



# IES LM-79-08

## MEASUREMENT AND TEST REPORT

For

**P.Q.L., Inc.**

2285 Ward Avenue / Simi Valley, CA 93065

**Test Model: 93741**

<b>Report Type:</b>	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution, THD
<b>Test Engineer:</b>	Daniel Duan <i>Daniel Duan</i>
<b>Report Number:</b>	RKS160716005-10
<b>Test Date:</b>	2016-07-26
<b>Report Date:</b>	2016-07-30
<b>Reviewed By:</b>	Jeanne Han/EE Manager <i>Jeanne Han</i>
<b>Prepared By:</b>	Bay Area Compliance Laboratories Corp. (Dongguan). Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China. Tel: +86-0769-86858888 Fax: +86-0769-86858588
<b>Test Facility:</b>	Test facility was located at Pu Long Cun 69, Puxinghu Industrial Area, Tangxia Town, Dongguan, Guangdong, P.R.China.
<b>Accreditation:</b>	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 2016-07-16 and used for testing.

Model Tested: 93741  
 Manufacturer: P.Q.L., Inc.  
 Brand Name: Superior Life®  
 Product Designation: Linear Retrofit Kits for 2x4 Luminaires  
 Dimmable: Non- Dimmable  
 Burning Time Before Test: 0hour(For New Products)  
 Auxiliary Equipment: Lithonia 2GT8 lensed 2X4 Troffer

### Rated Values:

Rated Voltage/Frequency: 100-277VAC, 50/60Hz  
 Rated Power: 40W  
 Nominal CCT: 4000K  
 Nominal Lumen Output: 5200 lm (For Linear Retrofit Kit)  
 Nominal CRI: 80

## 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	2016-03-10	2017-03-09
Spectral photometer	SENSING	SPR3000	90902027	350nm~800nm	2016-03-10	2017-03-09
Power Meter	YOKOGAWA	WT-210	91j926132	15/30/60/150/300/600 V	2016-03-04	2017-03-03
AC Power Supply	ALL Power	APW-105N	970663	220V±10% 50HZ	2016-03-04	2017-03-03
Standard Light Source	EVERFINE	D204	01331191	24V/100W	2015-08-27	2016-08-26
Thermal Meter	SENSING	N/A	N/A	25、50°C	2016-03-10	2017-03-09
DC Power Supply	ITECH	IT6154	0061 0417 6471 0010 19	0~32V	2016-03-04	2017-03-03
AC Power Supply	EVERFINE	VPS1030 PWM	1012017	0-150V, 0-300V	2016-03-04	2017-03-03
DC Power Supply	EVERFINE	WY12010	1009009	30V/5A	2016-03-04	2017-03-03
Power Meter	YOKOGAWA	WT-210	91KB35700	15/30/60/150/300/600V	2016-03-04	2017-03-03
Goniophotometer	EVERFINE	GO-R5000	YG108492N10120001	1600mm,3000W/10A	2016-03-10	2017-03-09
Wireless Remote	N/A	433MHz	N/A	0°C~50°C;-20°C~60°C	2016-03-21	2017-03-20

Device	Manufacture	Model No	Serial No	Test Range	Calibration date	Calibration due date
Sensor						
Standard Light Source	EVERFINE	D908	1012003	N/A	2015-09-08	2016-09-07

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.

$4\pi$  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  $U=2.1\%$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=32\text{K}$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the CRI is  $U=2.1$  ( $K=2$ ), 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 ( $\gamma$ ) 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**

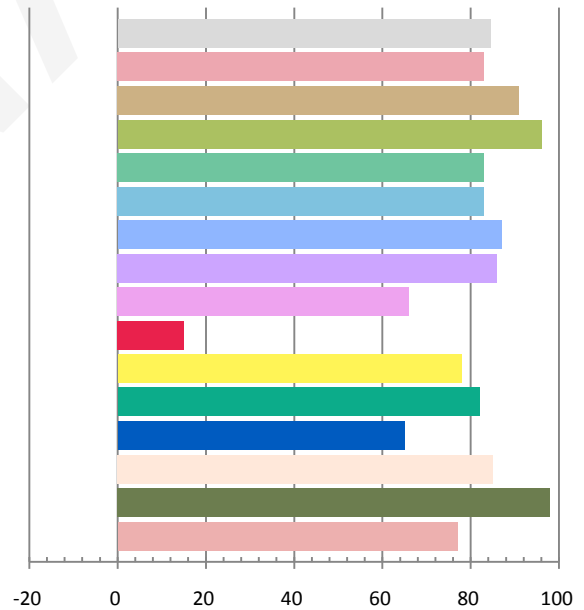
### Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.3449	41.06	0.9923	4012.7	97.72

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
12.268	3952	-0.00025	0.3824	0.3775	0.2261	0.5022

