



Test Report Of ANSI/IES LM-79-19

APPROVED METHOD FOR OPTICAL AND ELECTRICAL MEASUREMENTS OF SOLID-STATE LIGHTING PRODUCTS

Report Number..... : N02A23121042L02701

Client..... : Beyond LED Technology

Address..... : 1939 Parker Court, Stone Mountain, GA 30087

Test Model..... : BLT-PL2X2-40W-A5C5-P

Brand Name..... : Beyond LED Technology

Testing Laboratory... : Guangdong Meide Testing Technology Co., Ltd.

Address..... : 1st floor, B Area, Jinbaisheng Industrial Park, Headquarters 2 Road, Songshan Lake Hi-tech Industrial Development Zone, Dongguan City, Guangdong Pr., China.

Testing Location..... : As above

Date of receipt..... : Dec. 25, 2023

Date of test : Jan. 22, 2024 - Jan. 25, 2024

Date of report..... : Mar. 04, 2024

Tested by:
Allen Chen
Allen Chen/ Test Engineer

Checked by:
Jarvis Zhang
Jarvis Zhang/ Project Engineer



Approved by:
Jessie Li
Jessie Li/ Technical Manager

Note 1: 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 use in part without prior written consent from Guangdong Meide Testing Technology Co., Ltd. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Note 2: This report does not imply product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

1. Product Description for Equipment under Test(EUT)

Representative (Tested) Model:	BLT-PL2X2-40W-A5C5-P
All Model:	BLT-PL2X2-40W-A5C5-P
Manufacturer:	Beyond LED Technology
Product Type:	Fuel Pump Canopy Luminaries
Rated Voltage/Frequency:	120-277V AC, 50/60Hz
Rated Power:	120/150/180/200W
Rated luminous flux:	16800/21000/25200/28000lm
Nominal CCT:	3000K/4000K/5000K/5700K/6500K
LED Manufacturer:	Lumileds Holding B.V.
LED Model No.:	L128-3080RA35002U1, L128-6580RA35002U1

2. Standards Used

- ANSI/IES LM-79-19:APPROVED METHOD:OPTICAL AND ELECTRICAL MEASUREMENTS OF SOLID-STATE LIGHTING PRODUCTS
- IES TM-30-18 IES Method for Evaluating Light Source Color Rendition (This Method is not in Nvlap accreditation scope)
- ANSI C82.77-10:2014 Harmonic Emission Limits – Related Power Quality Requirements for Lighting Equipment-Solid State

3. Test equipment list

Test Equipment	Serial No.	Model No.	Calibration due date
Full-field Speed Goniophotometer	MD-E028	GO-R5000	2024/09/16
Digital Power Meter	MD-E001	PF2010	2024/09/16
AC Testing Power Source	MD-E002	DPS1060	2024/09/16
Total Spectral Radiant Flux Standard Lamp	MD-E007	D908S	2024/09/25
Integrating Sphere System	MD-E029	2M	2024/09/16
High Accuracy Array Spectroradio Meter	MD-E011	HAAS-3000	2024/09/16
Digital Power Meter	MD-E008	PF310	2024/09/16
AC Testing Power Source	MD-E010	DPS1010	2024/09/16
Standard Lamp	MD-E036	D204	2024/09/25

Statement of Traceability: Guangdong Meide Testing Technology Co., Ltd. attested that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit(SI).

4. Test Method

Requirements of Ambient Condition

Product was tested with no seasoning. All stabilization and measurements were made in compliance with ANSI/IES LM-79-19. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C}\pm 1.2^{\circ}\text{C}$ during measurement. And relative humidity between 10% and 65%.

Goniophotometer System

The sample was tested according to the ANSI/IES LM-79-19.

Photometric parameters were measured using a type C goniophotometer and software. The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, Luminous efficacy, zonal flux were calculated from the software taken at 1° vertical intervals and 22.5° horizontal intervals. Photometric distance was more than five times of the Largest dimension of the test SSL product.

Integrating Sphere System

The sample was tested according to the ANSI/IES LM-79-19.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere. Coating reflectance of the integrating sphere was 90% to 98%. Photometric measurement conditions was using 4π geometry. The self-absorption factor is applied in the final test result. The sample was operated at rated voltage and was stabilized before measurement. Chromaticity coordinates, correlated color temperature and color rendering index were calculated from the spectral radiant flux measurements taken at 1 nm intervals over the range of 380 to 780 nm.

Fidelity Index (R_f) and Gamut Index (R_g) Calculation

The R_f , R_g was calculated according to IES TM-30-18 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.

THD and PF Test

The sample was tested according to the ANSI C82.77-10:2014.

The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

5. Integrating Sphere Test Results

5.1 Test Data

Test Ambient Temperature (Integrating sphere internal temperature)	25.3°C	Test orientation	Downward
Operate time(Min.)	60	stabilization time(Min.)	30

Optical and Electrical Measurement Result

Model	Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)	CCT (K)
CP06-200L-[D;S;X;S X]-30	119.94	60	1.673	200.2	0.9977	28274	141.23	2918
CP06-200L-[D;S;X;S X]-65	119.97	60	1.681	201.1	0.9977	31653	157.4	6672

Model	Ra	R9	Rf	Rg	x	y	u'	v'	Duv
CP06-200L-[D;S;X;S X]-30	84.8	15	86	97	0.4391	0.3985	0.2544	0.5195	-2.51E-03
CP06-200L-[D;S;X;S X]-65	85.3	14	84	92	0.3092	0.3321	0.1943	0.4694	6.54E-03

