



IES LM-79-08

MEASUREMENT AND TEST REPORT

For

ATG Electronics Corp

10700 7th Street
Rancho Cucamonga, CA 91730, USA

Test Model: SCP-40-40-D

Report Type:	Electrical and Photometric tests including: Luminous Flux, Chromaticity, Luminous Intensity Distribution
Test Engineer:	George Yang <i>George Yang</i>
Report Number:	RKSB181017001-10
Test Date:	2018-04-16
Report Date:	2018-10-17
Reviewed By:	Ray Gao/EE Engineer <i>Ray Gao</i>
Prepared By:	Bay Area Compliance Laboratories Corp. (Kunshan). No.248 Chenghu Road, Kunshan, Jiangsu province, China. Tel: +86-0512-86175000 Fax: +86-0512-88934268
Test Facility:	Test facility was located at No.248 Chenghu Road, Kunshan, Jiangsu province, China.
Accreditation:	The IAS Accreditation Number TL-749.

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. (Kunshan). 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 2018-04-13 and used for testing.

Model Tested: SCP-40-40-D
 Manufacturer: ATG Electronics Corp
 Brand Name: ATG
 Product Designation: Fuel Pump Canopy Luminaires
 Aging Time Before Test: 0hour(For New Products)

Rated Values:

Rated Voltage/Frequency: 120-277 VAC 50/60Hz
 Rated Power: 40 W
 Nominal CCT: 4000K
 Nominal Lumen Output: 4600 lm

Note:

1. The applicant *ATG Electronics Corp* declare that their product with model SCP-40-40-D is the same to the product in report# RKSB180413002-10 and is authorized by original applicant to use their test data.
2. All the data in previous report (RKSB180413002-10) is shared in report.

2. Standards Used

- IES LM-79-08: Approved Method: Electrical & Photometric Measurement of Solid-state Lighting Products
- ANSI C82.77-10-2014: Harmonic Emission Limits – Related Power Quality Requirements for Lighting Equipment
- IES TM-30-15: IES Method for Evaluating Light Source Color Rendition

3. Description of Test Equipment

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Integrating Sphere	INVENTFINE	Dia 1.5m	JWWCV090112	2018-01-24	2019-01-24
Power Meter	INVENTFINE	WT500	GSJWQ20009	2018-03-23	2019-03-22
Spectral photometer	INVENTFINE	CMS-3S	GSGSE100017	2018-01-24	2019-01-24
AC Power Supply	INVENTFINE	CHP500	JWJSD010071	2018-03-23	2019-03-22
Standard Light Source	INVENTFINE	N/A	JWWCR020106	2018-01-24	2019-01-24
Thermal Meter	KEJIAN	TA298	N/A	2017-11-14	2018-11-14
DC Power Supply	INVENTFINE	WL3005	JWWCP020069	2018-03-23	2019-03-22
AC Power Supply	INVENTFINE	CHP-5KVA	900511765	2018-03-23	2019-03-22
DC Power Supply	INVENTFINE	WL3010	JWDMP030001	2018-03-23	2019-03-22
Power Meter	INVENTFINE	WT500	GSDSQ200007	2018-03-23	2019-03-22

Device	Manufacture	Model No	Serial No	Calibration date	Calibration due date
Goniophotometer	INVENTFINE	GPM-1900	YWGCF120001	2018-01-24	2019-01-24
Wireless Weather Station	ZHONGXING	KG218	N/A	2017-11-14	2018-11-14
Standard Light Source	INVENTFINE	N/A	JWBYR040007	2018-01-24	2019-01-24

Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) 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 π 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 $U=2.6\%$ ($K=2$), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is $U=24\text{K}$ ($K=2$), at the 95% confidence level. The uncertainty of the CRI is $U=2.5(K=2)$, at the 95% confidence level.

The uncertainty of power meter AC current $U=0.16\%$ of rdg, AC Voltage $U=0.18\%$ of rdg, Power $U=0.14\%$ ($K=2$), 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 flux is $U=2.6\%$ ($K=2$), 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**

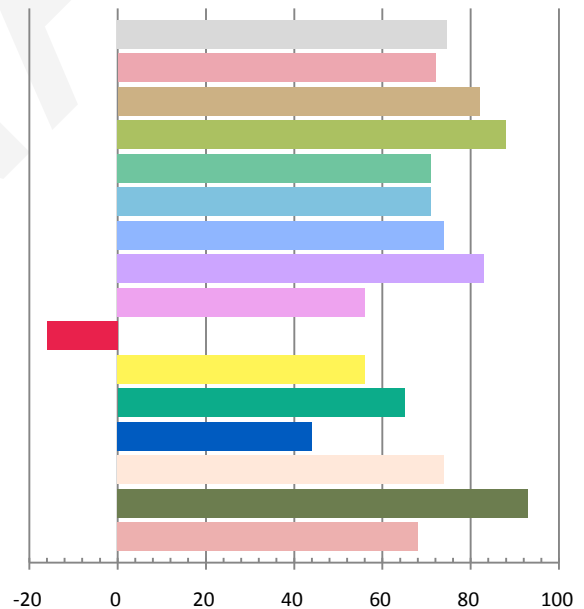
Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.3242	38.64	0.9930	4710.1	121.9

Radiant Flux (W)	CCT (K)	Duv	x	y	u'	v'
13.900	4023	-0.00126	0.3786	0.3729	0.2254	0.4996