### Color Rendering Index

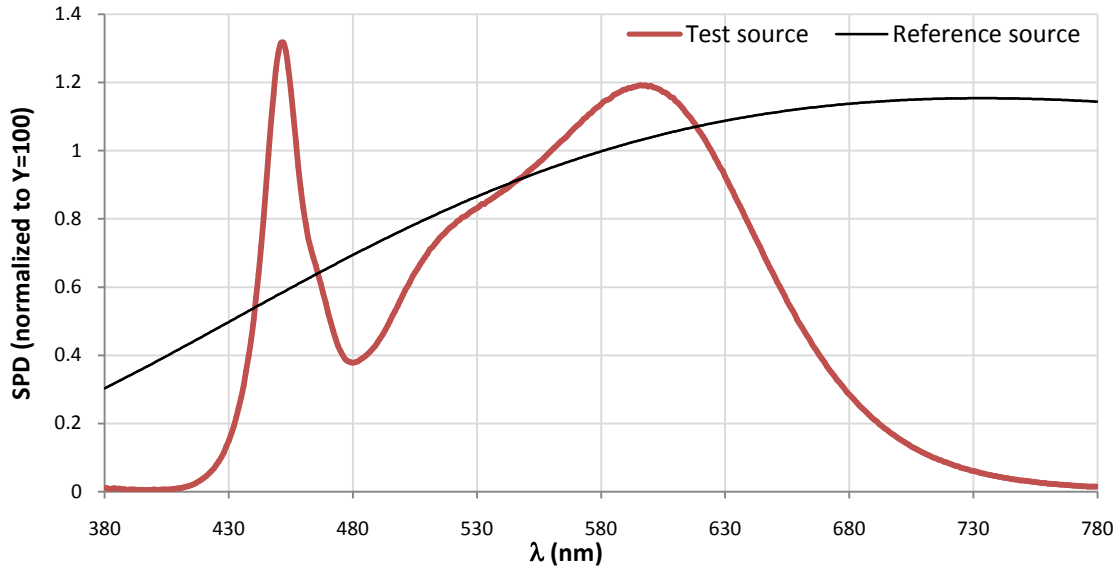
Ra			
<b>84.5</b>			
R1	R2	R3	R4
83	91	96	83
R5	R6	R7	R8
83	87	86	66
R9	R10	R11	R12
15	78	82	65
R13	R14	R15	
85	98	77	



