



Guangdong Meide Testing Technology Co., Ltd.



TEST REPORT OF ANSI/IES LM-79-19

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

Client..... : Blackjack Lighting LLC

Address..... : 1547 Barclay Blvd Buffalo Grove, IL 60089

Test Model..... : SP-GGS-WH-03-BL-30K-2W

Brand Name..... : Blackjack Lighting

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

Report No..... : C02A21010685L01001

Test Date..... : Feb. 03, 2021

Report Date..... : Feb. 04, 2021

Tested by:

Tim

Tim Qian/ Test Engineer

Checked by:

Luke lei

Luke Lei/ Project Engineer

Approved by:



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.



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1. Product Description for Equipment under Test(EUT)

The client submitted 1 sample of model SP-GGS-WH-03-BL-30K-2W. Sample was numbered C02A21010685L01001-S01. The sample was received on 2021-02-02, is in undamaged condition.

Model Tested:	SP-GGS-WH-03-BL-30K-2W
Manufacturer:	Blackjack Lighting LLC
Product Type:	3" White Globe Pendant
Rated Voltage/Frequency:	120-277V AC, 50/60Hz
Rated Power:	3.3W
Rated luminous flux:	140lm
Nominal CCT:	3000K

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)

3. Test equipment list

Test Equipment	Serial No	Model No	Calibration due date
Full-field Speed Goniophotometer	MD-E028	GO-R5000	2021/09/29
Digital Power Meter	MD-E001	PF2010	2021/09/29
AC Testing Power Source	MD-E002	DPS1060	2021/09/29
Total Spectral Radiant Flux Standard Lamp	MD-E007	D908S	2021/09/29
Integrating Sphere System	MD-E029	2M	2021/09/29
High Accuracy Array Spectroradiometer	MD-E011	HAAS-3000	2021/09/29
Digital Power Meter	MD-E008	PF310	2021/09/29
AC Testing Power Source	MD-E010	DPS1010	2021/09/29
Standard Lamp	MD-E012	D204	2021/06/09

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).



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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_i) and Gamut Index (R_g) Calculation

The R_i , 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.



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5. Integrating Sphere Test Results

5.1 Test Data

Test Ambient Temperature	25.1℃	Test orientation	Downward
Operate time(Min.)	60	stabilization time(Min.)	45

Optical and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
119.9	60	0.03011	3.228	0.8936	147.47	45.69

CCT (K)	Ra	R9	x	y	u'	v'
2878	91.7	54	0.4463	0.4078	0.2550	0.5243

Color Rendering Index

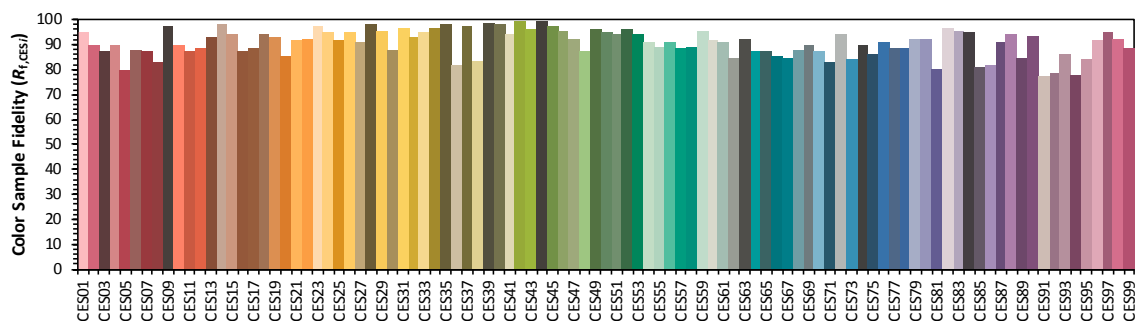
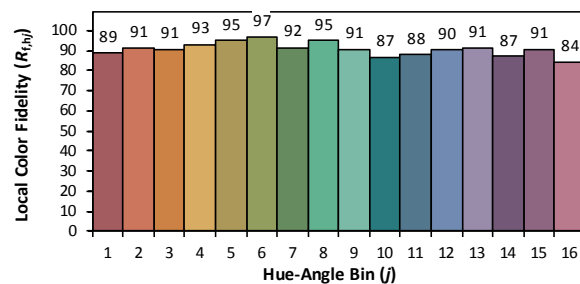
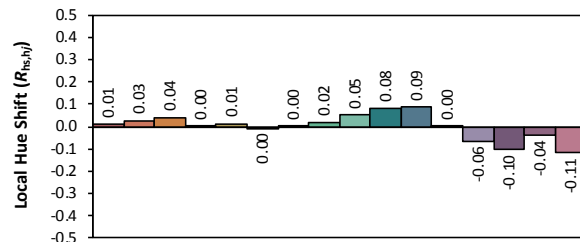
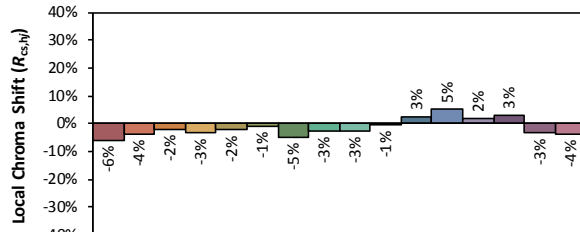
<div>Ra</div> <div>91.7</div>				
<div>R1</div> <div>92</div>	<div>R2</div> <div>97</div>	<div>R3</div> <div>99</div>	<div>R4</div> <div>91</div>	<div>R5</div> <div>91</div>
<div>R6</div> <div>96</div>	<div>R7</div> <div>90</div>	<div>R8</div> <div>79</div>	<div>R9</div> <div>54</div>	<div>R10</div> <div>91</div>
<div>R11</div> <div>91</div>	<div>R12</div> <div>81</div>	<div>R13</div> <div>93</div>	<div>R14</div> <div>100</div>	<div>R15</div> <div>87</div>