Color Rendering Index

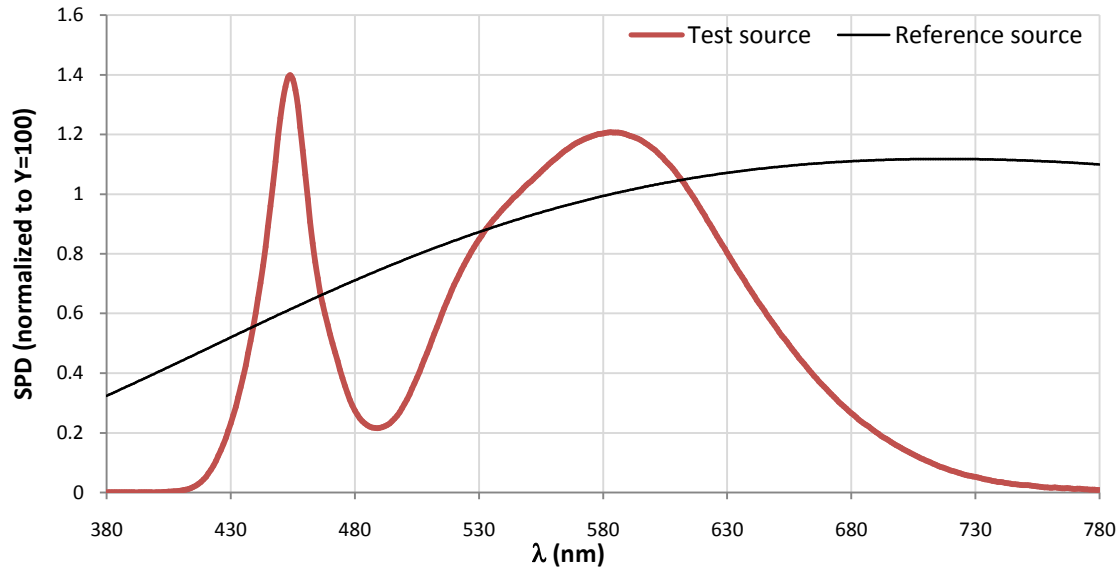
Ra 74.7			
R1 72	R2 82	R3 88	R4 71
R5 71	R6 74	R7 83	R8 56
R9 -16	R10 56	R11 65	R12 44
R13 74	R14 93	R15 68	



