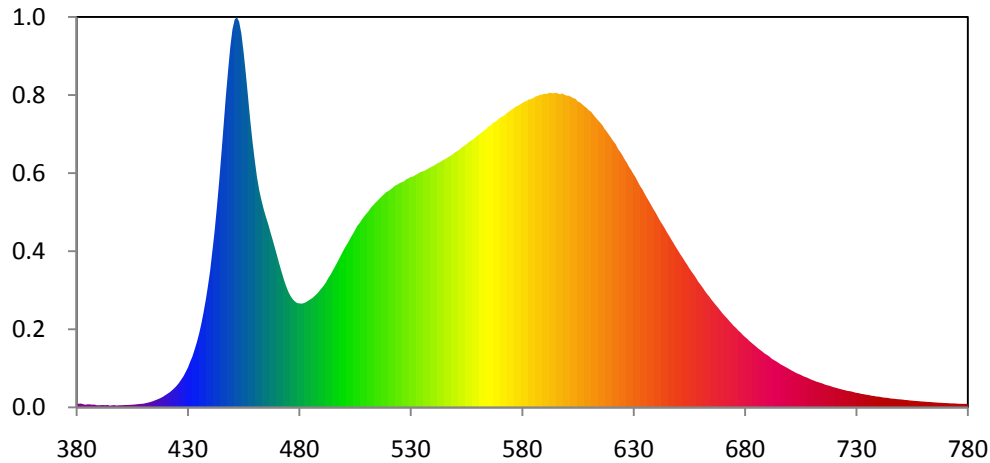


— Reference Illuminat — Test Source

Color Fidelity by CES Sample



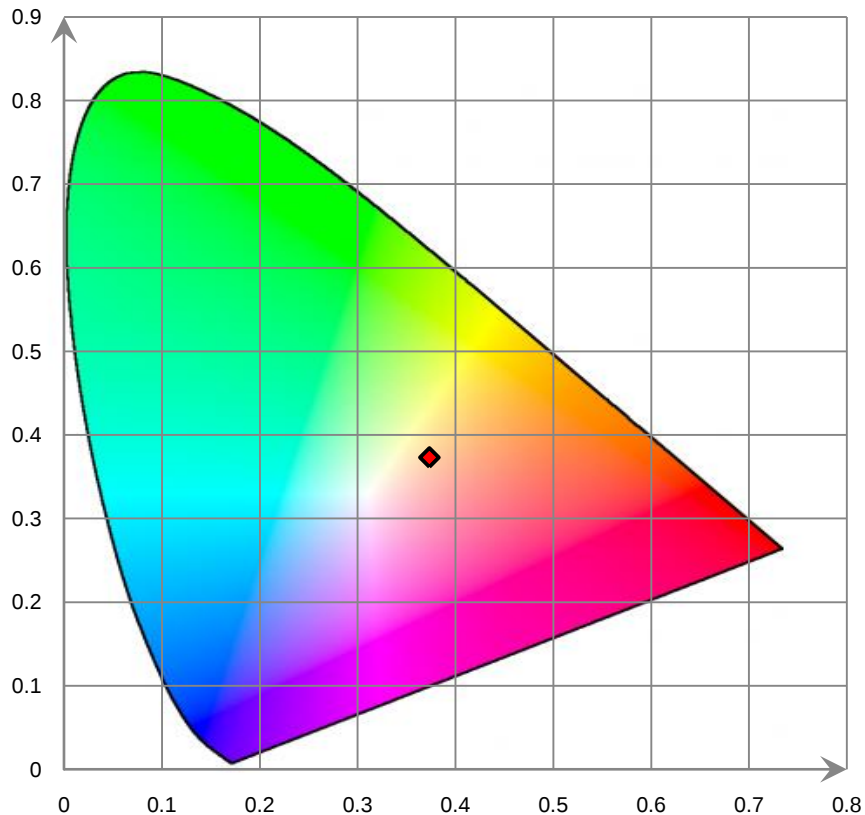
Relative Spectral Power Distribution



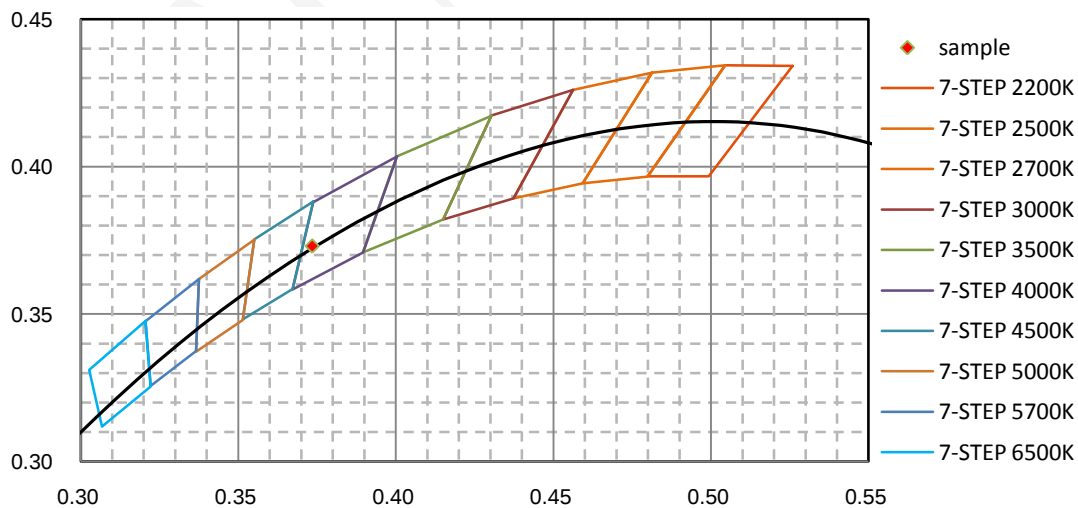
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	5.977E+00	421	2.056E+01	462	3.210E+02	503	2.505E+02	544	3.643E+02
381	5.367E+00	422	2.275E+01	463	3.060E+02	504	2.561E+02	545	3.662E+02
382	5.678E+00	423	2.565E+01	464	2.930E+02	505	2.620E+02	546	3.680E+02
383	4.686E+00	424	2.868E+01	465	2.816E+02	506	2.682E+02	547	3.703E+02
384	3.937E+00	425	3.214E+01	466	2.711E+02	507	2.721E+02	548	3.721E+02
385	4.563E+00	426	3.627E+01	467	2.593E+02	508	2.774E+02	549	3.744E+02
386	4.425E+00	427	4.110E+01	468	2.480E+02	509	2.817E+02	550	3.772E+02
387	3.956E+00	428	4.598E+01	469	2.361E+02	510	2.859E+02	551	3.789E+02
388	4.191E+00	429	5.226E+01	470	2.243E+02	511	2.896E+02	552	3.816E+02
389	3.250E+00	430	5.875E+01	471	2.122E+02	512	2.945E+02	553	3.841E+02
390	3.059E+00	431	6.735E+01	472	2.006E+02	513	2.980E+02	554	3.867E+02
391	3.347E+00	432	7.516E+01	473	1.897E+02	514	3.021E+02	555	3.888E+02
392	3.449E+00	433	8.536E+01	474	1.798E+02	515	3.050E+02	556	3.919E+02
393	3.183E+00	434	9.626E+01	475	1.714E+02	516	3.085E+02	557	3.941E+02
394	3.523E+00	435	1.087E+02	476	1.649E+02	517	3.118E+02	558	3.961E+02
395	2.514E+00	436	1.233E+02	477	1.601E+02	518	3.149E+02	559	3.987E+02
396	3.093E+00	437	1.401E+02	478	1.565E+02	519	3.181E+02	560	4.021E+02
397	3.320E+00	438	1.587E+02	479	1.543E+02	520	3.198E+02	561	4.042E+02