5.2 Model # CP06-200L-[D;S;X;SX]-30 Color Rendering Index

Ra				
84.8				
R1	R2	R3	R4	R5
85	94	94	83	85
R6	R7	R8	R9	R10
94	82	61	15	87
R11	R12	R13	R14	R15
84	80	87	98	77

***5.3.1 Model # CP06-200L-[D;S;X;SX]-30 ANSI/IES TM-30-18 Color Rendition Report**

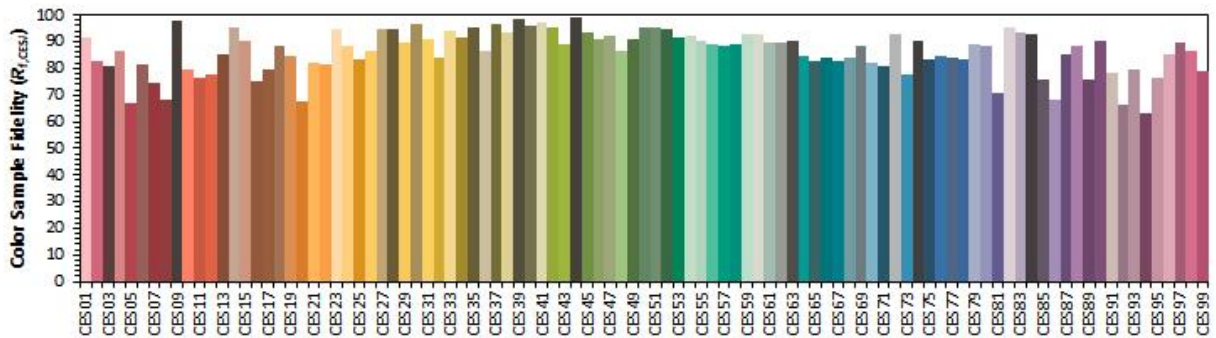
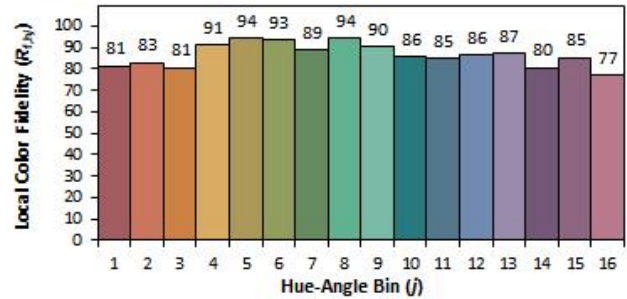
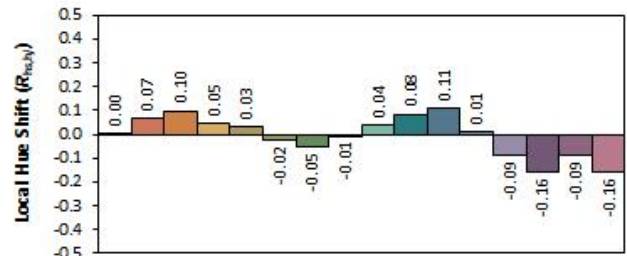
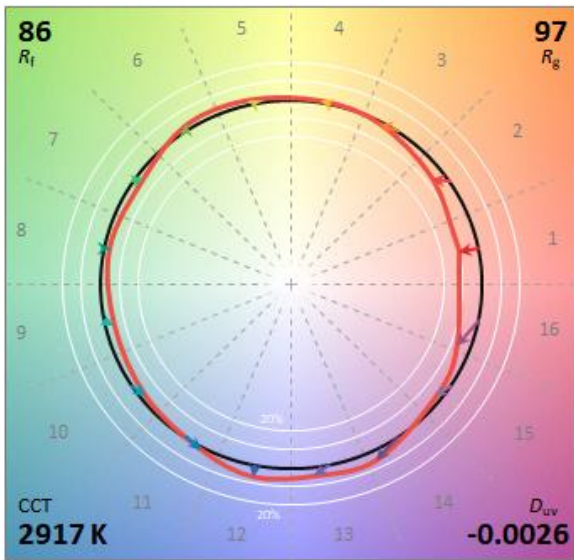
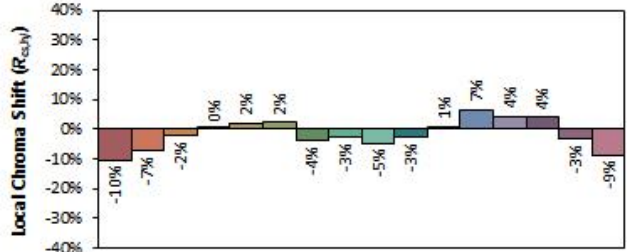
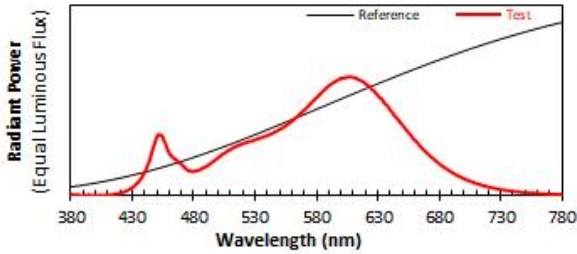
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-3080RA35002U1

Manufacturer: RZ LIGHTING CO LTD

Date: 2024/1/22

Model: CP06-200L-[D;S;X;SX]-30



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x **0.4391**
y **0.3984**
u' **0.2545**
v' **0.5194**