ANSI/IES TM-30-18 Color Rendition Report

Manufacturer: Blackjack Lighting LLC

Model: SP-GGS-WH-03-BL-30K-2W



x	0.4464
y	0.4078
u'	0.2551
v'	0.5242

R_a	92
R_9	54

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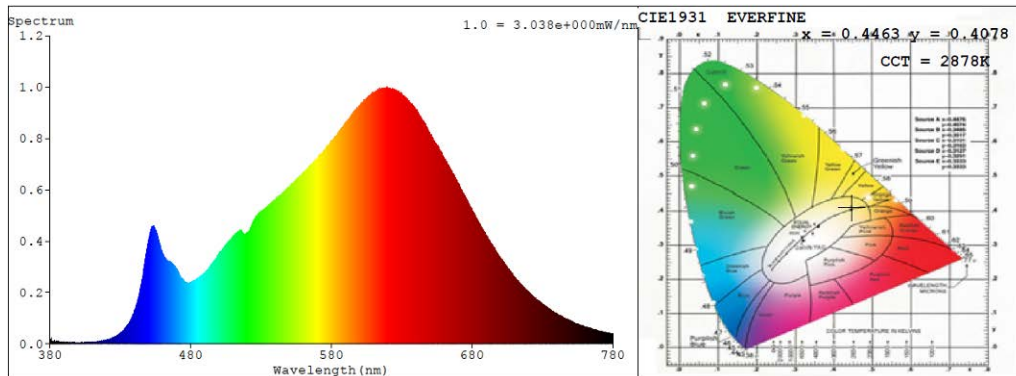
<http://www.meidetest.com/>



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Relative Spectral Power Distribution



nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0115	414	0.0088	448	0.3378	482	0.2426	516	0.4412
381	0.0142	415	0.0098	449	0.3711	483	0.2445	517	0.4321
382	0.0056	416	0.0094	450	0.4047	484	0.252	518	0.4242
383	0.0029	417	0.0129	451	0.4313	485	0.2523	519	0.4273
384	0.0022	418	0.0129	452	0.4435	486	0.2582	520	0.4316
385	0.0117	419	0.0137	453	0.4585	487	0.2636	521	0.4359
386	0.0096	420	0.0155	454	0.4547	488	0.2649	522	0.4437
387	0.002	421	0.0164	455	0.442	489	0.2721	523	0.456
388	0.0075	422	0.0174	456	0.4255	490	0.2751	524	0.4702
389	0.0052	423	0.0197	457	0.4064	491	0.2862	525	0.4816
390	0.0065	424	0.0222	458	0.3919	492	0.2869	526	0.492
391	0.004	425	0.0248	459	0.3673	493	0.2966	527	0.4983
392	0.0049	426	0.0272	460	0.3533	494	0.3038	528	0.5079
393	0.0044	427	0.0301	461	0.3429	495	0.3102	529	0.5129
394	0.0026	428	0.034	462	0.3329	496	0.3195	530	0.5188
395	0.0015	429	0.035	463	0.3235	497	0.3264	531	0.52
396	0.0054	430	0.0431	464	0.3228	498	0.3344	532	0.5242
397	0.0057	431	0.0479	465	0.3203	499	0.3416	533	0.5277
398	0.0044	432	0.0516	466	0.3177	500	0.3525	534	0.5315
399	0.0041	433	0.0594	467	0.3114	501	0.358	535	0.5376
400	0.0032	434	0.0662	468	0.3062	502	0.3635	536	0.5422
401	0.0026	435	0.0727	469	0.3005	503	0.3713	537	0.5463
402	0.0033	436	0.0792	470	0.2907	504	0.3788	538	0.5467
403	0.0058	437	0.092	471	0.2829	505	0.3825	539	0.5582
404	0.0049	438	0.1014	472	0.2662	506	0.3908	540	0.5613
405	0.0037	439	0.1142	473	0.2556	507	0.3981	541	0.5672
406	0.0041	440	0.1301	474	0.254	508	0.4049	542	0.5713
407	0.0048	441	0.1451	475	0.2479	509	0.4118	543	0.5766
408	0.0054	442	0.1624	476	0.2411	510	0.4187	544	0.578
409	0.0059	443	0.185	477	0.2381	511	0.4212	545	0.5867
410	0.0081	444	0.2111	478	0.2346	512	0.4293	546	0.589
411	0.0063	445	0.237	479	0.2345	513	0.4322	547	0.5927
412	0.0043	446	0.2677	480	0.2392	514	0.4384	548	0.5987
413	0.0083	447	0.3059	481	0.2414	515	0.4422	549	0.6076



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nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
550	0.6118	599	0.92	648	0.8404	697	0.3614	746	0.0991
551	0.6198	600	0.9272	649	0.8294	698	0.3532	747	0.0976
552	0.6234	601	0.9355	650	0.8177	699	0.3426	748	0.0946
553	0.6242	602	0.9379	651	0.812	700	0.335	749	0.0913
554	0.6331	603	0.9458	652	0.8025	701	0.3287	750	0.0884
555	0.6409	604	0.9512	653	0.7883	702	0.3208	751	0.086
556	0.6446	605	0.9571	654	0.7815	703	0.3121	752	0.0853
557	0.6509	606	0.9642	655	0.7746	704	0.3036	753	0.0824
558	0.6536	607	0.9651	656	0.7642	705	0.2973	754	0.0799
559	0.658	608	0.9689	657	0.755	706	0.2911	755	0.0775
560	0.6666	609	0.972	658	0.7452	707	0.2821	756	0.0739
561	0.6728	610	0.9783	659	0.7348	708	0.275	757	0.0722
562	0.6776	611	0.9807	660	0.7265	709	0.2695	758	0.0721
563	0.6841	612	0.9847	661	0.715	710	0.2618	759	0.0689
564	0.6883	613	0.9891	662	0.7104	711	0.2552	760	0.0662
565	0.6921	614	0.9929	663	0.6965	712	0.2489	761	0.0655
566	0.6986	615	0.9902	664	0.6852	713	0.2467	762	0.0631
567	0.7061	616	0.994	665	0.6784	714	0.235	763	0.0626
568	0.7098	617	0.9898	666	0.6685	715	0.2294	764	0.0614
569	0.7176	618	0.9937	667	0.6558	716	0.224	765	0.0593
570	0.7197	619	0.9926	668	0.6447	717	0.2187	766	0.0565
571	0.7283	620	0.9986	669	0.6356	718	0.21	767	0.0548
572	0.734	621	0.9931	670	0.6239	719	0.2074	768	0.0548
573	0.7409	622	0.9912	671	0.6157	720	0.1999	769	0.0523
574	0.749	623	0.9928	672	0.6034	721	0.1961	770	0.0498
575	0.7535	624	0.9909	673	0.5919	722	0.1924	771	0.0486
576	0.7629	625	0.9849	674	0.5848	723	0.1861	772	0.0485
577	0.7677	626	0.9821	675	0.5742	724	0.1818	773	0.0465
578	0.7733	627	0.9811	676	0.565	725	0.1782	774	0.0458
579	0.7807	628	0.981	677	0.5541	726	0.1717	775	0.0458
580	0.787	629	0.9703	678	0.5417	727	0.1667	776	0.0423
581	0.7925	630	0.972	679	0.5295	728	0.1646	777	0.0416
582	0.8018	631	0.9657	680	0.5196	729	0.1602	778	0.0408
583	0.8081	632	0.9613	681	0.5101	730	0.1544	779	0.0405
584	0.812	633	0.9523	682	0.502	731	0.1508	780	0.0386
585	0.8256	634	0.9535	683	0.4897	732	0.147		
586	0.8274	635	0.9428	684	0.482	733	0.144		
587	0.837	636	0.9386	685	0.4703	734	0.1382		
588	0.8446	637	0.9303	686	0.4586	735	0.1348		
589	0.8524	638	0.9271	687	0.4505	736	0.1317		
590	0.8631	639	0.9184	688	0.4407	737	0.1254		
591	0.8649	640	0.9116	689	0.4324	738	0.1242		
592	0.8741	641	0.9052	690	0.4242	739	0.1195		
593	0.88	642	0.895	691	0.4159	740	0.1168		
594	0.8918	643	0.884	692	0.4054	741	0.1151		
595	0.897	644	0.879	693	0.396	742	0.1104		
596	0.9049	645	0.869	694	0.3851	743	0.1079		
597	0.9094	646	0.8607	695	0.3776	744	0.1059		
598	0.9195	647	0.855	696	0.3728	745	0.1016		