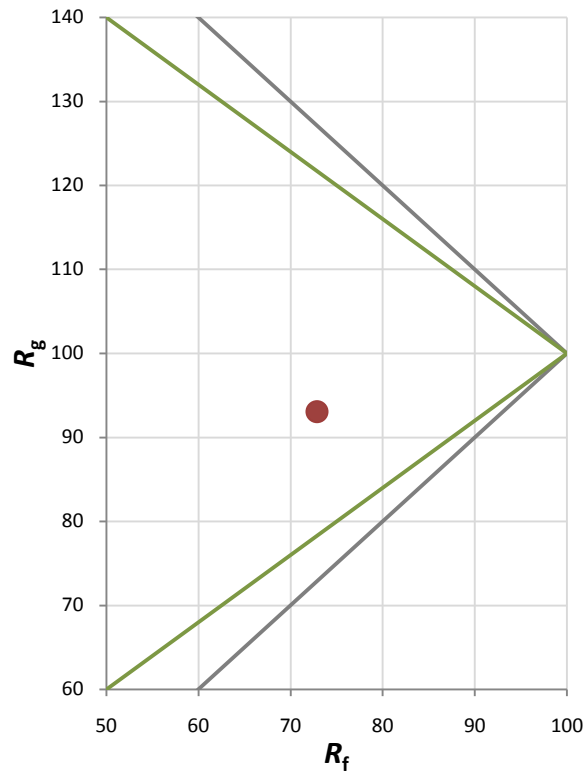
Fidelity Index and Gamut Index

Fidelity Index R_f	73
Gamut Index R_g	93

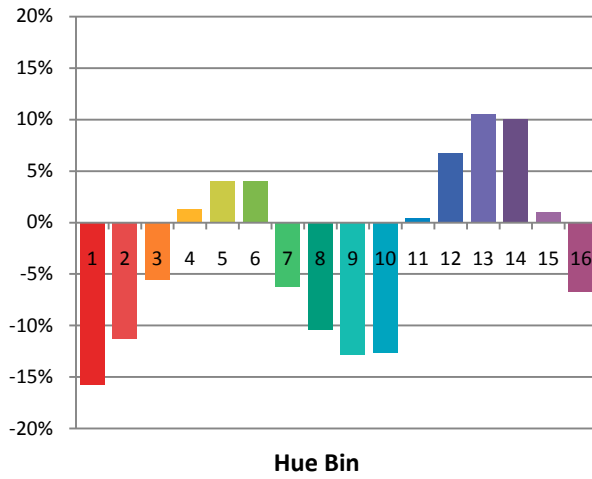
Spectral Power Distribution Comparison



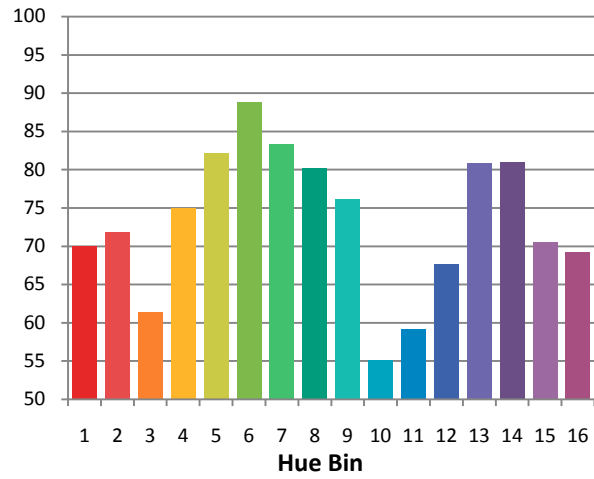
Plot of R_g versus R_f



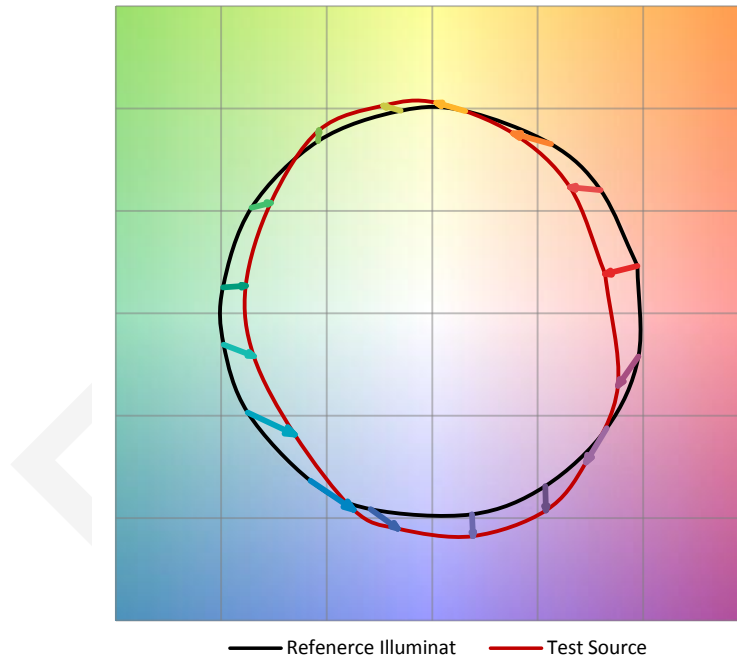
Chroma Shift by Hue



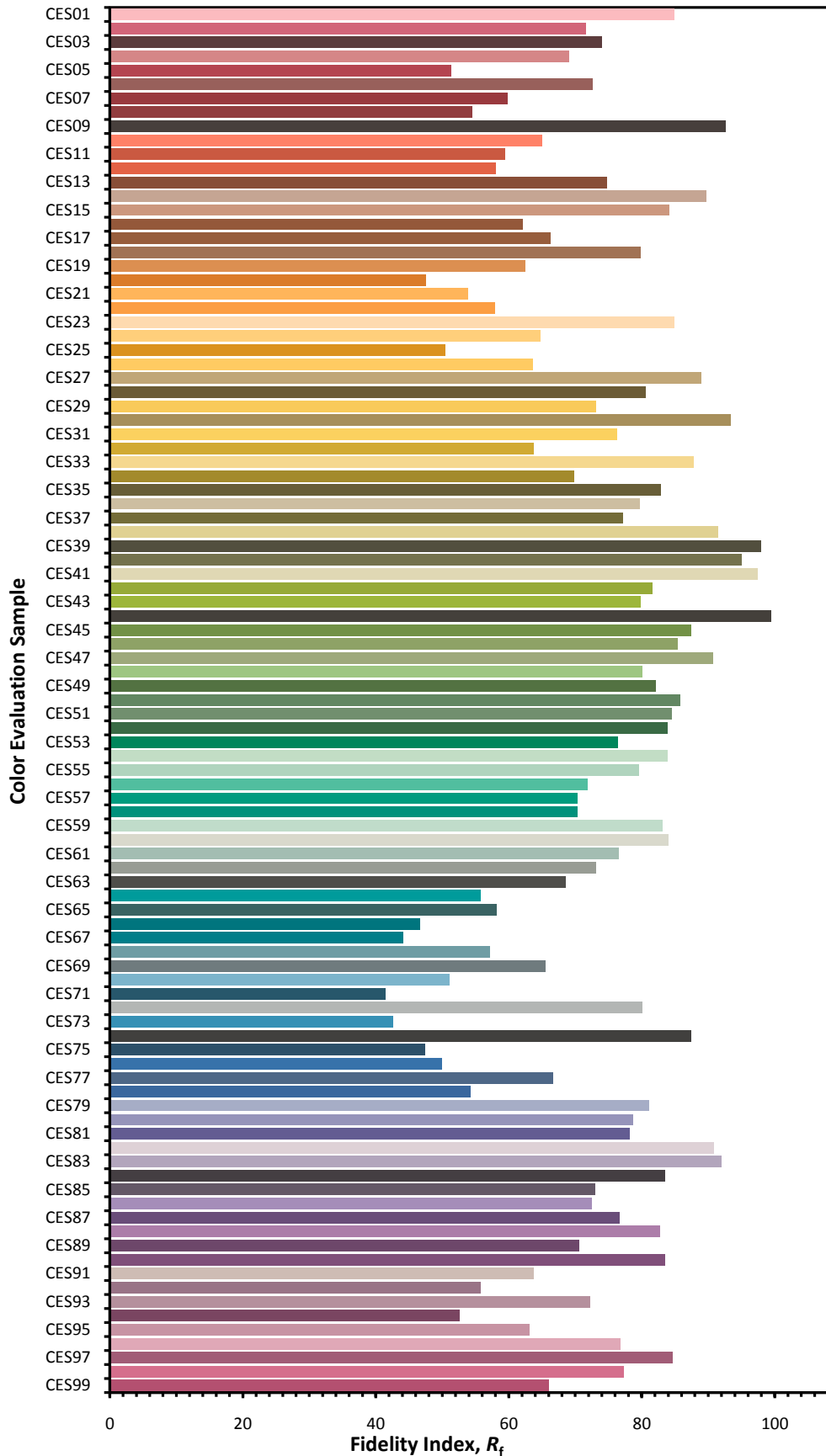
R_f by Hue



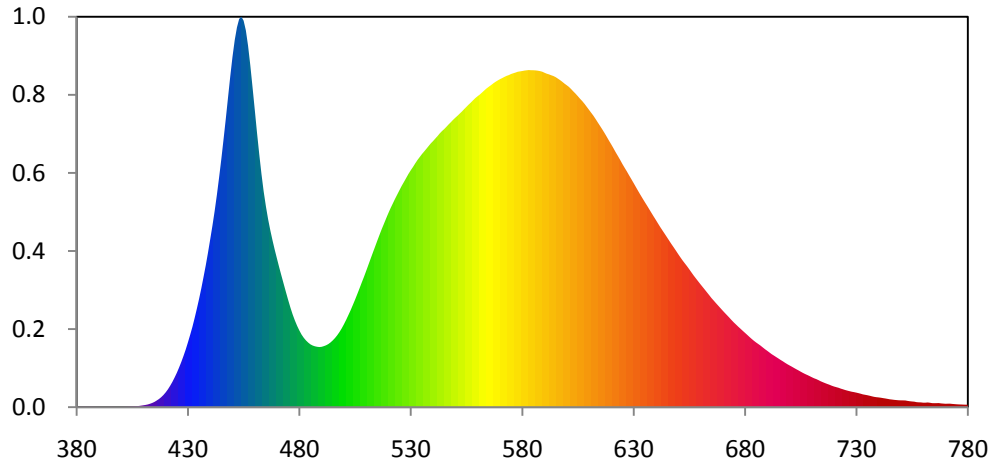
Color Vector Graphic



Color Fidelity by CES Sample



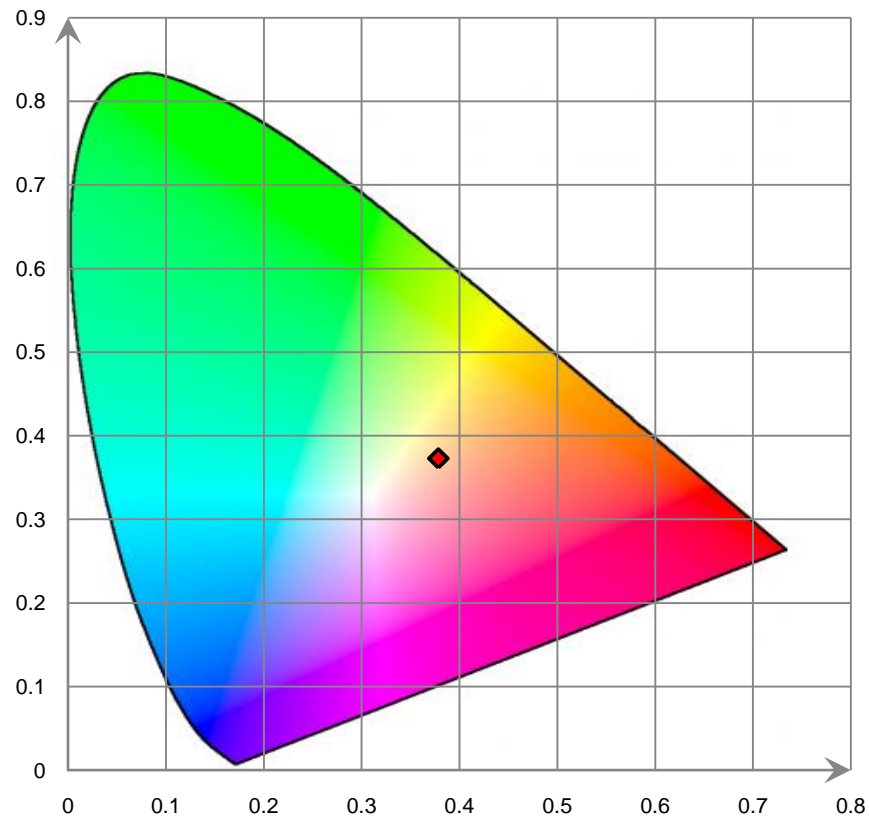
Relative Spectral Power Distribution



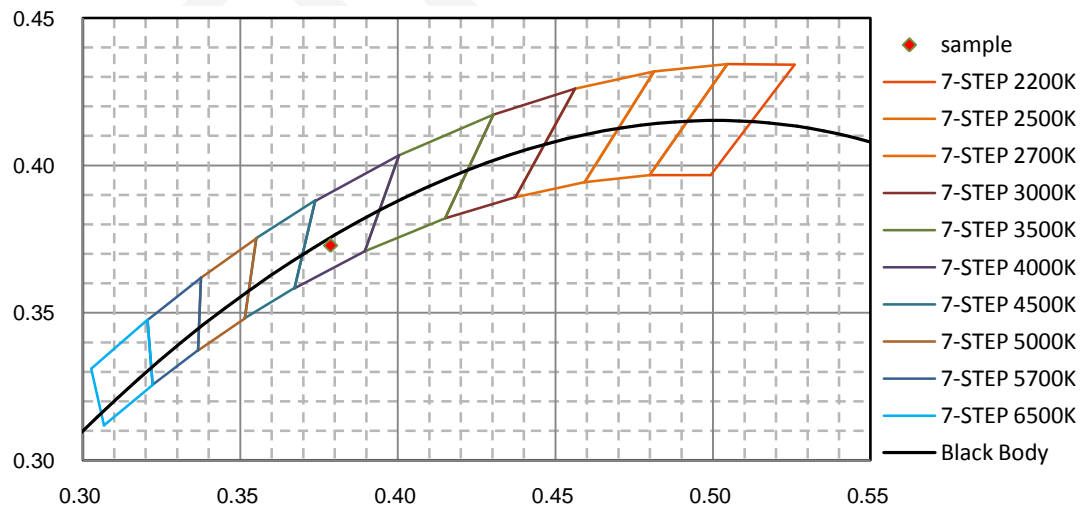
nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	9.730E-02	421	4.396E+00	462	6.251E+01	503	2.392E+01	544	6.815E+01
381	7.300E-02	422	5.265E+00	463	5.758E+01	504	2.520E+01	545	6.864E+01
382	6.370E-02	423	6.226E+00	464	5.326E+01	505	2.653E+01	546	6.922E+01
383	8.650E-02	424	7.302E+00	465	4.957E+01	506	2.790E+01	547	6.981E+01
384	9.080E-02	425	8.467E+00	466	4.638E+01	507	2.931E+01	548	7.036E+01
385	9.360E-02	426	9.743E+00	467	4.360E+01	508	3.076E+01	549	7.095E+01
386	9.320E-02	427	1.113E+01	468	4.111E+01	509	3.216E+01	550	7.147E+01