398	2.684E+00	439	1.796E+02	480	1.536E+02	521	3.222E+02	562	4.069E+02
399	3.088E+00	440	2.028E+02	481	1.533E+02	522	3.248E+02	563	4.091E+02
400	3.164E+00	441	2.316E+02	482	1.540E+02	523	3.278E+02	564	4.119E+02
401	3.274E+00	442	2.614E+02	483	1.556E+02	524	3.292E+02	565	4.156E+02
402	3.573E+00	443	2.962E+02	484	1.576E+02	525	3.314E+02	566	4.169E+02
403	3.517E+00	444	3.332E+02	485	1.598E+02	526	3.327E+02	567	4.208E+02
404	3.827E+00	445	3.742E+02	486	1.619E+02	527	3.342E+02	568	4.220E+02
405	3.902E+00	446	4.159E+02	487	1.651E+02	528	3.370E+02	569	4.250E+02
406	4.221E+00	447	4.591E+02	488	1.680E+02	529	3.385E+02	570	4.278E+02
407	4.542E+00	448	4.969E+02	489	1.722E+02	530	3.406E+02	571	4.297E+02
408	4.924E+00	449	5.324E+02	490	1.760E+02	531	3.410E+02	572	4.314E+02
409	5.275E+00	450	5.587E+02	491	1.801E+02	532	3.433E+02	573	4.346E+02
410	5.495E+00	451	5.735E+02	492	1.849E+02	533	3.449E+02	574	4.369E+02
411	6.246E+00	452	5.766E+02	493	1.911E+02	534	3.472E+02	575	4.397E+02
412	6.979E+00	453	5.698E+02	494	1.960E+02	535	3.484E+02	576	4.415E+02
413	7.763E+00	454	5.520E+02	495	2.021E+02	536	3.494E+02	577	4.443E+02
414	8.791E+00	455	5.247E+02	496	2.080E+02	537	3.513E+02	578	4.456E+02
415	1.008E+01	456	4.929E+02	497	2.141E+02	538	3.531E+02	579	4.475E+02
416	1.137E+01	457	4.583E+02	498	2.204E+02	539	3.550E+02	580	4.497E+02
417	1.282E+01	458	4.234E+02	499	2.268E+02	540	3.567E+02	581	4.516E+02
418	1.428E+01	459	3.925E+02	500	2.332E+02	541	3.584E+02	582	4.530E+02
419	1.618E+01	460	3.651E+02	501	2.389E+02	542	3.608E+02	583	4.550E+02
420	1.836E+01	461	3.403E+02	502	2.442E+02	543	3.621E+02	584	4.558E+02