CIE 13.3-1995 (CRI)	
R _a	85
R ₉	15

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

***5.3.2 Model # CP06-200L-[D;S;X;SX]-65 ANSI/IES TM-30-18 Color Rendition Report**

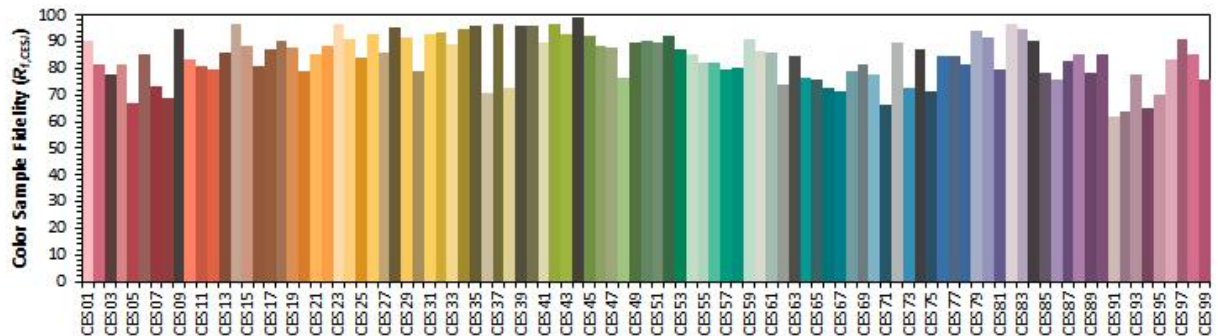
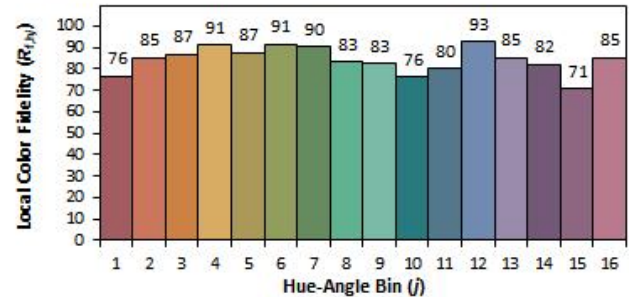
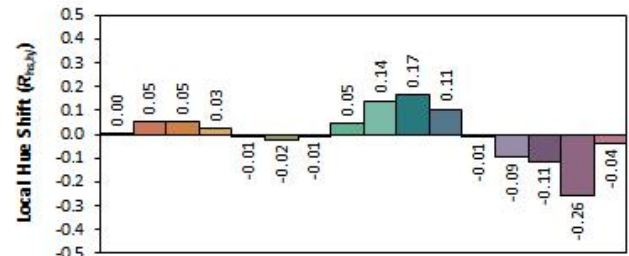
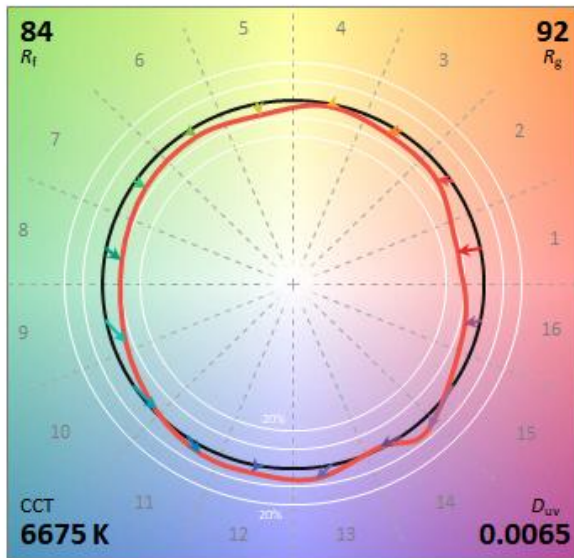
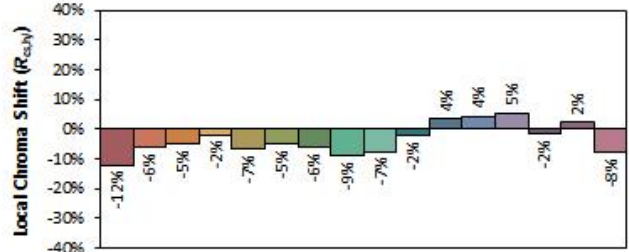
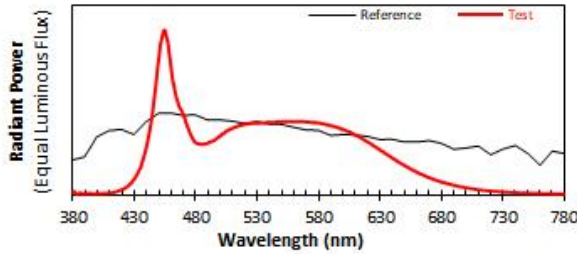
ANSI/IES TM-30-18 Color Rendition Report