387	9.550E-02	428	1.263E+01	469	3.877E+01	510	3.363E+01	551	7.195E+01
388	6.980E-02	429	1.423E+01	470	3.662E+01	511	3.515E+01	552	7.248E+01
389	6.870E-02	430	1.599E+01	471	3.445E+01	512	3.665E+01	553	7.302E+01
390	6.150E-02	431	1.786E+01	472	3.240E+01	513	3.815E+01	554	7.359E+01
391	4.020E-02	432	1.981E+01	473	3.040E+01	514	3.963E+01	555	7.415E+01
392	3.130E-02	433	2.198E+01	474	2.839E+01	515	4.111E+01	556	7.471E+01
393	4.730E-02	434	2.431E+01	475	2.645E+01	516	4.258E+01	557	7.522E+01
394	6.800E-02	435	2.674E+01	476	2.460E+01	517	4.397E+01	558	7.578E+01
395	7.750E-02	436	2.933E+01	477	2.291E+01	518	4.532E+01	559	7.632E+01
396	7.070E-02	437	3.212E+01	478	2.141E+01	519	4.665E+01	560	7.676E+01
397	5.310E-02	438	3.502E+01	479	2.010E+01	520	4.796E+01	561	7.719E+01
398	3.650E-02	439	3.812E+01	480	1.894E+01	521	4.918E+01	562	7.768E+01
399	2.390E-02	440	4.144E+01	481	1.793E+01	522	5.033E+01	563	7.820E+01
400	4.030E-02	441	4.480E+01	482	1.712E+01	523	5.147E+01	564	7.868E+01
401	5.650E-02	442	4.845E+01	483	1.646E+01	524	5.256E+01	565	7.910E+01
402	7.590E-02	443	5.245E+01	484	1.593E+01	525	5.364E+01	566	7.950E+01
403	1.136E-01	444	5.675E+01	485	1.550E+01	526	5.469E+01	567	7.993E+01