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6. Goniophotometer Test results

6.1 Test Data

Test Ambient Temperature	25.1℃	Test orientation	Downward
Operate time(Min.)	90	stabilization time(Min.)	60

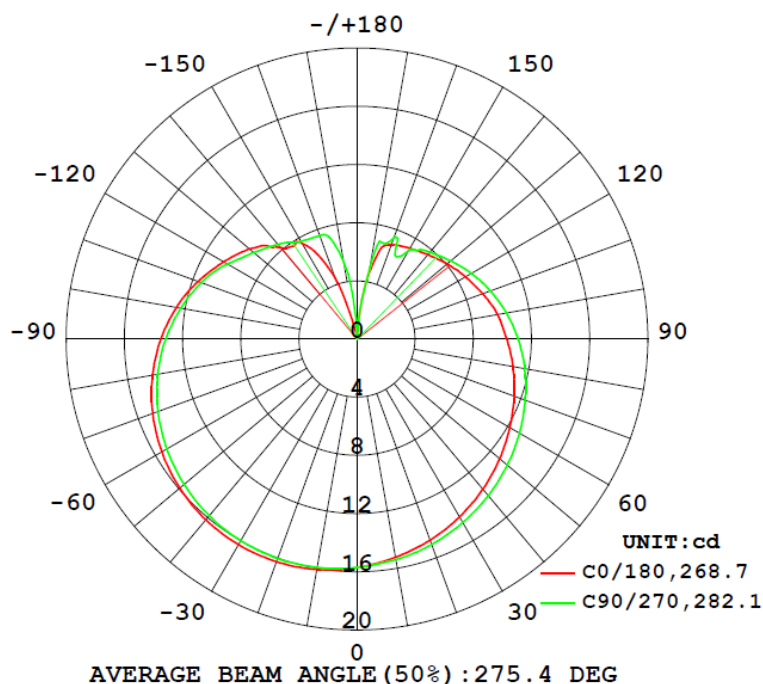
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
120.1	60	0.0302	0.8930	3.3

Optical Measurement

Luminous Flux (lm)	Efficacy(lm/W)	I _{max} (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
146.381	45.26	16.50	1.58	1.55