Source: L128-6580RA35002U1

Manufacturer: RZ LIGHTING CO LTD

Date: 2024/1/25

Model: CP06-200L-[D;S;X;SX]-65



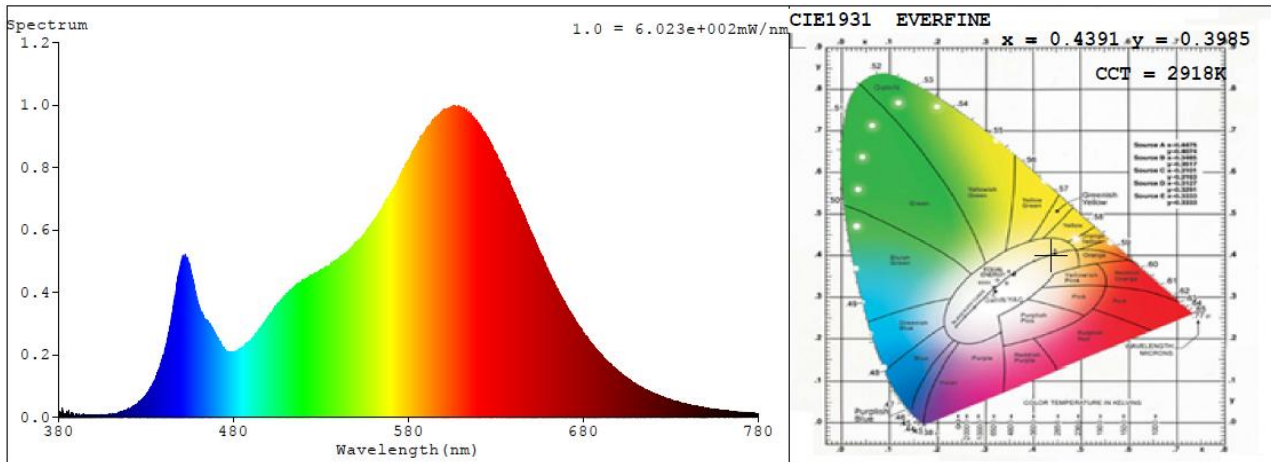
Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

x **0.3091**
y **0.3319**
u' **0.1943**
v' **0.4693**

CIE 13.3-1995 (CRI)	
R _a	85
R ₉	14

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.

5.4 Model # CP06-200L-[D;S;X;SX]-30 Relative Spectral Power Distribution



nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0064	414	0.0141	448	0.4373	482	0.2105	516	0.4228
381	0.0152	415	0.0163	449	0.4709	483	0.2169	517	0.43
382	0.0135	416	0.0189	450	0.4949	484	0.2165	518	0.429
383	0.0055	417	0.0191	451	0.5177	485	0.2215	519	0.4327
384	0.011	418	0.0215	452	0.5126	486	0.2265	520	0.4416
385	0.0122	419	0.0222	453	0.5115	487	0.2345	521	0.4428
386	0.011	420	0.0245	454	0.506	488	0.2377	522	0.4444
387	0.0037	421	0.0278	455	0.489	489	0.2425	523	0.4504
388	0.0068	422	0.0344	456	0.4572	490	0.2475	524	0.4529
389	0.0055	423	0.0349	457	0.4397	491	0.2543	525	0.4556
390	0.0084	424	0.0379	458	0.4064	492	0.26	526	0.4585
391	0.0083	425	0.0431	459	0.3849	493	0.2694	527	0.4604
392	0.005	426	0.0493	460	0.358	494	0.2741	528	0.4622
393	0.0067	427	0.0537	461	0.342	495	0.284	529	0.4698
394	0.0105	428	0.0582	462	0.338	496	0.2919	530	0.4729
395	0.0102	429	0.0642	463	0.3247	497	0.2981	531	0.4755
396	0.0068	430	0.0723	464	0.3125	498	0.307	532	0.4753
397	0.0064	431	0.0786	465	0.3112	499	0.3142	533	0.486
398	0.0056	432	0.0905	466	0.3004	500	0.3206	534	0.4856
399	0.006	433	0.0984	467	0.2893	501	0.3348	535	0.4853
400	0.0033	434	0.1122	468	0.286	502	0.337	536	0.493
401	0	435	0.1176	469	0.2753	503	0.3473	537	0.4987
402	0.0074	436	0.1339	470	0.2653	504	0.3566	538	0.4996
403	0.0081	437	0.1455	471	0.2553	505	0.3584	539	0.5037
404	0.0061	438	0.1629	472	0.2443	506	0.3648	540	0.5085
405	0.0068	439	0.1833	473	0.2373	507	0.3743	541	0.5108
406	0.0054	440	0.1952	474	0.2245	508	0.3802	542	0.5191
407	0.0059	441	0.2218	475	0.2189	509	0.3862	543	0.5211
408	0.0086	442	0.2491	476	0.21	510	0.3904	544	0.5238
409	0.0088	443	0.2719	477	0.2121	511	0.3958	545	0.5307
410	0.0066	444	0.298	478	0.2083	512	0.407	546	0.5367
411	0.0108	445	0.3345	479	0.207	513	0.4078	547	0.5417
412	0.0105	446	0.3735	480	0.2056	514	0.4164	548	0.5462
413	0.0123	447	0.4023	481	0.2121	515	0.417	549	0.5519

nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
550	0.5583	599	0.977	648	0.6176	697	0.1609	746	0.0343
551	0.5654	600	0.9873	649	0.6075	698	0.1583	747	0.0332
552	0.5672	601	0.9837	650	0.5962	699	0.1515	748	0.0314
553	0.5758	602	0.987	651	0.5851	700	0.1481	749	0.0303
554	0.584	603	0.9903	652	0.5684	701	0.1435	750	0.0297
555	0.5872	604	0.9932	653	0.5588	702	0.1376	751	0.0299
556	0.5981	605	0.9938	654	0.5445	703	0.1343	752	0.0288
557	0.603	606	0.9967	655	0.5321	704	0.1308	753	0.0277
558	0.6134	607	0.9977	656	0.5212	705	0.1261	754	0.0259
559	0.6185	608	0.9964	657	0.5095	706	0.1232	755	0.0261
560	0.6281	609	0.9946	658	0.4948	707	0.1195	756	0.0253
561	0.6349	610	0.994	659	0.4788	708	0.1137	757	0.0248
562	0.6436	611	0.9909	660	0.4712	709	0.1109	758	0.0239
563	0.6534	612	0.9877	661	0.4584	710	0.1089	759	0.0238
564	0.6636	613	0.9833	662	0.4503	711	0.1027	760	0.0216
565	0.6703	614	0.976	663	0.437	712	0.101	761	0.0216
566	0.6823	615	0.9729	664	0.4246	713	0.0982	762	0.0212
567	0.6954	616	0.9663	665	0.4136	714	0.0944	763	0.021
568	0.7	617	0.9628	666	0.4031	715	0.0907	764	0.0204
569	0.7096	618	0.9569	667	0.3911	716	0.0881	765	0.0197
570	0.7188	619	0.9504	668	0.3833	717	0.0862	766	0.019
571	0.731	620	0.9384	669	0.3698	718	0.0834	767	0.0181
572	0.7388	621	0.9352	670	0.3617	719	0.0823	768	0.0179
573	0.7474	622	0.9267	671	0.3509	720	0.0775	769	0.0173
574	0.7613	623	0.9152	672	0.3424	721	0.0761	770	0.0168
575	0.7727	624	0.9114	673	0.3325	722	0.0737	771	0.016
576	0.781	625	0.8941	674	0.3242	723	0.071	772	0.0161
577	0.7937	626	0.8887	675	0.3171	724	0.0688	773	0.0151
578	0.8024	627	0.8788	676	0.3052	725	0.0664	774	0.0143
579	0.8152	628	0.8667	677	0.2974	726	0.0642	775	0.0143
580	0.822	629	0.8551	678	0.2889	727	0.0625	776	0.0145
581	0.8325	630	0.8441	679	0.2816	728	0.0614	777	0.0141
582	0.8402	631	0.8319	680	0.2733	729	0.0596	778	0.014
583	0.8583	632	0.8206	681	0.2634	730	0.0561	779	0.0137
584	0.8644	633	0.8144	682	0.2556	731	0.0541	780	0.0138
585	0.8743	634	0.8019	683	0.25	732	0.0527		
586	0.8857	635	0.7848	684	0.2419	733	0.0514		
587	0.8942	636	0.7689	685	0.2354	734	0.0511		
588	0.9035	637	0.7646	686	0.2291	735	0.0485		
589	0.9145	638	0.7528	687	0.2199	736	0.047		
590	0.9222	639	0.7371	688	0.2147	737	0.045		
591	0.9319	640	0.7238	689	0.2068	738	0.0431		
592	0.9337	641	0.7093	690	0.2025	739	0.0423		
593	0.943	642	0.6996	691	0.1959	740	0.0412		
594	0.9507	643	0.6821	692	0.1893	741	0.0391		
595	0.9575	644	0.6685	693	0.1823	742	0.0381		
596	0.9604	645	0.6596	694	0.1777	743	0.0371		
597	0.9692	646	0.6462	695	0.1736	744	0.036		
598	0.9736	647	0.6365	696	0.1685	745	0.0355		

6. Goniophotometer Test results for Model # CP06-200L-[D;S;X;SX]-30

6.1 Test Data

Test Ambient Temperature	25.2°C	Test orientation	Downward
Operate time(Min.)	90	stabilization time(Min.)	30

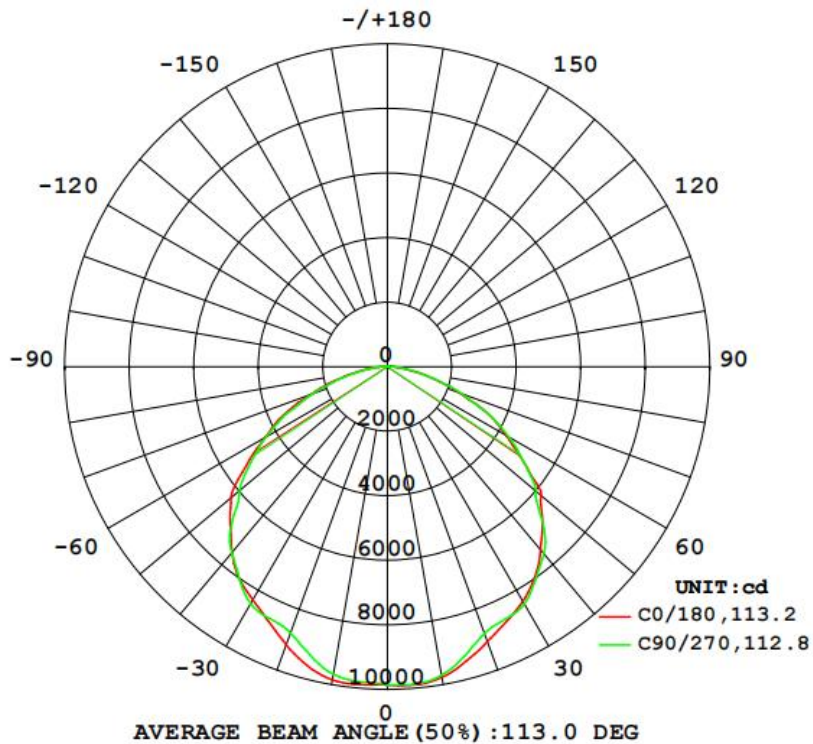
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
120.08	60	1.6707	0.9978	200.18