404	1.513E-01	445	6.134E+01	486	1.522E+01	527	5.565E+01	568	8.031E+01
405	1.870E-01	446	6.619E+01	487	1.503E+01	528	5.662E+01	569	8.065E+01
406	2.261E-01	447	7.122E+01	488	1.491E+01	529	5.761E+01	570	8.096E+01
407	2.681E-01	448	7.646E+01	489	1.485E+01	530	5.848E+01	571	8.124E+01
408	3.011E-01	449	8.169E+01	490	1.491E+01	531	5.930E+01	572	8.153E+01
409	3.869E-01	450	8.647E+01	491	1.507E+01	532	6.017E+01	573	8.180E+01
410	4.736E-01	451	9.062E+01	492	1.528E+01	533	6.100E+01	574	8.198E+01
411	5.593E-01	452	9.378E+01	493	1.558E+01	534	6.174E+01	575	8.225E+01
412	6.707E-01	453	9.587E+01	494	1.598E+01	535	6.245E+01	576	8.244E+01
413	8.437E-01	454	9.640E+01	495	1.649E+01	536	6.311E+01	577	8.261E+01
414	1.052E+00	455	9.543E+01	496	1.707E+01	537	6.377E+01	578	8.281E+01
415	1.312E+00	456	9.301E+01	497	1.775E+01	538	6.446E+01	579	8.291E+01
416	1.645E+00	457	8.921E+01	498	1.853E+01	539	6.512E+01	580	8.299E+01
417	2.019E+00	458	8.439E+01	499	1.944E+01	540	6.569E+01	581	8.309E+01
418	2.472E+00	459	7.902E+01	500	2.045E+01	541	6.629E+01	582	8.318E+01
419	3.002E+00	460	7.344E+01	501	2.154E+01	542	6.691E+01	583	8.324E+01
420	3.641E+00	461	6.783E+01	502	2.272E+01	543	6.758E+01	584	8.320E+01