6.2 Luminous Intensity Distribution





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6.3 Zonal Flux Diagram

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	15.22	15.16	15.39	15.76	16.07	16.13	15.92	15.54	0- 10	1.496	1.496	1.02,1.02
20	14.69	14.57	15.01	15.69	16.27	16.39	16.04	15.32	10- 20	4.415	5.911	4.04,4.04
30	14.10	13.93	14.55	15.52	16.32	16.49	16.00	15.01	20- 30	7.114	13.03	6.9,6.9
40	13.46	13.24	14.04	15.25	16.20	16.43	15.84	14.60	30- 40	9.461	22.49	15.4,15.4
50	12.79	12.55	13.48	14.86	15.93	16.19	15.54	14.13	40- 50	11.35	33.84	23.1,23.1
60	12.13	11.86	12.89	14.40	15.52	15.81	15.12	13.60	50- 60	12.72	46.56	31.8,31.8
70	11.49	11.20	12.30	13.85	14.97	15.27	14.58	13.02	60- 70	13.52	60.08	41,41
80	10.88	10.59	11.70	13.22	14.29	14.58	13.93	12.40	70- 80	13.77	73.85	50.5,50.5
90	10.29	10.01	11.08	12.51	13.51	13.77	13.17	11.73	80- 90	13.48	87.33	59.7,59.7
100	9.814	9.476	10.43	11.71	12.63	12.85	12.32	11.04	90-100	12.71	100.0	68.3,68.3
110	9.192	8.958	9.753	10.85	11.64	11.85	11.42	10.38	100-110	11.53	111.6	76.2,76.2
120	8.609	8.439	9.064	9.971	10.63	10.80	10.34	9.618	110-120	10.03	121.6	83.1,83.1
130	8.073	7.982	8.392	9.122	9.674	9.747	9.283	8.857	120-130	8.333	129.9	88.8,88.8
140	7.591	7.494	7.811	8.394	8.214	8.876	8.513	8.184	130-140	6.605	136.5	93.3,93.3
150	7.232	7.168	7.039	7.521	7.620	7.883	7.770	7.691	140-150	4.918	141.5	96.6,96.6
160	6.867	6.353	7.429	5.571	4.476	4.690	7.585	7.360	150-160	3.216	144.7	98.8,98.8
170	4.472	3.862	4.893	2.513	0.0142	2.402	5.329	5.698	160-170	1.506	146.2	99.9,99.9
180	0.0464	0.0464	0.0290	0.0290	0.0290	0.0290	0.0464	0.0464	170-180	0.1957	146.4	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



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6.4 Luminous Distribution Intensity (cd) Data

Gamma\C	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
5.0°	15.47	15.42	15.43	15.47	15.54	15.64	15.73	15.82
10.0°	15.22	15.15	15.16	15.25	15.39	15.56	15.76	15.92
15.0°	14.96	14.86	14.88	15	15.22	15.47	15.74	15.98
20.0°	14.69	14.56	14.57	14.73	15.01	15.35	15.69	16.01
25.0°	14.41	14.24	14.26	14.45	14.79	15.2	15.62	16
30.0°	14.1	13.9	13.93	14.16	14.55	15.03	15.52	15.96
35.0°	13.79	13.56	13.59	13.85	14.3	14.84	15.4	15.89
40.0°	13.46	13.21	13.24	13.54	14.04	14.64	15.25	15.78
45.0°	13.13	12.86	12.9	13.22	13.77	14.41	15.07	15.64
50.0°	12.79	12.5	12.55	12.9	13.48	14.18	14.86	15.47
55.0°	12.46	12.16	12.2	12.57	13.19	13.92	14.64	15.27
60.0°	12.13	11.81	11.86	12.25	12.89	13.66	14.4	15.04
65.0°	11.81	11.48	11.53	11.93	12.6	13.37	14.13	14.77
70.0°	11.49	11.16	11.2	11.61	12.3	13.09	13.85	14.49
75.0°	11.18	10.84	10.89	11.31	12	12.79	13.55	14.17
80.0°	10.88	10.54	10.59	11.02	11.7	12.48	13.22	13.83
85.0°	10.58	10.26	10.3	10.73	11.39	12.15	12.87	13.46
90.0°	10.29	9.974	10.01	10.43	11.08	11.81	12.51	13.07
95.0°	10.03	9.702	9.74	10.15	10.76	11.46	12.12	12.66
100.0°	9.814	9.441	9.476	9.859	10.43	11.1	11.71	12.22
105.0°	9.511	9.219	9.219	9.569	10.09	10.72	11.29	11.77
110.0°	9.192	8.99	8.958	9.276	9.753	10.33	10.85	11.3
115.0°	8.882	8.705	8.7	8.987	9.41	9.942	10.41	10.81
120.0°	8.609	8.424	8.439	8.698	9.064	9.547	9.971	10.34
125.0°	8.337	8.147	8.201	8.419	8.721	9.163	9.539	9.869
130.0°	8.073	7.902	7.982	8.148	8.392	8.788	9.122	9.419
135.0°	7.825	7.671	7.734	7.876	8.084	8.438	8.741	8.88
140.0°	7.591	7.459	7.494	7.631	7.811	8.131	8.394	8.391
145.0°	7.387	7.278	7.312	7.434	7.563	7.763	8.031	7.992
150.0°	7.232	7.142	7.168	7.259	7.039	7.225	7.521	7.389
155.0°	7.097	7.028	6.935	6.807	6.303	6.994	6.825	6.228
160.0°	6.867	6.632	6.353	6.079	7.429	6.708	5.571	4.69
165.0°	6.564	6.135	5.719	5.763	6.868	6.138	4.314	2.421
170.0°	4.472	4.223	3.862	3.715	4.893	3.924	2.513	0.614
175.0°	1.284	1.256	0.887	0.502	0.579	0.76	0.741	0.031
180.0°	0.046	0.046	0.046	0.046	0.029	0.029	0.029	0.029