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	4.571E+02	626	3.668E+02	667	1.509E+02	708	4.388E+01	749	1.199E+01
586	4.593E+02	627	3.615E+02	668	1.472E+02	709	4.221E+01	750	1.171E+01
587	4.605E+02	628	3.554E+02	669	1.428E+02	710	4.067E+01	751	1.143E+01
588	4.619E+02	629	3.504E+02	670	1.387E+02	711	3.946E+01	752	1.084E+01
589	4.624E+02	630	3.448E+02	671	1.350E+02	712	3.816E+01	753	1.073E+01
590	4.636E+02	631	3.394E+02	672	1.316E+02	713	3.718E+01	754	1.017E+01
591	4.630E+02	632	3.331E+02	673	1.277E+02	714	3.610E+01	755	9.997E+00
592	4.650E+02	633	3.270E+02	674	1.241E+02	715	3.504E+01	756	9.650E+00
593	4.647E+02	634	3.220E+02	675	1.203E+02	716	3.365E+01	757	9.443E+00
594	4.641E+02	635	3.157E+02	676	1.174E+02	717	3.260E+01	758	9.114E+00
595	4.652E+02	636	3.098E+02	677	1.137E+02	718	3.184E+01	759	8.780E+00
596	4.640E+02	637	3.044E+02	678	1.108E+02	719	3.072E+01	760	8.599E+00
597	4.627E+02	638	2.985E+02	679	1.072E+02	720	2.962E+01	761	8.378E+00
598	4.639E+02	639	2.926E+02	680	1.042E+02	721	2.887E+01	762	8.103E+00
599	4.622E+02	640	2.873E+02	681	1.014E+02	722	2.783E+01	763	8.004E+00
600	4.608E+02	641	2.813E+02	682	9.812E+01	723	2.697E+01	764	7.646E+00
601	4.607E+02	642	2.753E+02	683	9.537E+01	724	2.609E+01	765	7.317E+00
602	4.588E+02	643	2.702E+02	684	9.256E+01	725	2.530E+01	766	7.133E+00
603	4.570E+02	644	2.647E+02	685	8.985E+01	726	2.437E+01	767	6.886E+00
604	4.560E+02	645	2.588E+02	686	8.700E+01	727	2.394E+01	768	6.832E+00
605	4.520E+02	646	2.534E+02	687	8.450E+01	728	2.336E+01	769	6.553E+00
606	4.506E+02	647	2.478E+02	688	8.201E+01	729	2.232E+01	770	6.433E+00
607	4.479E+02	648	2.425E+02	689	7.926E+01	730	2.146E+01	771	6.317E+00
608	4.449E+02	649	2.369E+02	690	7.732E+01	731	2.113E+01	772	5.944E+00
609	4.424E+02	650	2.317E+02	691	7.500E+01	732	2.010E+01	773	5.865E+00
610	4.390E+02	651	2.263E+02	692	7.205E+01	733	1.971E+01	774	5.754E+00
611	4.369E+02	652	2.215E+02	693	7.002E+01	734	1.893E+01	775	5.585E+00
612	4.323E+02	653	2.160E+02	694	6.811E+01	735	1.849E+01	776	5.313E+00
613	4.283E+02	654	2.113E+02	695	6.595E+01	736	1.798E+01	777	5.251E+00
614	4.245E+02	655	2.058E+02	696	6.367E+01	737	1.704E+01	778	5.211E+00
615	4.209E+02	656	2.010E+02	697	6.194E+01	738	1.689E+01	779	5.221E+00
616	4.170E+02	657	1.964E+02	698	6.005E+01	739	1.601E+01	780	5.231E+00
617	4.117E+02	658	1.915E+02	699	5.829E+01	740	1.593E+01		
618	4.074E+02	659	1.860E+02	700	5.638E+01	741	1.527E+01		
619	4.028E+02	660	1.817E+02	701	5.437E+01	742	1.461E+01		
620	3.981E+02	661	1.773E+02	702	5.267E+01	743	1.433E+01		
621	3.931E+02	662	1.722E+02	703	5.085E+01	744	1.401E+01		
622	3.889E+02	663	1.677E+02	704	4.946E+01	745	1.341E+01		
623	3.823E+02	664	1.638E+02	705	4.816E+01	746	1.287E+01		
624	3.777E+02	665	1.591E+02	706	4.634E+01	747	1.277E+01		
625	3.725E+02	666	1.550E+02	707	4.500E+01	748	1.229E+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**