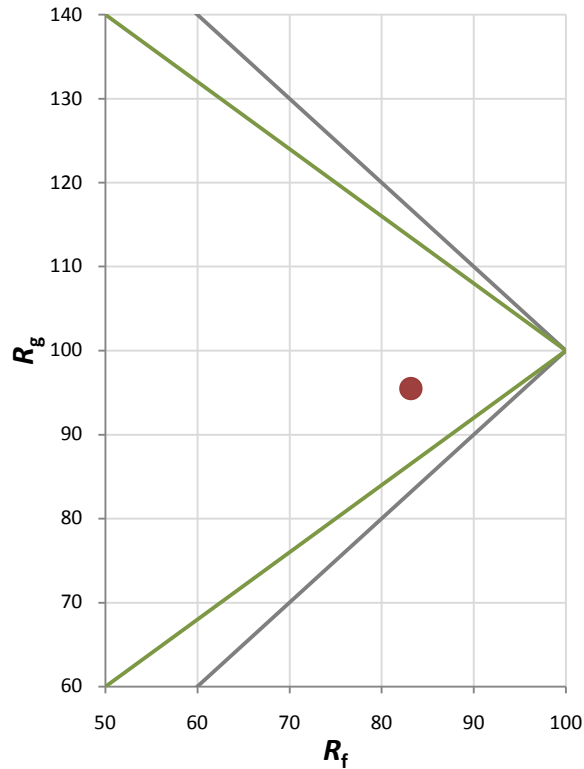
Fidelity Index and Gamut Index

Fidelity Index $R_f$	83
Gamut Index $R_g$	95

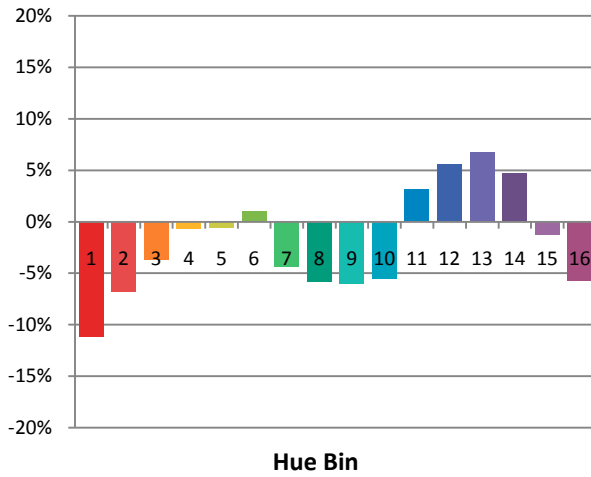
Spectral Power Distribution Comparison



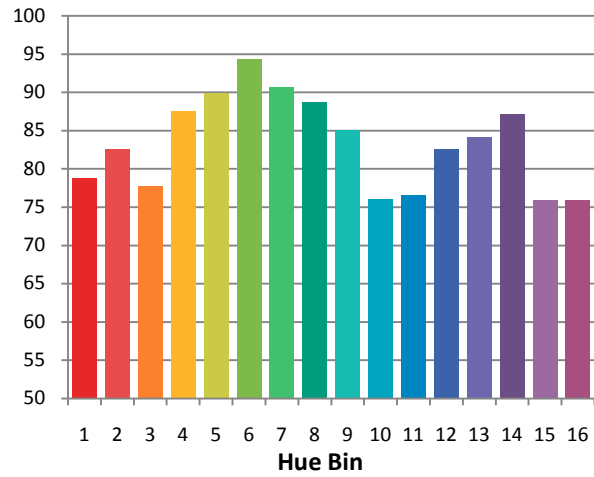
Plot of  $R_g$  versus  $R_f$



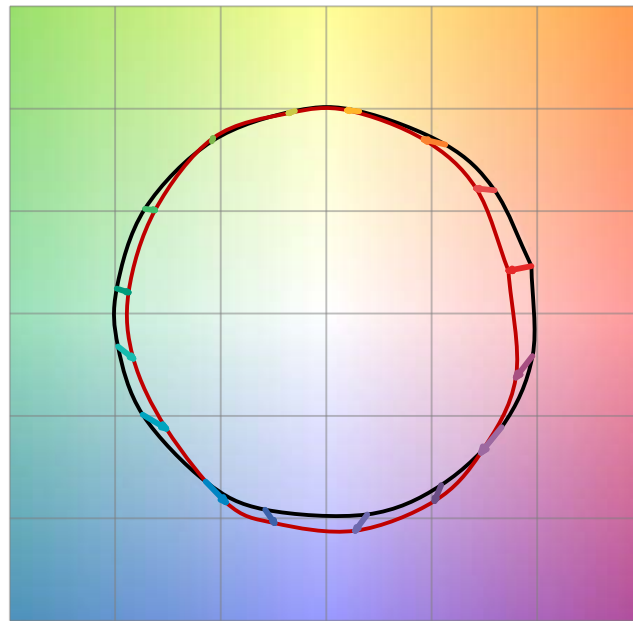
Chroma Shift by Hue



$R_f$  by Hue

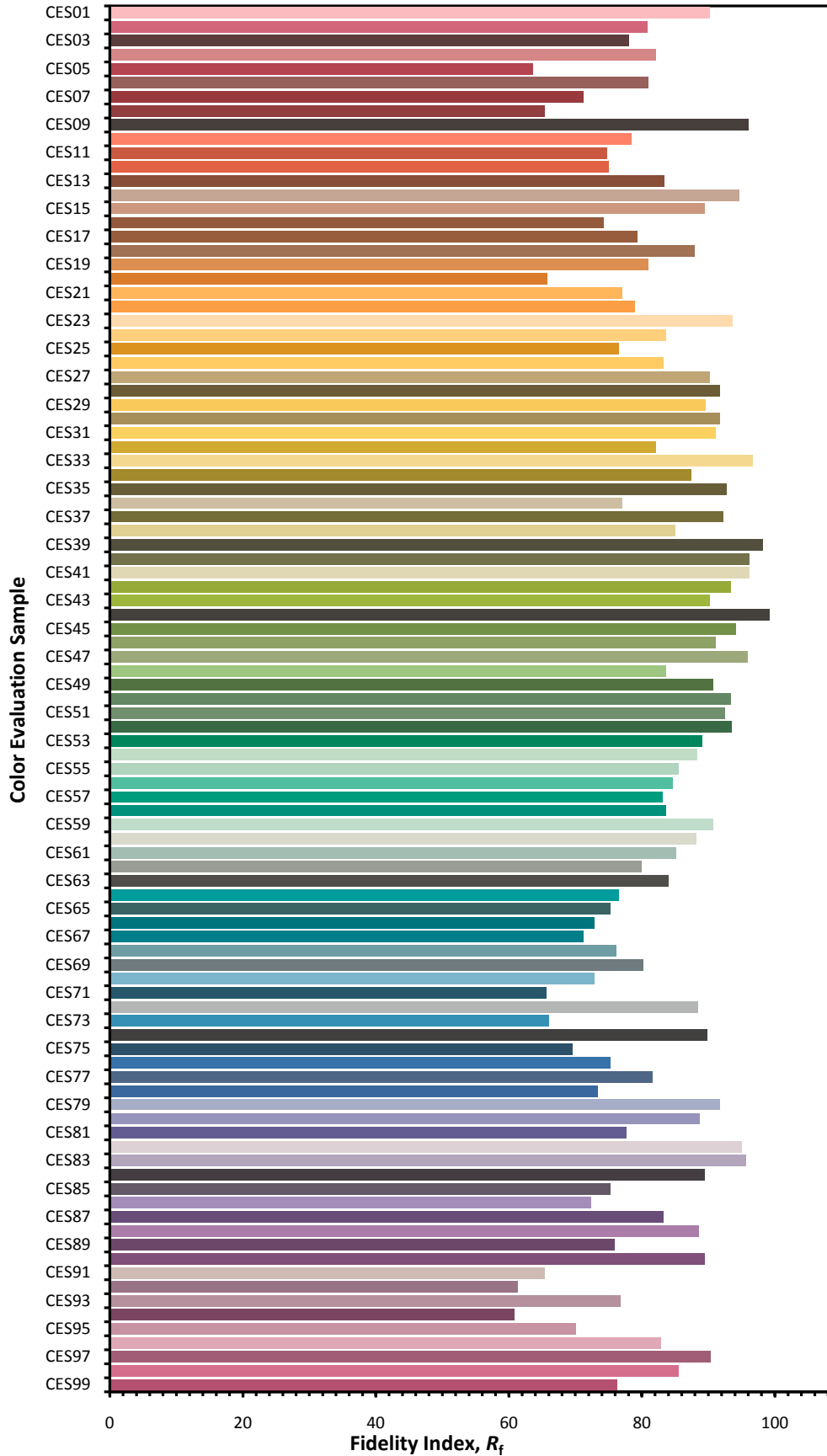


Color Vector Graphic

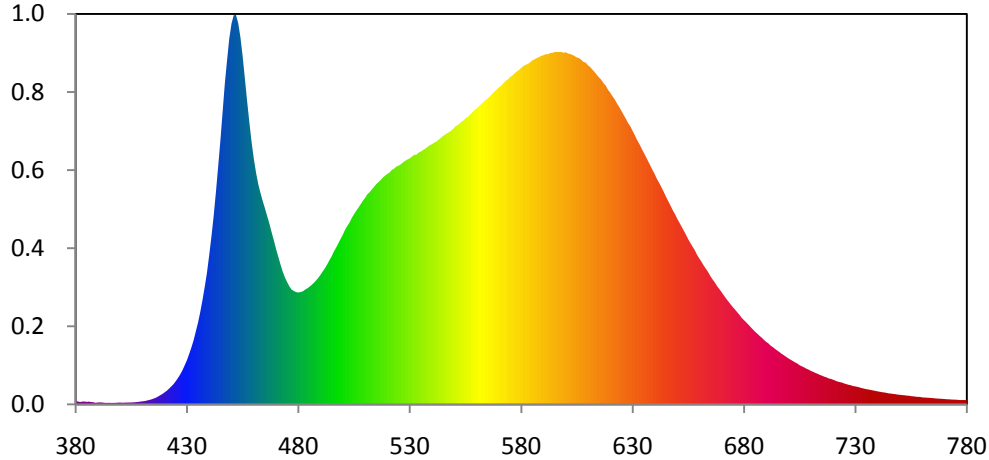


— Reference Illuminat    — Test Source

**Color Fidelity by CES Sample**



**Relative Spectral Power Distribution**

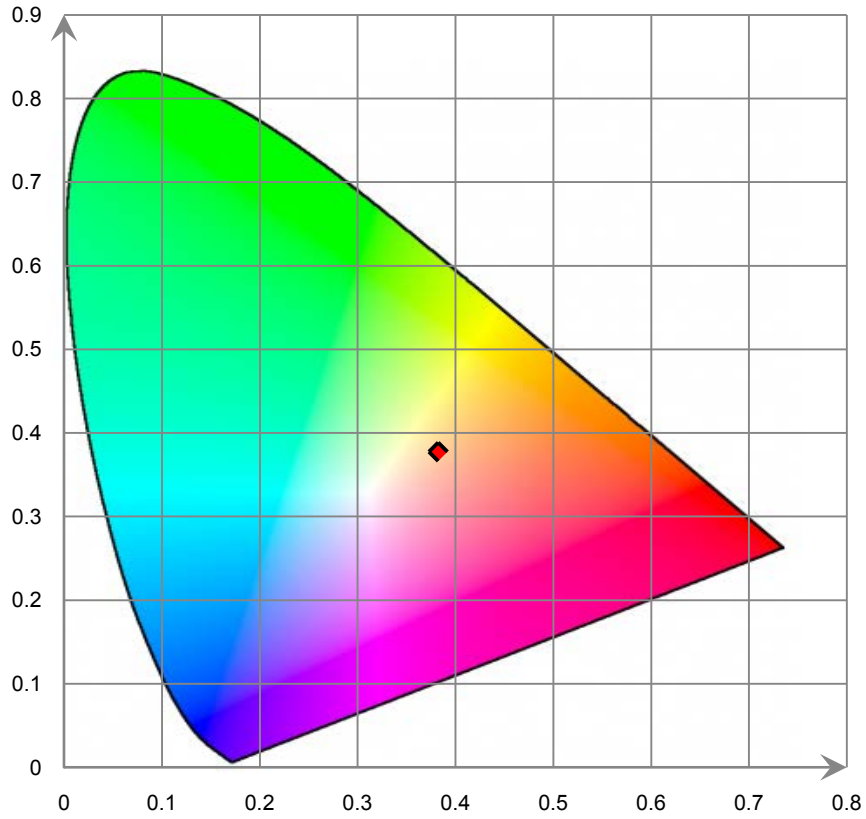


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	6.792E-01	421	2.723E+00	462	4.375E+01	503	3.610E+01	544	5.290E+01
381	5.778E-01	422	3.143E+00	463	4.200E+01	504	3.703E+01	545	5.328E+01
382	4.665E-01	423	3.571E+00	464	4.039E+01	505	3.774E+01	546	5.359E+01
383	5.486E-01	424	4.033E+00	465	3.896E+01	506	3.844E+01	547	5.389E+01
384	5.756E-01	425	4.610E+00	466	3.741E+01	507	3.908E+01	548	5.415E+01
385	4.993E-01	426	5.256E+00	467	3.591E+01	508	3.974E+01	549	5.448E+01
386	5.530E-01	427	5.960E+00	468	3.419E+01	509	4.042E+01	550	5.497E+01