Optical Measurement

Luminous Flux (lm)	Efficacy(lm/W)	Imax (cd)	ZL (0-40°)	ZL (40-70°)
28240	141.07	9906	45%	47.1%

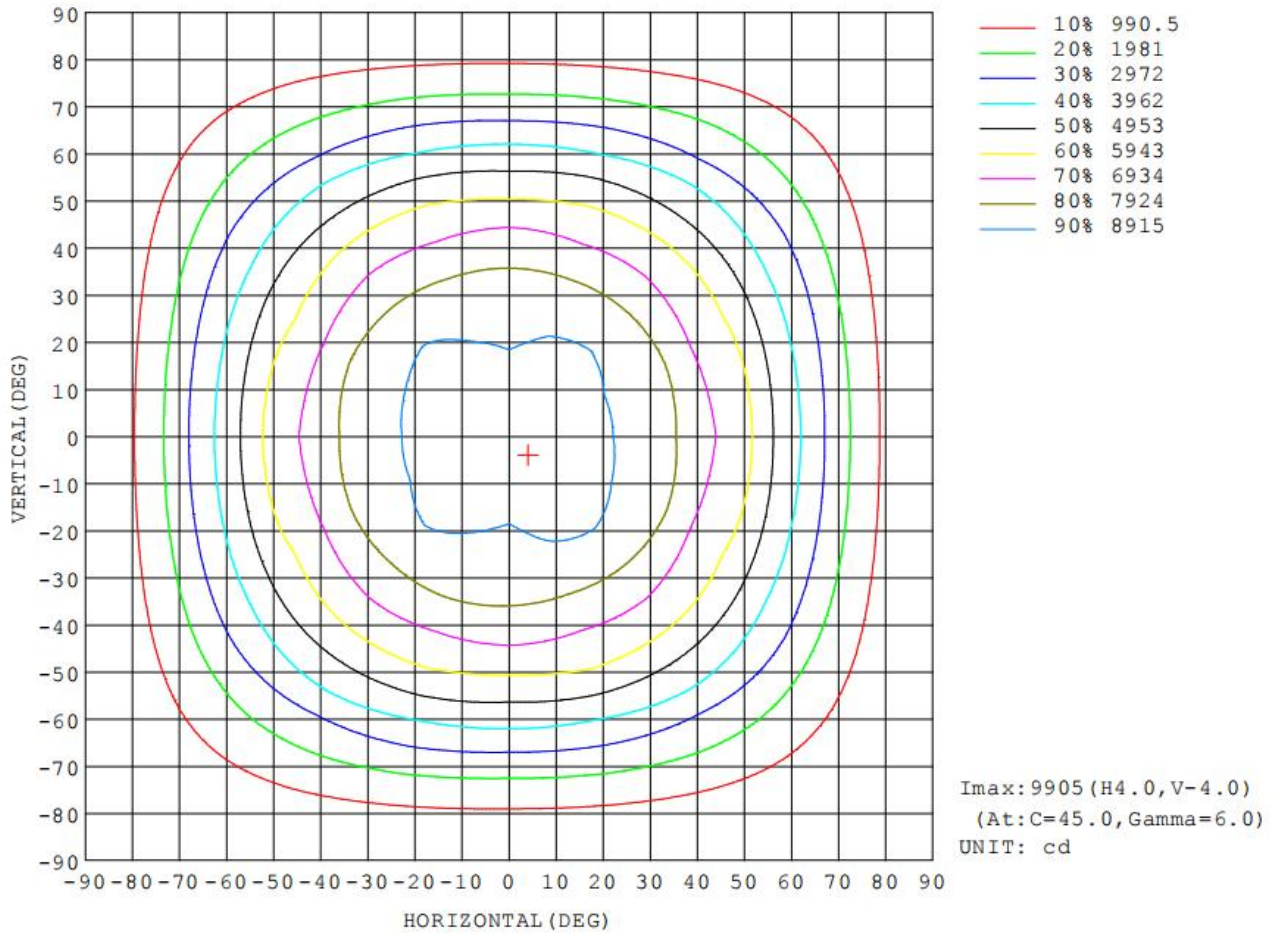
6.2 Luminous Intensity Distribution



6.3 Zonal Flux Diagram

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	#lum,lamp
10	9769	9824	9701	9755	9846	9832	9671	9714	0- 10	937.7	937.7	3.32,3.32
20	9066	9339	8800	9262	9172	9321	8782	9211	10- 20	2670	3608	12.8,12.8
30	8396	8580	8489	8565	8345	8614	8483	8526	20- 30	4068	7676	27.2,27.2
40	7393	7471	7558	7478	7496	7453	7514	7415	30- 40	5020	12696	45,45
50	6228	6090	6025	6077	6327	6101	5985	6046	40- 50	5201	17897	63.4,63.4
60	4259	4534	4348	4544	4357	4534	4333	4504	50- 60	4720	22617	80.1,80.1
70	2405	2450	2475	2516	2518	2506	2467	2467	60- 70	3388	26005	92.1,92.1
80	825.4	859.0	871.0	927.0	938.2	947.2	884.8	881.0	70- 80	1729	27734	98.2,98.2
90	57.33	99.36	63.56	105.8	108.5	130.4	98.55	104.3	80- 90	462.0	28196	99.8,99.8
100	1.894	1.918	1.937	1.884	3.446	3.472	3.472	3.425	90-100	15.18	28211	99.9,99.9
110	2.650	2.657	2.772	2.644	4.044	4.039	3.917	3.825	100-110	3.210	28214	99.9,99.9
120	3.694	3.701	4.242	3.794	4.039	4.073	4.243	3.919	110-120	3.567	28218	99.9,99.9
130	5.091	5.279	5.908	5.342	5.104	5.114	5.503	5.271	120-130	4.102	28222	99.9,99.9
140	6.546	6.600	7.116	6.694	7.532	7.578	7.702	7.843	130-140	4.837	28227	100,100
150	6.831	7.029	7.450	7.204	10.10	10.04	10.10	10.11	140-150	4.992	28232	100,100
160	7.284	8.289	8.545	8.300	11.06	11.29	11.81	11.55	150-160	4.287	28236	100,100
170	8.876	9.029	9.515	9.413	11.19	10.85	11.46	11.56	160-170	2.820	28239	100,100
180	11.56	11.56	10.48	10.48	10.48	10.48	11.56	11.56	170-180	0.9993	28240	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