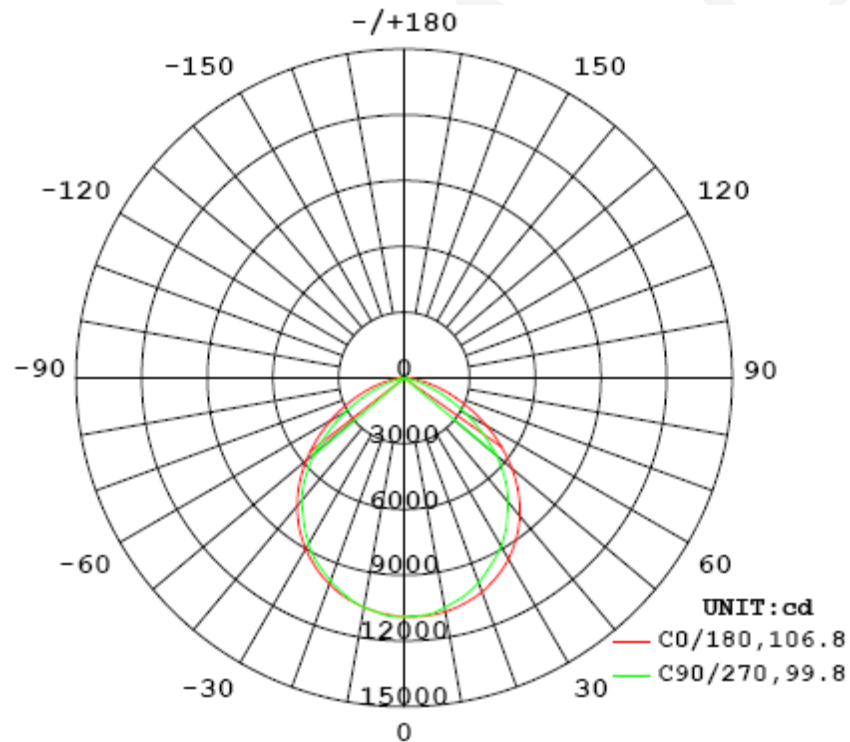
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.1	60	1.7110	204.6	0.9958

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I _{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
27181.8	132.86	10936.0	1.30	1.22