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
585	8.318E+01	626	5.912E+01	667	2.568E+01	708	7.942E+00	749	1.708E+00
586	8.315E+01	627	5.821E+01	668	2.507E+01	709	7.679E+00	750	1.682E+00
587	8.308E+01	628	5.725E+01	669	2.446E+01	710	7.402E+00	751	1.673E+00
588	8.298E+01	629	5.632E+01	670	2.386E+01	711	7.143E+00	752	1.656E+00
589	8.283E+01	630	5.538E+01	671	2.326E+01	712	6.939E+00	753	1.554E+00
590	8.258E+01	631	5.441E+01	672	2.270E+01	713	6.677E+00	754	1.470E+00
591	8.235E+01	632	5.346E+01	673	2.210E+01	714	6.401E+00	755	1.412E+00
592	8.218E+01	633	5.251E+01	674	2.151E+01	715	6.161E+00	756	1.360E+00
593	8.196E+01	634	5.160E+01	675	2.093E+01	716	5.940E+00	757	1.246E+00
594	8.177E+01	635	5.070E+01	676	2.041E+01	717	5.730E+00	758	1.198E+00
595	8.150E+01	636	4.982E+01	677	1.988E+01	718	5.525E+00	759	1.171E+00
596	8.113E+01	637	4.892E+01	678	1.938E+01	719	5.297E+00	760	1.110E+00
597	8.077E+01	638	4.801E+01	679	1.887E+01	720	5.104E+00	761	1.106E+00
598	8.036E+01	639	4.712E+01	680	1.837E+01	721	4.950E+00	762	1.166E+00
599	7.989E+01	640	4.623E+01	681	1.787E+01	722	4.790E+00	763	1.100E+00
600	7.949E+01	641	4.535E+01	682	1.736E+01	723	4.588E+00	764	9.992E-01
601	7.908E+01	642	4.446E+01	683	1.687E+01	724	4.416E+00	765	9.865E-01
602	7.853E+01	643	4.363E+01	684	1.640E+01	725	4.244E+00	766	9.905E-01
603	7.795E+01	644	4.281E+01	685	1.598E+01	726	4.084E+00	767	1.015E+00
604	7.739E+01	645	4.197E+01	686	1.560E+01	727	3.945E+00	768	9.362E-01
605	7.678E+01	646	4.113E+01	687	1.521E+01	728	3.808E+00	769	8.824E-01
606	7.615E+01	647	4.028E+01	688	1.476E+01	729	3.712E+00	770	8.428E-01
607	7.556E+01	648	3.949E+01	689	1.432E+01	730	3.591E+00	771	8.623E-01
608	7.490E+01	649	3.867E+01	690	1.392E+01	731	3.465E+00	772	8.694E-01
609	7.416E+01	650	3.784E+01	691	1.350E+01	732	3.316E+00	773	8.067E-01
610	7.343E+01	651	3.703E+01	692	1.310E+01	733	3.153E+00	774	7.602E-01
611	7.268E+01	652	3.625E+01	693	1.274E+01	734	3.054E+00	775	7.112E-01
612	7.196E+01	653	3.553E+01	694	1.239E+01	735	2.948E+00	776	6.866E-01
613	7.112E+01	654	3.482E+01	695	1.203E+01	736	2.825E+00	777	6.669E-01
614	7.027E+01	655	3.406E+01	696	1.168E+01	737	2.681E+00	778	6.321E-01
615	6.942E+01	656	3.328E+01	697	1.134E+01	738	2.550E+00	779	6.169E-01
616	6.856E+01	657	3.251E+01	698	1.097E+01	739	2.465E+00	780	6.182E-01
617	6.768E+01	658	3.178E+01	699	1.062E+01	740	2.407E+00		
618	6.674E+01	659	3.108E+01	700	1.031E+01	741	2.330E+00		
619	6.580E+01	660	3.038E+01	701	1.001E+01	742	2.234E+00		
620	6.488E+01	661	2.970E+01	702	9.697E+00	743	2.154E+00		
621	6.393E+01	662	2.901E+01	703	9.387E+00	744	2.050E+00		
622	6.293E+01	663	2.833E+01	704	9.090E+00	745	1.944E+00		
623	6.200E+01	664	2.764E+01	705	8.775E+00	746	1.883E+00		
624	6.105E+01	665	2.694E+01	706	8.476E+00	747	1.814E+00		
625	6.005E+01	666	2.632E+01	707	8.193E+00	748	1.755E+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**