387	4.602E-01	428	6.779E+00	469	3.259E+01	510	4.101E+01	551	5.533E+01
388	4.321E-01	429	7.763E+00	470	3.087E+01	511	4.172E+01	552	5.559E+01
389	3.077E-01	430	8.765E+00	471	2.931E+01	512	4.213E+01	553	5.602E+01
390	3.830E-01	431	9.995E+00	472	2.778E+01	513	4.267E+01	554	5.631E+01
391	3.956E-01	432	1.129E+01	473	2.635E+01	514	4.320E+01	555	5.678E+01
392	3.744E-01	433	1.273E+01	474	2.519E+01	515	4.373E+01	556	5.704E+01
393	3.066E-01	434	1.449E+01	475	2.426E+01	516	4.413E+01	557	5.746E+01
394	3.030E-01	435	1.627E+01	476	2.341E+01	517	4.456E+01	558	5.795E+01
395	3.083E-01	436	1.838E+01	477	2.278E+01	518	4.505E+01	559	5.838E+01
396	2.847E-01	437	2.077E+01	478	2.250E+01	519	4.542E+01	560	5.873E+01
397	2.992E-01	438	2.336E+01	479	2.230E+01	520	4.577E+01	561	5.917E+01
398	2.986E-01	439	2.617E+01	480	2.221E+01	521	4.607E+01	562	5.958E+01
399	3.454E-01	440	2.964E+01	481	2.230E+01	522	4.655E+01	563	6.001E+01
400	3.633E-01	441	3.332E+01	482	2.243E+01	523	4.680E+01	564	6.040E+01
401	3.255E-01	442	3.741E+01	483	2.276E+01	524	4.722E+01	565	6.072E+01
402	3.497E-01	443	4.208E+01	484	2.303E+01	525	4.738E+01	566	6.114E+01
403	3.641E-01	444	4.714E+01	485	2.335E+01	526	4.767E+01	567	6.163E+01