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Gamma/C	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
5.0°	15.9	15.92	15.93	15.89	15.81	15.72	15.63	15.53
10.0°	16.07	16.12	16.13	16.05	15.92	15.75	15.54	15.35
15.0°	16.19	16.28	16.28	16.2	16	15.73	15.44	15.16
20.0°	16.27	16.39	16.39	16.28	16.04	15.71	15.32	14.96
25.0°	16.31	16.46	16.46	16.32	16.04	15.64	15.18	14.74
30.0°	16.32	16.49	16.49	16.33	16	15.54	15.01	14.49
35.0°	16.28	16.48	16.48	16.3	15.94	15.42	14.81	14.23
40.0°	16.2	16.42	16.43	16.24	15.84	15.27	14.6	13.95
45.0°	16.09	16.32	16.33	16.13	15.71	15.1	14.38	13.67
50.0°	15.93	16.17	16.19	15.99	15.54	14.9	14.13	13.38
55.0°	15.74	15.99	16.02	15.81	15.34	14.67	13.87	13.08
60.0°	15.52	15.77	15.81	15.59	15.12	14.43	13.6	12.77
65.0°	15.26	15.51	15.55	15.34	14.87	14.16	13.31	12.47
70.0°	14.97	15.22	15.27	15.06	14.58	13.88	13.02	12.17
75.0°	14.65	14.9	14.94	14.73	14.27	13.57	12.72	11.86
80.0°	14.29	14.54	14.58	14.38	13.93	13.24	12.4	11.55
85.0°	13.91	14.14	14.19	13.99	13.56	12.9	12.07	11.24
90.0°	13.51	13.73	13.77	13.57	13.17	12.53	11.73	10.94
95.0°	13.08	13.28	13.32	13.14	12.76	12.15	11.39	10.63
100.0°	12.63	12.81	12.85	12.69	12.32	11.75	11.04	10.35
105.0°	12.16	12.32	12.36	12.21	11.88	11.35	10.69	10.03
110.0°	11.64	11.81	11.85	11.73	11.42	10.93	10.38	9.692
115.0°	11.13	11.3	11.34	11.21	10.92	10.52	10.01	9.35
120.0°	10.63	10.79	10.8	10.63	10.34	10.09	9.618	9.033
125.0°	10.14	10.29	10.26	9.951	9.743	9.668	9.239	8.719
130.0°	9.674	9.805	9.747	9.383	9.283	9.258	8.857	8.412
135.0°	9.112	9.367	9.293	8.915	8.884	8.862	8.5	8.124
140.0°	8.214	8.863	8.876	8.508	8.513	8.509	8.184	7.854
145.0°	7.797	8.208	8.491	7.94	8.129	8.213	7.908	7.62
150.0°	7.62	7.461	7.883	7.504	7.77	7.956	7.691	7.443
155.0°	6.417	6.453	6.76	7.033	7.643	7.73	7.508	7.295
160.0°	4.476	4.615	4.69	6.115	7.585	7.538	7.36	7.135
165.0°	1.347	2.362	3.9	5.583	7.172	7.303	7.195	6.905
170.0°	0.014	0.487	2.402	3.865	5.329	5.74	5.698	5.222
175.0°	0.021	0.05	1.156	1.987	2.126	2.313	2.369	2.027
180.0°	0.029	0.029	0.029	0.029	0.046	0.046	0.046	0.046