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I _{max}):	106.8	105.6	99.8	105.2	104.4
Field Angle (10% I _{max}):	154.4	148.9	141.7	148.7	148.4

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	10891	10889	10884	10887	10886	10885	10890	10888
5.0°	10799	10826	10830	10822	10833	10861	10909	10926
10.0°	10626	10654	10583	10588	10620	10662	10733	10843
15.0°	10367	10353	10309	10275	10292	10382	10517	10620
20.0°	10008	9961	9900	9829	9854	9965	10156	10306
25.0°	9561	9525	9386	9317	9359	9479	9684	9930
30.0°	9017	8969	8783	8755	8752	8930	9122	9428
35.0°	8369	8290	8167	8039	8014	8222	8525	8774
40.0°	7624	7551	7427	7272	7295	7454	7783	8042
45.0°	6780	6719	6595	6464	6387	6642	6942	7206
50.0°	5854	5859	5754	5469	5356	5637	6081	6313
55.0°	4879	4960	4813	4370	4195	4510	5109	5371
60.0°	3897	4021	3807	3265	3078	3375	4046	4373
65.0°	2950	3089	2754	2228	2055	2304	2930	3376
70.0°	2080	2182	1768	1320	1167	1367	1885	2395
75.0°	1312	1331	916	580	465	596	978	1468
80.0°	665	581	265	142	125	144	290	654
85.0°	184	84	59	52	46	54	63	100
90.0°	16	6	1	1	1	1	6	4
95.0°	2	2	2	1	1	1	2	2
100.0°	2	2	2	2	2	2	2	2
105.0°	2	2	2	2	2	2	2	2
110.0°	3	3	3	3	2	3	3	2
115.0°	3	3	3	3	3	3	3	3
120.0°	3	3	3	3	3	3	3	3
125.0°	3	4	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	7	7	7	7	7	7	6
145.0°	8	8	9	9	9	9	9	8
150.0°	9	10	11	11	11	11	10	9
155.0°	10	11	12	12	13	12	12	10
160.0°	12	12	13	14	13	13	12	11
165.0°	12	12	12	13	13	13	12	12
170.0°	12	12	12	12	12	12	12	11
175.0°	11	11	11	11	11	11	11	11
180.0°	11	10	10	9	10	10	10	10

Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	10891	10889	10884	10887	10886	10885	10890	10888
5.0°	10902	10885	10882	10870	10855	10833	10820	10797
10.0°	10828	10830	10792	10702	10637	10624	10657	10647
15.0°	10654	10663	10518	10412	10347	10302	10317	10397
20.0°	10392	10356	10184	10039	9933	9897	9939	10004
25.0°	10015	9926	9748	9540	9410	9375	9443	9514
30.0°	9536	9419	9194	9010	8863	8821	8842	8954
35.0°	8939	8815	8574	8363	8163	8164	8202	8317
40.0°	8222	8080	7877	7572	7386	7366	7488	7566
45.0°	7384	7260	7048	6764	6535	6559	6668	6753
50.0°	6430	6344	6164	5792	5517	5591	5801	5870
55.0°	5396	5389	5239	4695	4389	4513	4899	4966
60.0°	4336	4407	4188	3557	3249	3399	3896	4044
65.0°	3301	3407	3085	2461	2195	2349	2854	3113
70.0°	2340	2429	2015	1490	1288	1426	1855	2207
75.0°	1496	1515	1092	692	535	652	991	1375
80.0°	788	714	354	164	142	177	309	628
85.0°	242	153	74	64	56	62	69	129
90.0°	3	3	1	1	0	0	1	1
95.0°	1	1	1	1	1	1	1	1
100.0°	1	1	1	1	1	1	1	1
105.0°	1	1	1	1	1	1	1	1
110.0°	2	2	2	2	2	2	2	2
115.0°	2	2	2	2	2	2	2	2
120.0°	3	2	2	2	2	2	2	2
125.0°	3	3	3	3	3	3	3	3
130.0°	4	4	4	3	3	3	3	4
135.0°	4	4	4	4	4	4	4	4
140.0°	5	5	5	5	5	5	5	5
145.0°	5	5	6	6	6	6	6	6
150.0°	6	6	6	7	7	7	6	6
155.0°	7	6	7	7	7	8	7	8
160.0°	8	8	7	7	8	8	8	8
165.0°	8	8	7	8	8	8	8	8
170.0°	9	9	8	8	8	7	8	9
175.0°	10	10	9	8	8	8	9	9
180.0°	11	11	10	10	9	10	10	10