404	3.691E-01	445	5.226E+01	486	2.372E+01	527	4.804E+01	568	6.208E+01
405	3.816E-01	446	5.797E+01	487	2.413E+01	528	4.836E+01	569	6.252E+01
406	3.998E-01	447	6.363E+01	488	2.462E+01	529	4.862E+01	570	6.292E+01
407	4.436E-01	448	6.827E+01	489	2.515E+01	530	4.883E+01	571	6.325E+01
408	4.793E-01	449	7.261E+01	490	2.576E+01	531	4.919E+01	572	6.371E+01
409	5.540E-01	450	7.557E+01	491	2.642E+01	532	4.954E+01	573	6.419E+01
410	6.025E-01	451	7.726E+01	492	2.707E+01	533	4.956E+01	574	6.448E+01
411	6.544E-01	452	7.732E+01	493	2.783E+01	534	4.999E+01	575	6.498E+01
412	7.631E-01	453	7.571E+01	494	2.864E+01	535	5.020E+01	576	6.524E+01
413	8.711E-01	454	7.291E+01	495	2.944E+01	536	5.048E+01	577	6.569E+01
414	9.860E-01	455	6.915E+01	496	3.037E+01	537	5.076E+01	578	6.606E+01
415	1.143E+00	456	6.475E+01	497	3.114E+01	538	5.110E+01	579	6.637E+01
416	1.310E+00	457	6.028E+01	498	3.202E+01	539	5.143E+01	580	6.676E+01
417	1.552E+00	458	5.607E+01	499	3.287E+01	540	5.166E+01	581	6.717E+01
418	1.817E+00	459	5.216E+01	500	3.371E+01	541	5.196E+01	582	6.740E+01
419	2.069E+00	460	4.882E+01	501	3.469E+01	542	5.217E+01	583	6.758E+01
420	2.396E+00	461	4.606E+01	502	3.541E+01	543	5.256E+01	584	6.787E+01