6.4 Isocandela Diagram



6.5 Luminous Distribution Intensity Data

Table--1 UNIT: cd

C (DEG) γ (DEG)	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5			
0	9868	9868	9868	9868	9868	9868	9868	9868	9868	9868	9868	9868	9868	9868	9868	9868			
5	9896	9903	9905	9891	9869	9843	9823	9811	9880	9865	9846	9820	9801	9799	9803	9816			
10	9769	9792	9824	9782	9701	9706	9755	9772	9846	9851	9832	9739	9671	9701	9714	9690			
15	9449	9483	9603	9493	9269	9378	9509	9505	9592	9592	9617	9436	9262	9430	9481	9365			
20	9066	9152	9339	9152	8800	9031	9262	9114	9172	9220	9321	9034	8782	9089	9211	9025			
25	8725	8832	9030	8858	8638	8755	8976	8781	8713	8837	9008	8742	8613	8799	8913	8737			
30	8396	8490	8580	8524	8489	8500	8565	8441	8345	8475	8614	8502	8483	8491	8526	8391			
35	7972	8104	8045	7980	8025	8075	8046	8063	8012	8111	8080	7993	8006	7976	8007	8035			
40	7393	7379	7471	7400	7558	7470	7478	7493	7496	7517	7453	7404	7514	7382	7415	7359			
45	6809	6538	6770	6730	6812	6756	6801	6622	6890	6638	6829	6754	6815	6687	6700	6505			
50	6228	5984	6090	6077	6025	6080	6077	5986	6327	5985	6101	6081	5985	6033	6046	5998			
55	5176	5269	5252	5325	5171	5388	5323	5370	5351	5425	5326	5343	5169	5310	5221	5277			
60	4259	4243	4534	4326	4348	4391	4544	4391	4357	4409	4534	4374	4333	4312	4504	4259			
65	3440	3410	3343	3429	3427	3459	3441	3488	3560	3500	3453	3461	3424	3416	3343	3404			
70	2405	2383	2450	2458	2475	2511	2516	2525	2518	2586	2506	2506	2467	2458	2467	2432			
75	1515	1572	1547	1581	1595	1630	1618	1670	1677	1696	1673	1642	1612	1603	1564	1611			
80	825	833	859	870	871	908	927	924	938	946	947	915	885	887	881	865			
85	335	350	365	371	365	394	405	403	407	422	424	411	387	390	383	370			
90	57.3	65.3	99.4	90.0	63.6	88.9	106	106	108	120	130	116	98.5	92.2	104	86.5			
95	1.55	1.55	1.55	1.53	1.52	1.52	1.53	1.59	2.86	2.86	2.87	2.84	2.84	2.85	2.86	2.80			
100	1.89	1.91	1.92	1.92	1.94	1.90	1.88	1.96	3.45	3.47	3.47	3.46	3.47	3.43	3.43	3.35			
105	2.25	2.27	2.28	2.28	2.33	2.27	2.25	2.35	3.90	3.91	3.90	3.90	3.88	3.77	3.76	3.71			
110	2.65	2.68	2.66	2.70	2.77	2.68	2.64	2.74	4.04	4.06	4.04	3.96	3.92	3.84	3.82	3.80			
115	3.13	3.17	3.12	3.25	3.41	3.25	3.13	3.26	4.04	4.07	4.03	3.96	3.97	3.87	3.81	3.80			
120	3.69	3.76	3.70	3.98	4.24	3.98	3.79	3.77	4.04	4.09	4.07	4.12	4.24	4.06	3.92	3.87			
125	4.39	4.41	4.52	4.87	5.13	4.85	4.58	4.48	4.25	4.39	4.37	4.54	4.72	4.57	4.42	4.36			
130	5.09	5.18	5.28	5.73	5.91	5.69	5.34	5.42	5.10	5.19	5.11	5.36	5.50	5.43	5.27	5.26			
135	5.78	5.78	5.90	6.32	6.58	6.41	6.01	6.12	6.29	6.30	6.29	6.43	6.52	6.53	6.50	6.49			
140	6.55	6.51	6.60	6.72	7.12	6.95	6.69	6.61	7.53	7.47	7.58	7.61	7.70	7.70	7.84	7.91			
145	6.92	6.88	6.78	6.90	7.28	7.28	6.98	7.11	8.99	8.83	8.96	8.85	8.94	8.98	9.19	9.20			
150	6.83	6.87	7.03	7.19	7.45	7.65	7.20	7.23	10.1	10.0	10.0	10.1	10.1	10.1	10.1	10.1			
155	7.20	7.47	7.73	7.92	8.01	8.23	7.78	7.63	10.8	10.8	10.8	11.3	11.1	10.8	11.0	10.9			
160	7.28	7.77	8.29	8.27	8.55	8.62	8.30	7.97	11.1	11.1	11.3	11.7	11.8	11.5	11.5	11.4			
165	8.04	8.41	8.69	8.63	8.80	9.07	8.70	8.26	11.1	11.0	11.1	11.5	11.7	11.4	11.4	11.6			
170	8.88	8.69	9.03	9.26	9.52	9.69	9.41	8.89	11.2	11.1	10.9	11.1	11.5	11.5	11.6	11.5			
175	10.00	10.0	10.3	10.6	10.8	10.7	10.4	10.0	10.7	10.6	10.7	10.9	11.4	11.4	11.4	11.3			
180	11.6	11.6	11.6	11.6	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	11.6	11.6	11.6	11.6			