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7. Photo of Sample

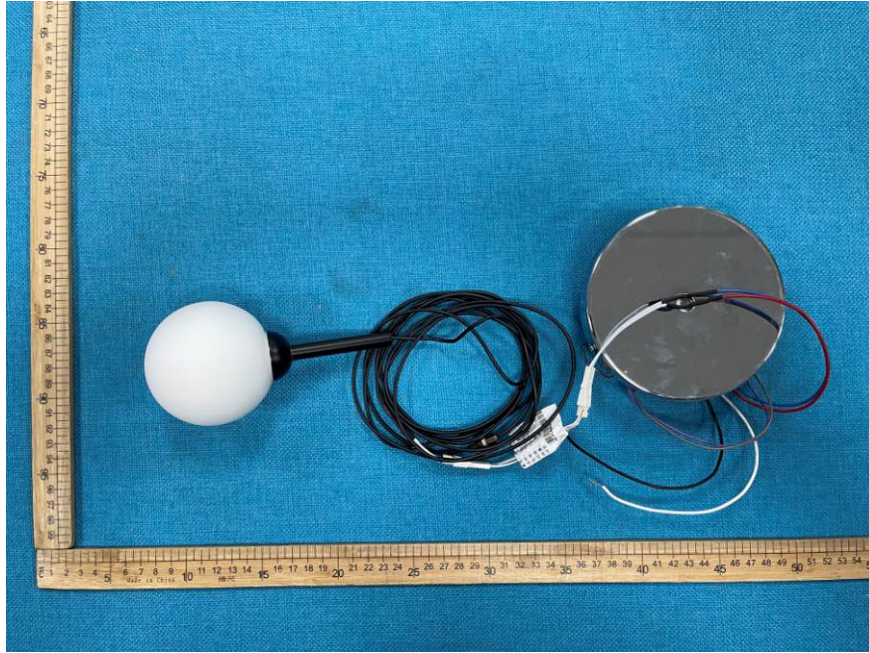


Figure 1

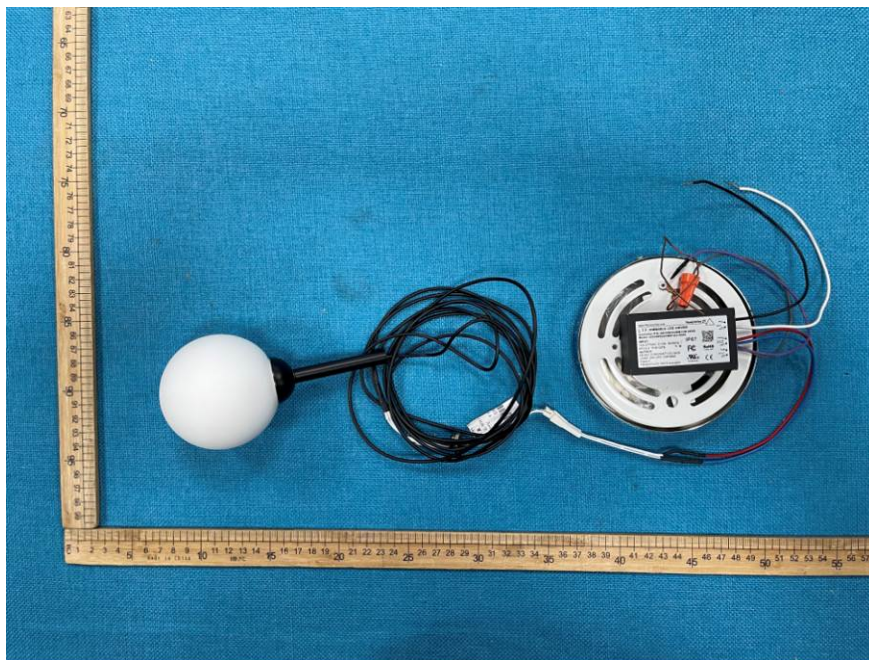


Figure 2

***** END OF THE TEST REPORT*****