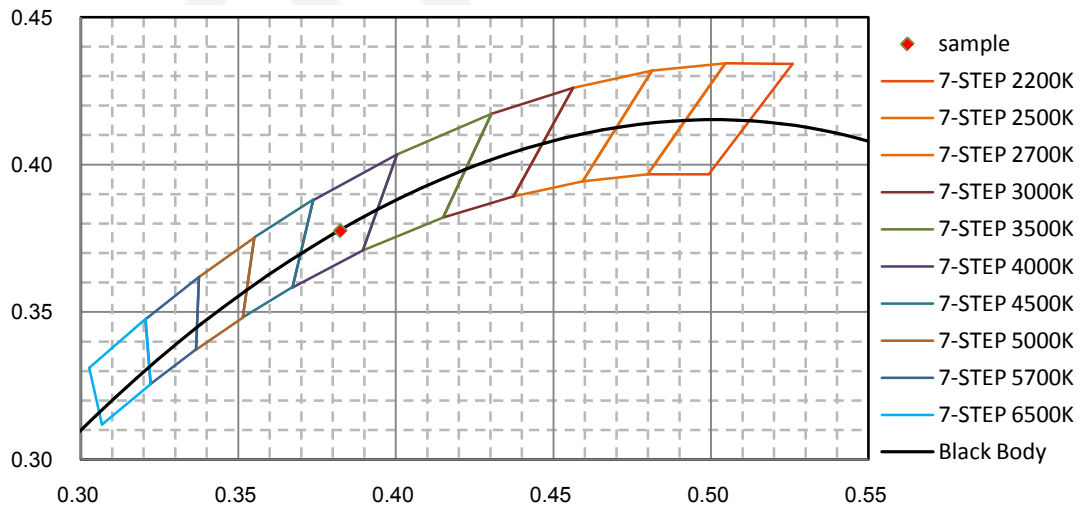


nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	6.828E+01	626	5.747E+01	667	2.417E+01	708	7.090E+00	749	1.949E+00
586	6.849E+01	627	5.671E+01	668	2.345E+01	709	6.908E+00	750	1.902E+00
587	6.875E+01	628	5.583E+01	669	2.288E+01	710	6.655E+00	751	1.847E+00
588	6.894E+01	629	5.522E+01	670	2.227E+01	711	6.471E+00	752	1.817E+00
589	6.920E+01	630	5.431E+01	671	2.163E+01	712	6.256E+00	753	1.747E+00
590	6.930E+01	631	5.345E+01	672	2.101E+01	713	6.084E+00	754	1.723E+00
591	6.952E+01	632	5.253E+01	673	2.044E+01	714	5.866E+00	755	1.639E+00
592	6.951E+01	633	5.174E+01	674	1.988E+01	715	5.708E+00	756	1.595E+00
593	6.973E+01	634	5.086E+01	675	1.931E+01	716	5.511E+00	757	1.531E+00
594	6.978E+01	635	4.999E+01	676	1.883E+01	717	5.375E+00	758	1.486E+00
595	6.994E+01	636	4.915E+01	677	1.829E+01	718	5.158E+00	759	1.481E+00
596	6.997E+01	637	4.828E+01	678	1.777E+01	719	5.060E+00	760	1.391E+00
597	6.995E+01	638	4.738E+01	679	1.717E+01	720	4.901E+00	761	1.363E+00
598	6.998E+01	639	4.651E+01	680	1.673E+01	721	4.711E+00	762	1.335E+00
599	6.979E+01	640	4.566E+01	681	1.630E+01	722	4.545E+00	763	1.301E+00
600	6.991E+01	641	4.471E+01	682	1.584E+01	723	4.424E+00	764	1.269E+00
601	6.966E+01	642	4.393E+01	683	1.535E+01	724	4.333E+00	765	1.234E+00
602	6.954E+01	643	4.307E+01	684	1.488E+01	725	4.151E+00	766	1.185E+00
603	6.939E+01	644	4.219E+01	685	1.443E+01	726	4.017E+00	767	1.147E+00
604	6.915E+01	645	4.125E+01	686	1.403E+01	727	3.892E+00	768	1.131E+00
605	6.886E+01	646	4.036E+01	687	1.362E+01	728	3.795E+00	769	1.090E+00
606	6.875E+01	647	3.950E+01	688	1.324E+01	729	3.632E+00	770	1.068E+00
607	6.839E+01	648	3.859E+01	689	1.280E+01	730	3.568E+00	771	1.017E+00
608	6.797E+01	649	3.781E+01	690	1.240E+01	731	3.470E+00	772	1.008E+00
609	6.784E+01	650	3.691E+01	691	1.210E+01	732	3.355E+00	773	9.713E-01
610	6.730E+01	651	3.611E+01	692	1.166E+01	733	3.219E+00	774	9.444E-01
611	6.696E+01	652	3.531E+01	693	1.135E+01	734	3.121E+00	775	9.353E-01
612	6.646E+01	653	3.449E+01	694	1.099E+01	735	3.025E+00	776	9.016E-01
613	6.595E+01	654	3.366E+01	695	1.068E+01	736	2.942E+00	777	8.587E-01
614	6.540E+01	655	3.278E+01	696	1.036E+01	737	2.859E+00	778	8.672E-01
615	6.488E+01	656	3.202E+01	697	1.001E+01	738	2.771E+00	779	8.592E-01
616	6.442E+01	657	3.128E+01	698	9.738E+00	739	2.680E+00	780	8.608E-01
617	6.375E+01	658	3.055E+01	699	9.422E+00	740	2.577E+00		
618	6.325E+01	659	2.965E+01	700	9.126E+00	741	2.505E+00		
619	6.245E+01	660	2.895E+01	701	8.863E+00	742	2.419E+00		
620	6.186E+01	661	2.827E+01	702	8.586E+00	743	2.362E+00		
621	6.116E+01	662	2.752E+01	703	8.326E+00	744	2.285E+00		
622	6.055E+01	663	2.688E+01	704	8.111E+00	745	2.188E+00		
623	5.975E+01	664	2.622E+01	705	7.762E+00	746	2.150E+00		
624	5.904E+01	665	2.543E+01	706	7.556E+00	747	2.079E+00		
625	5.828E+01	666	2.476E+01	707	7.345E+00	748	2.019E+00		