7. THD and PF Test

Model	Voltage (V AC)	Frequency (Hz)	Power Factor	THD (%)
CP06-200L-[D;S;X;SX] -30	120.0	60	0.998	2.02
	277.0	60	0.973	9.21
CP06-200L-[D;S;X;SX] -65	277.0	60	0.974	9.23

8. Photo of sample

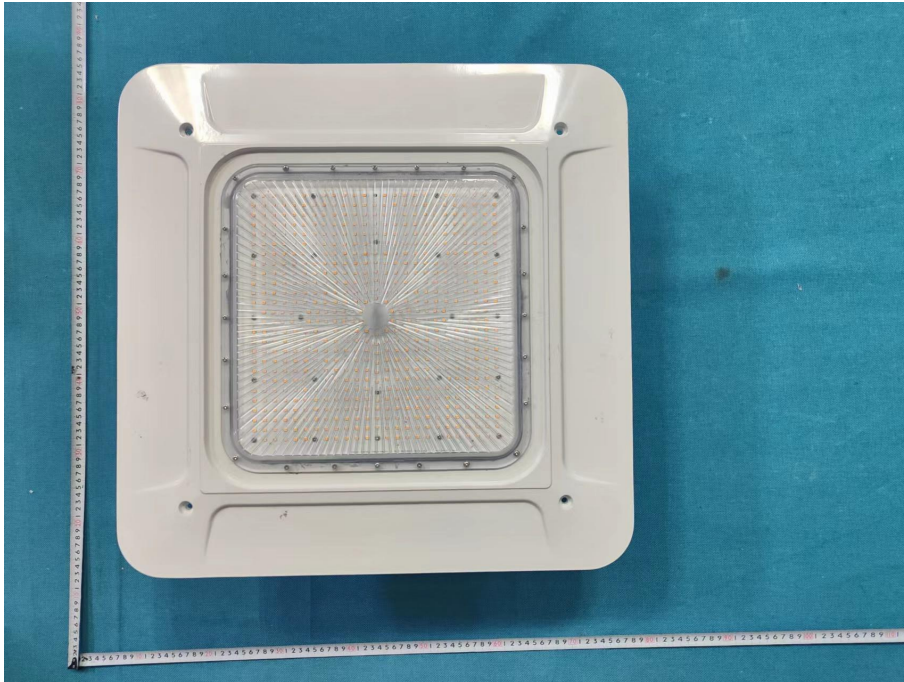


Figure 1

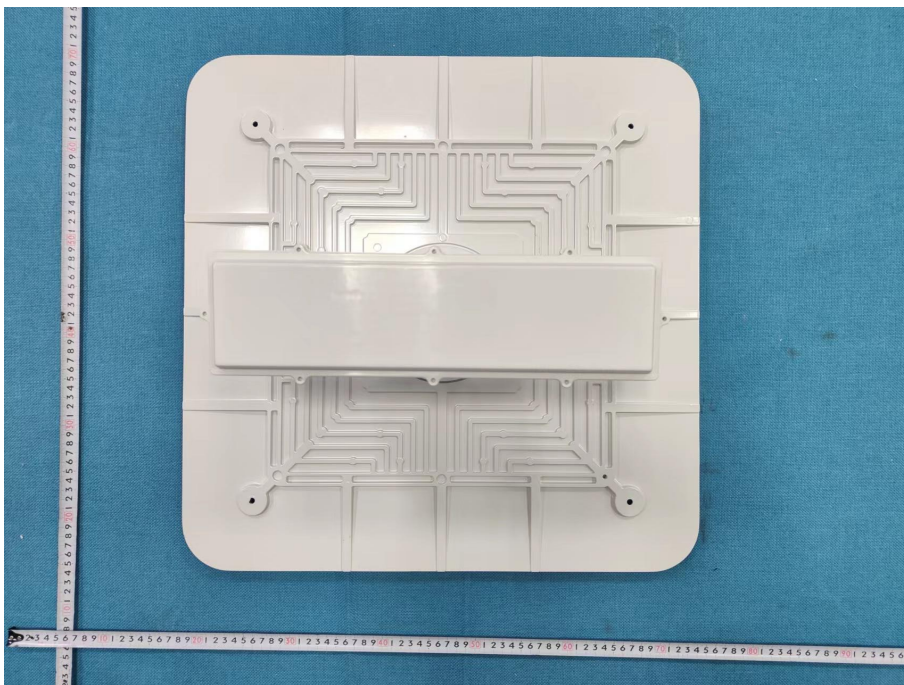


Figure 2

---End of Report---