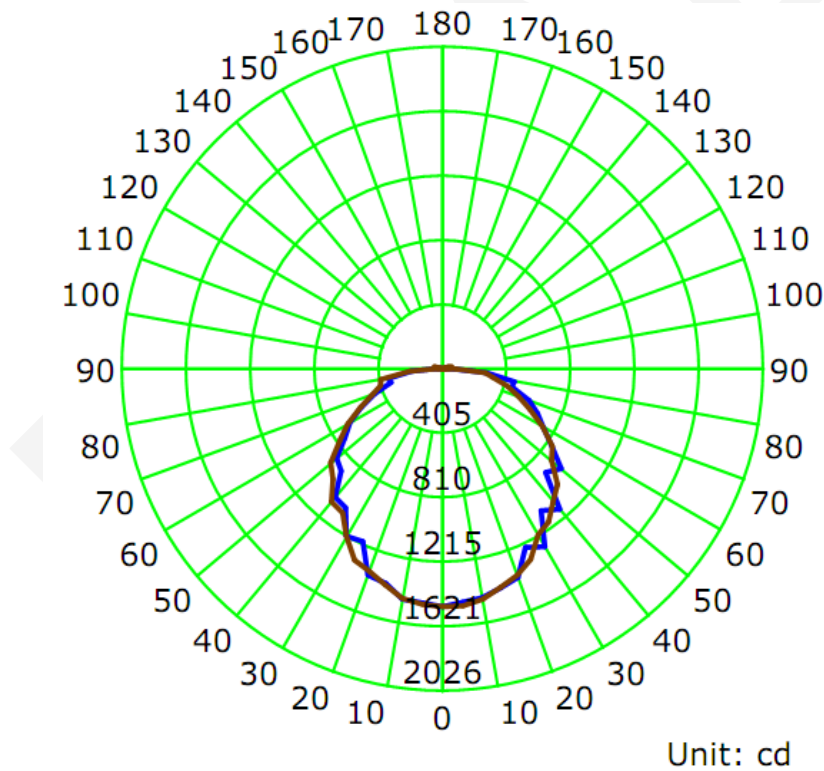
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current (A)	Power (W)	Power Factor
120.0	60	0.3270	38.71	0.9860

Photometric Measurement

Luminous Flux (lm)	Efficacy (lm/W)	I_{max} (cd)	S/MH (C0/180)	S/MH (C90/270)
4718.2	121.94	1621.1	1.22	1.21

Luminous Intensity Distribution



	C0/180	C45/225	C90/270	C135/315	AVG.
Beam Angle (50% I_{max}):	115.1	107.5	116.5	113.2	113.1
Field Angle (10% I_{max}):	175.1	175.0	175.3	175.6	175.3

Luminous Intensity (cd) Distribution Data

C γ	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	1495	1495	1495	1495	1495	1495	1495	1495
5.0°	1475	1578	1621	1572	1498	1493	1528	1547
10.0°	1462	1481	1466	1459	1471	1454	1481	1539
15.0°	1428	1477	1427	1546	1424	1525	1472	1409
20.0°	1397	1382	1405	1345	1380	1357	1371	1380
25.0°	1241	1241	1339	1344	1322	1339	1302	1288
30.0°	1295	1205	1183	1215	1207	1215	1211	1183
35.0°	1092	1128	1172	1114	1174	1152	1162	1146
40.0°	1151	1065	1105	1081	1090	1060	1043	1052
45.0°	921	1006	943	985	1030	983	953	995
50.0°	978	898	926	919	900	935	937	861
55.0°	840	802	791	806	851	788	797	794
60.0°	737	754	704	736	730	698	726	710
65.0°	664	632	621	614	610	636	609	602
70.0°	585	512	502	507	516	508	506	498
75.0°	454	427	399	415	425	401	389	385
80.0°	463	334	329	331	323	300	313	320
85.0°	283	300	281	321	273	290	270	230
90.0°	72	67	91	91	85	86	81	77
95.0°	19	19	20	21	22	20	20	20
100.0°	49	38	30	44	53	48	35	39
105.0°	39	28	25	47	60	50	27	28
110.0°	23	16	12	32	42	33	14	16
115.0°	3	6	4	17	23	17	5	5
120.0°	0	1	1	10	13	10	2	2
125.0°	0	0	1	8	11	10	1	0
130.0°	0	0	0	5	5	5	0	0
135.0°	0	0	0	2	2	3	1	0
140.0°	0	1	1	2	2	2	1	1
145.0°	1	1	1	2	2	2	2	1
150.0°	2	2	2	2	3	2	2	2
155.0°	2	2	3	3	3	3	3	3
160.0°	3	3	3	3	3	4	3	3
165.0°	3	3	4	4	4	4	4	4
170.0°	3	4	3	4	4	4	4	4
175.0°	4	4	4	4	4	4	4	4
180.0°	0	0	0	0	0	0	0	0