**CIE 1931 x y Chromaticity Diagram**



**7-Step Chromaticity Quadrangles**



**[Goniophotometer System]**

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

Test orientation: **Downward**

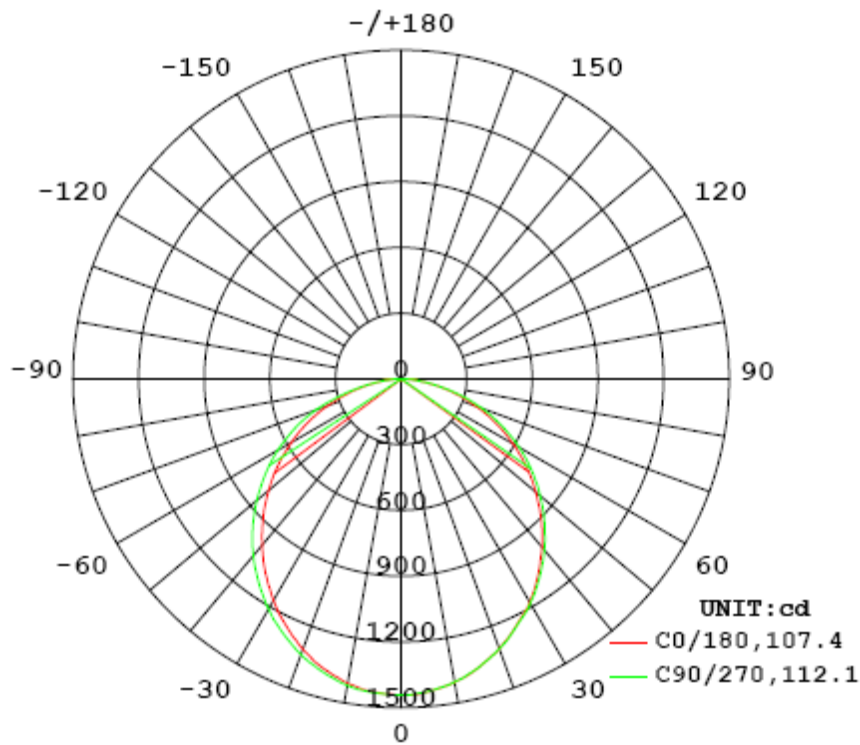
**Electrical Measurement**

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.3448	41.07	0.9925

**Photometric Measurement**

Luminous Flux (lm)	Efficacy (lm/W)	I <sub>max</sub> (cd)	S/MH (C0/180)	S/MH (C90/270)
4047.49	98.55	1443.0	1.22	1.23

**Luminous Intensity Distribution**



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I <sub>max</sub> ):	107.4	112.1	112.1	112.6	111.1
Field Angle (10% I <sub>max</sub> ):	160.3	162.4	161.1	162.5	161.6

Luminous Intensity (cd) Distribution Data

C y	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	1442	1442	1442	1442	1442	1442	1442	1442
5.0°	1434	1435	1438	1438	1437	1439	1435	1432
10.0°	1410	1414	1416	1419	1419	1417	1414	1409
15.0°	1368	1374	1381	1385	1384	1384	1378	1368
20.0°	1313	1321	1330	1336	1338	1336	1328	1317
25.0°	1244	1256	1269	1277	1280	1280	1268	1252
30.0°	1167	1180	1197	1208	1212	1211	1200	1179
35.0°	1082	1096	1120	1132	1136	1138	1124	1098
40.0°	989	1007	1034	1048	1052	1054	1041	1009
45.0°	893	913	946	958	960	965	950	915
50.0°	792	814	850	861	862	867	855	816
55.0°	688	711	751	761	759	766	753	713
60.0°	580	604	642	654	653	659	647	606
65.0°	472	494	532	545	540	547	536	497
70.0°	359	380	412	425	416	427	417	381
75.0°	249	265	293	294	276	291	296	265
80.0°	145	157	175	165	158	162	173	155
85.0°	58	66	68	65	65	65	63	63
90.0°	6	8	7	9	9	9	7	6
95.0°	0	1	0	0	0	0	1	1
100.0°	1	1	1	1	1	1	1	1
105.0°	1	1	1	1	1	1	1	1
110.0°	1	1	1	1	1	1	1	1
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	1	1	1	1	1	1
125.0°	1	1	1	1	1	1	1	1
130.0°	1	1	1	1	1	1	1	1
135.0°	1	1	1	1	1	1	1	1
140.0°	1	1	1	1	1	1	1	1
145.0°	1	1	1	1	1	1	1	1
150.0°	1	1	1	1	1	1	1	1
155.0°	1	1	1	1	2	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	1	1	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	1	1	1	1	1	1	1	1

Luminous Intensity (cd) Distribution Data (cont.)

C y	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	1442	1442	1442	1442	1442	1442	1442	1442
5.0°	1432	1430	1431	1430	1431	1434	1433	1434
10.0°	1405	1404	1403	1402	1404	1406	1408	1410
15.0°	1364	1361	1362	1361	1363	1366	1368	1369
20.0°	1311	1307	1307	1309	1310	1311	1313	1315
25.0°	1244	1241	1244	1247	1247	1250	1249	1247
30.0°	1176	1174	1179	1182	1181	1181	1183	1179
35.0°	1092	1090	1099	1105	1104	1106	1102	1093
40.0°	1002	1002	1017	1023	1019	1018	1018	1005
45.0°	906	908	929	935	927	932	931	911
50.0°	804	810	837	839	830	834	839	815
55.0°	699	708	737	739	729	737	741	714
60.0°	591	602	632	633	622	629	635	608
65.0°	479	491	518	521	509	519	522	497
70.0°	365	376	404	403	393	403	403	382
75.0°	253	262	282	284	275	286	285	268
80.0°	149	159	167	161	156	165	173	160
85.0°	60	63	62	61	62	63	70	69
90.0°	2	2	3	6	10	10	6	9
95.0°	0	1	0	0	0	0	0	0
100.0°	1	1	1	1	1	1	1	1
105.0°	1	1	1	1	1	1	1	1
110.0°	1	1	1	1	1	1	1	1
115.0°	1	1	1	1	1	1	1	1
120.0°	1	1	1	1	1	1	1	1
125.0°	1	1	1	1	1	1	1	1
130.0°	1	1	1	1	1	1	1	1
135.0°	1	1	1	1	1	1	1	1
140.0°	1	1	1	1	1	1	1	1
145.0°	1	1	1	1	1	1	1	1
150.0°	1	1	1	1	1	1	1	1
155.0°	1	1	1	1	1	1	1	1
160.0°	1	1	1	1	1	1	1	1
165.0°	1	1	1	1	1	1	1	1
170.0°	1	1	1	1	1	1	1	1
175.0°	1	1	1	1	1	1	1	1
180.0°	1	1	1	1	1	1	1	1