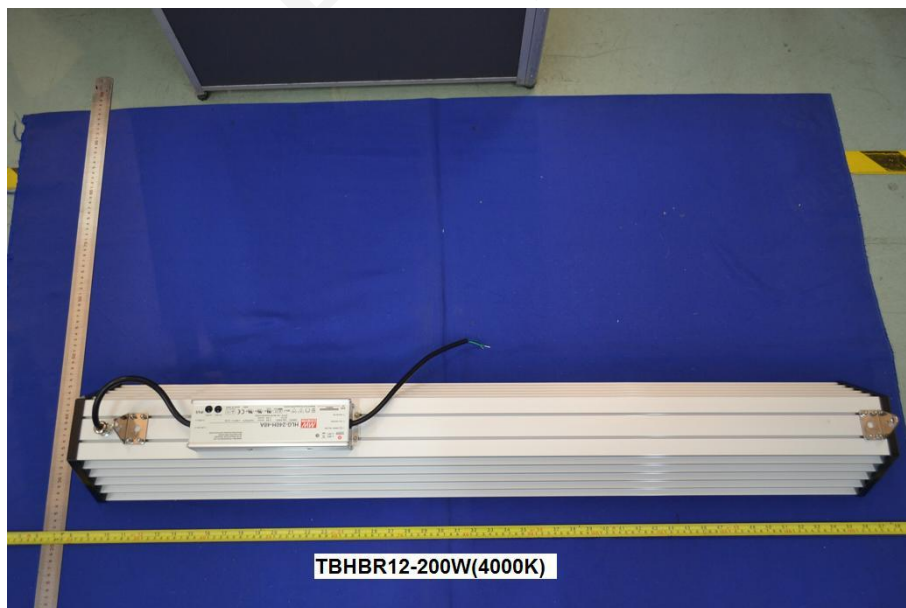
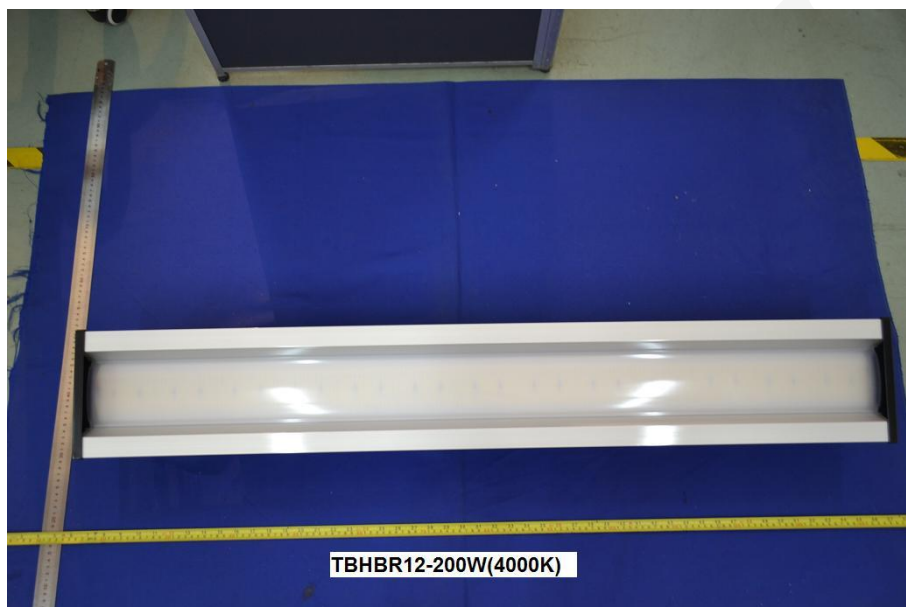
Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	260.0	0.96	0-5	260.0	0.96
5-10	770.7	2.83	0-10	1030.6	3.79
10-15	1252.1	4.61	0-15	2282.7	8.40
15-20	1686.7	6.20	0-20	3969.5	14.60
20-25	2057.9	7.57	0-25	6027.4	22.17
25-30	2354.4	8.67	0-30	8381.8	30.84
30-35	2561.9	9.42	0-35	10943.7	40.26
35-40	2668.0	9.82	0-40	13611.7	50.08
40-45	2671.1	9.82	0-45	16282.8	59.90
45-50	2557.5	9.41	0-50	18840.3	69.31
50-55	2331.6	8.58	0-55	21171.9	77.89
55-60	2000.6	7.36	0-60	23172.5	85.25
60-65	1597.1	5.88	0-65	24769.6	91.13
65-70	1160.1	4.26	0-70	25929.7	95.39
70-75	731.7	2.70	0-75	26661.4	98.09
75-80	356.1	1.31	0-80	27017.5	99.40
80-85	118.7	0.43	0-85	27136.1	99.83
85-90	21.1	0.08	0-90	27157.2	99.91
90-95	0.7	0.00	0-95	27157.8	99.91
95-100	0.8	0.00	0-100	27158.6	99.91
100-105	0.9	0.01	0-105	27159.5	99.92
105-110	1.0	0.00	0-110	27160.6	99.92
110-115	1.1	0.01	0-115	27161.7	99.93
115-120	1.2	0.00	0-120	27162.9	99.93
120-125	1.3	0.01	0-125	27164.2	99.94
125-130	1.5	0.00	0-130	27165.7	99.94
130-135	1.7	0.01	0-135	27167.4	99.95
135-140	1.9	0.00	0-140	27169.3	99.95
140-145	2.1	0.01	0-145	27171.5	99.96
145-150	2.3	0.01	0-150	27173.7	99.97
150-155	2.2	0.01	0-155	27176.0	99.98
155-160	2.1	0.01	0-160	27178.0	99.99
160-165	1.7	0.00	0-165	27179.7	99.99
165-170	1.2	0.01	0-170	27180.9	100.00
170-175	0.7	0.00	0-175	27181.6	100.00
175-180	0.2	0.00	0-180	27181.8	100.00