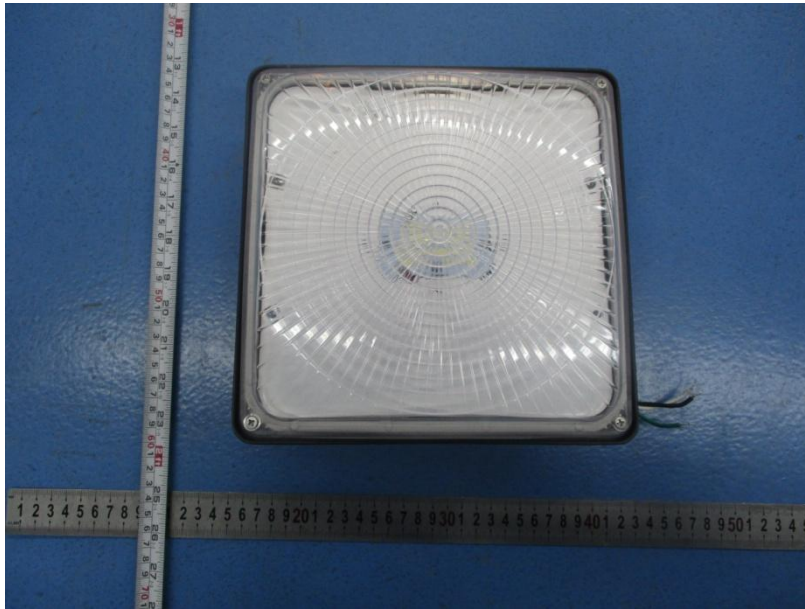
Luminous Intensity (cd) Distribution Data (cont.)

C γ	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	1495	1495	1495	1495	1495	1495	1495	1495
5.0°	1478	1452	1497	1488	1487	1568	1542	1454
10.0°	1470	1449	1564	1450	1468	1470	1522	1439
15.0°	1397	1436	1401	1499	1408	1482	1384	1479
20.0°	1380	1406	1340	1373	1357	1418	1376	1341
25.0°	1199	1214	1291	1330	1326	1317	1327	1224
30.0°	1216	1148	1227	1216	1217	1223	1209	1203
35.0°	1068	1120	1119	1122	1106	1133	1167	1151
40.0°	1056	1013	1078	1045	1095	1074	1104	1039
45.0°	911	968	937	991	982	1009	955	1010
50.0°	876	883	879	881	923	891	917	906
55.0°	757	778	774	752	796	782	792	806
60.0°	676	676	666	699	691	720	718	770
65.0°	571	585	579	564	574	591	618	644
70.0°	460	475	478	457	474	469	506	527
75.0°	339	377	371	386	408	392	399	412
80.0°	354	324	292	306	402	353	345	332
85.0°	201	200	221	216	209	242	237	302
90.0°	66	66	66	70	66	64	72	65
95.0°	20	18	19	23	25	23	17	18
100.0°	52	42	35	50	55	51	39	44
105.0°	35	29	24	44	58	48	27	30
110.0°	14	15	11	27	35	28	11	16
115.0°	2	4	4	14	20	15	4	5
120.0°	0	1	1	8	13	10	1	1
125.0°	0	0	0	8	11	11	0	0
130.0°	0	0	0	3	3	4	0	0
135.0°	0	0	0	2	2	2	0	0
140.0°	0	0	0	1	1	1	1	0
145.0°	1	0	1	1	2	1	1	1
150.0°	1	2	2	2	2	2	2	2
155.0°	2	2	2	2	2	2	3	3
160.0°	3	3	3	3	3	3	3	3
165.0°	3	3	4	3	3	4	3	4
170.0°	3	4	4	4	4	4	4	4
175.0°	4	4	4	4	4	4	4	4
180.0°	0	0	0	0	0	0	0	0

Zonal Lumen Density Measurement

Deg	Flux (lm)	%	Deg	Flux (lm)	%
0-5	36.0	0.76	0-5	36.0	0.76
5-10	107.1	2.27	0-10	143.2	3.03
10-15	173.6	3.68	0-15	316.8	6.71
15-20	232.8	4.93	0-20	549.6	11.65
20-25	279.6	5.93	0-25	829.2	17.57
25-30	316.5	6.71	0-30	1145.6	24.28
30-35	345.1	7.31	0-35	1490.7	31.60
35-40	367.8	7.80	0-40	1858.6	39.39
40-45	378.8	8.03	0-45	2237.3	47.42
45-50	380.0	8.05	0-50	2617.3	55.47
50-55	369.8	7.84	0-55	2987.2	63.31
55-60	348.4	7.38	0-60	3335.6	70.70
60-65	321.0	6.80	0-65	3656.5	77.50
65-70	280.0	5.93	0-70	3936.5	83.43
70-75	234.6	4.97	0-75	4171.1	88.41
75-80	197.3	4.18	0-80	4368.4	92.59
80-85	161.2	3.42	0-85	4529.7	96.00
85-90	90.0	1.91	0-90	4619.7	97.91
90-95	25.8	0.55	0-95	4645.4	98.46
95-100	17.4	0.37	0-100	4662.8	98.83
100-105	21.7	0.46	0-105	4684.6	99.29
105-110	15.4	0.33	0-110	4699.9	99.61
110-115	7.8	0.16	0-115	4707.7	99.78
115-120	3.4	0.07	0-120	4711.1	99.85
120-125	1.9	0.04	0-125	4713.0	99.89
125-130	1.1	0.02	0-130	4714.1	99.91
130-135	0.5	0.01	0-135	4714.6	99.92
135-140	0.3	0.01	0-140	4714.9	99.93
140-145	0.4	0.01	0-145	4715.3	99.94
145-150	0.5	0.01	0-150	4715.8	99.95
150-155	0.6	0.01	0-155	4716.3	99.96
155-160	0.6	0.01	0-160	4716.9	99.97
160-165	0.5	0.01	0-165	4717.4	99.98
165-170	0.4	0.01	0-170	4717.8	99.99
170-175	0.3	0.01	0-175	4718.1	100.00
175-180	0.0	0.00	0-180	4718.2	100.00

6. Product Photo



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