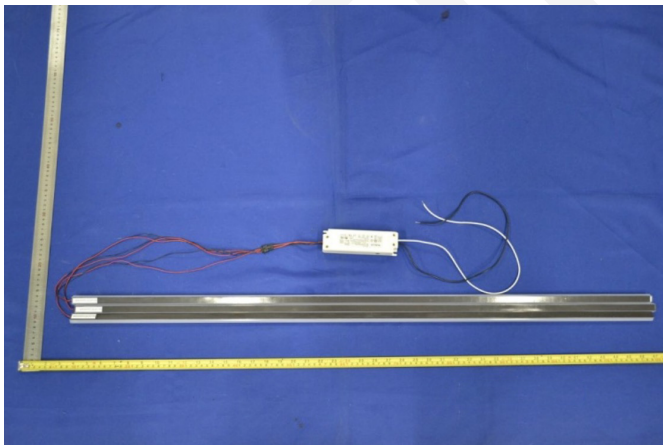
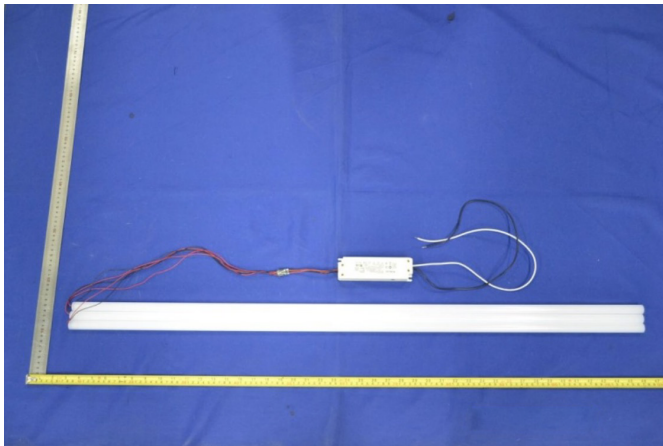
Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	34.4	0.85	0-5	34.4	0.85
5-10	101.7	2.51	0-10	136.1	3.36
10-15	165.0	4.08	0-15	301.1	7.44
15-20	221.6	5.47	0-20	522.7	12.91
20-25	270.0	6.67	0-25	792.7	19.58
25-30	309.1	7.64	0-30	1101.8	27.22
30-35	337.7	8.35	0-35	1439.5	35.57
35-40	355.0	8.77	0-40	1794.5	44.34
40-45	361.2	8.92	0-45	2155.7	53.26
45-50	356.1	8.80	0-50	2511.8	62.06
50-55	340.1	8.40	0-55	2851.9	70.46
55-60	313.5	7.75	0-60	3165.4	78.21
60-65	276.8	6.84	0-65	3442.2	85.05
65-70	230.5	5.69	0-70	3672.8	90.74
70-75	175.9	4.35	0-75	3848.7	95.09
75-80	116.5	2.88	0-80	3965.2	97.97
80-85	59.9	1.48	0-85	4025.1	99.45
85-90	17.1	0.42	0-90	4042.1	99.87
90-95	0.8	0.02	0-95	4043.0	99.89
95-100	0.3	0.01	0-100	4043.2	99.90
100-105	0.3	0.00	0-105	4043.6	99.90
105-110	0.3	0.01	0-110	4043.9	99.91
110-115	0.3	0.01	0-115	4044.3	99.92
115-120	0.3	0.01	0-120	4044.6	99.93
120-125	0.3	0.01	0-125	4044.9	99.94
125-130	0.3	0.00	0-130	4045.2	99.94
130-135	0.3	0.01	0-135	4045.6	99.95
135-140	0.3	0.01	0-140	4045.9	99.96
140-145	0.3	0.01	0-145	4046.2	99.97
145-150	0.3	0.01	0-150	4046.5	99.98
150-155	0.3	0.00	0-155	4046.8	99.98
155-160	0.2	0.01	0-160	4047.1	99.99
160-165	0.2	0.00	0-165	4047.2	99.99
165-170	0.1	0.01	0-170	4047.4	100.00
170-175	0.1	0.00	0-175	4047.5	100.00
175-180	0.0	0.00	0-180	4047.5	100.00

**[Additional Test]**

Test Item	Test Voltage (V)	Frequency (Hz)	Test Result
Power Factor:	277.0	60	0.9524
Total Harmonic Distortion:	277.0	60	9.31%
Total Harmonic Distortion:	120.0	60	8.85%
Total Harmonic Distortion:	100.0	60	8.08%
Power Factor:	100.0	60	0.9987

**6. Product Photo**



## 7. Product Test orientation in the Goniophotometer



Auxiliary Equipment (Recessed Troffer)



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