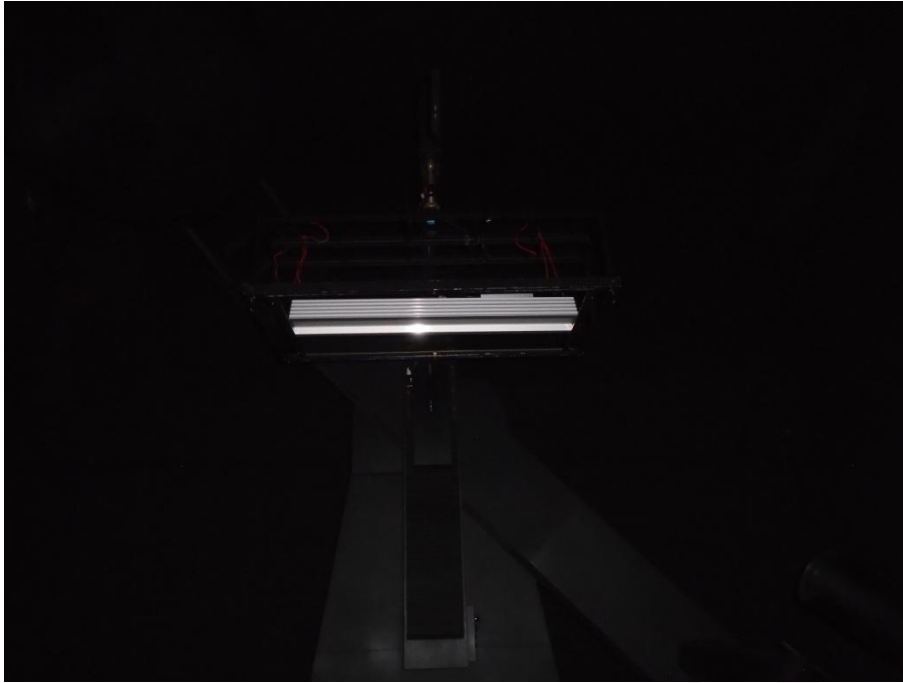
[Additional Test]

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Power Factor:	277.0	60	0.9221
Total Harmonic Distortion:	277.0	60	10.03%
Total Harmonic Distortion:	120.0	60	3.73%
Total Harmonic Distortion:	100.0	60	5.94%
Power Factor:	100.0	60	0.9964

6. Product Photo



7. Product Test orientation in the Goniophotometer



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