



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-LGD-TF-01-PC-30K-3W

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..... : C02A21010664L02001

Test Date..... : Jan. 28, 2021 – Jan. 29, 2021

Report Date..... : Jan. 29, 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-LGD-TF-01-PC-30K-3W. Sample was numbered C02A21010664L02001-S01. The sample was received on 2021-01-28 is undamaged condition.

Model Tested:	SP-LGD-TF-01-PC-30K-3W
Manufacturer:	Blackjack Lighting LLC
Manufacturer address:	1547 Barclay Blvd Buffalo Grove, IL 60089
Product Type:	Tall Frosted Light Guide Pendant
Rated Voltage/Frequency:	120-277V AC , 50/60Hz
Rated Power:	4.2W
Rated luminous flux:	130lm
Nominal CCT:	3000K
LED Manufacturer:	N/A
LED Model No:	N/A

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 Spectroradio Meter	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).

Report No.: C02A21010664L02001

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Laboratory: Guangdong Meide Testing Technology Co., Ltd.

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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_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.



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5. Integrating Sphere Test Results

5.1 Test Data

Test Ambient Temperature	25.1℃	Test orientation	Downward
Operate time(Min.)	75	stabilization time(Min.)	60

Optical and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60.0	0.03770	4.141	0.9156	133.60	32.26

CCT (K)	Ra	R9	x	y	u'	v'
2890	92.5	61	0.4457	0.4081	0.2545	0.5243

5.2 Color Rendering Index

<div>Ra</div> <div>92.5</div>				
<div>R1</div> <div>93</div>	<div>R2</div> <div>95</div>	<div>R3</div> <div>97</div>	<div>R4</div> <div>93</div>	<div>R5</div> <div>92</div>
<div>R6</div> <div>94</div>	<div>R7</div> <div>93</div>	<div>R8</div> <div>83</div>	<div>R9</div> <div>61</div>	<div>R10</div> <div>88</div>
<div>R11</div> <div>94</div>	<div>R12</div> <div>81</div>	<div>R13</div> <div>93</div>	<div>R14</div> <div>97</div>	<div>R15</div> <div>89</div>



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5.3 ANSI/IES TM-30-18 Color Rendition Report

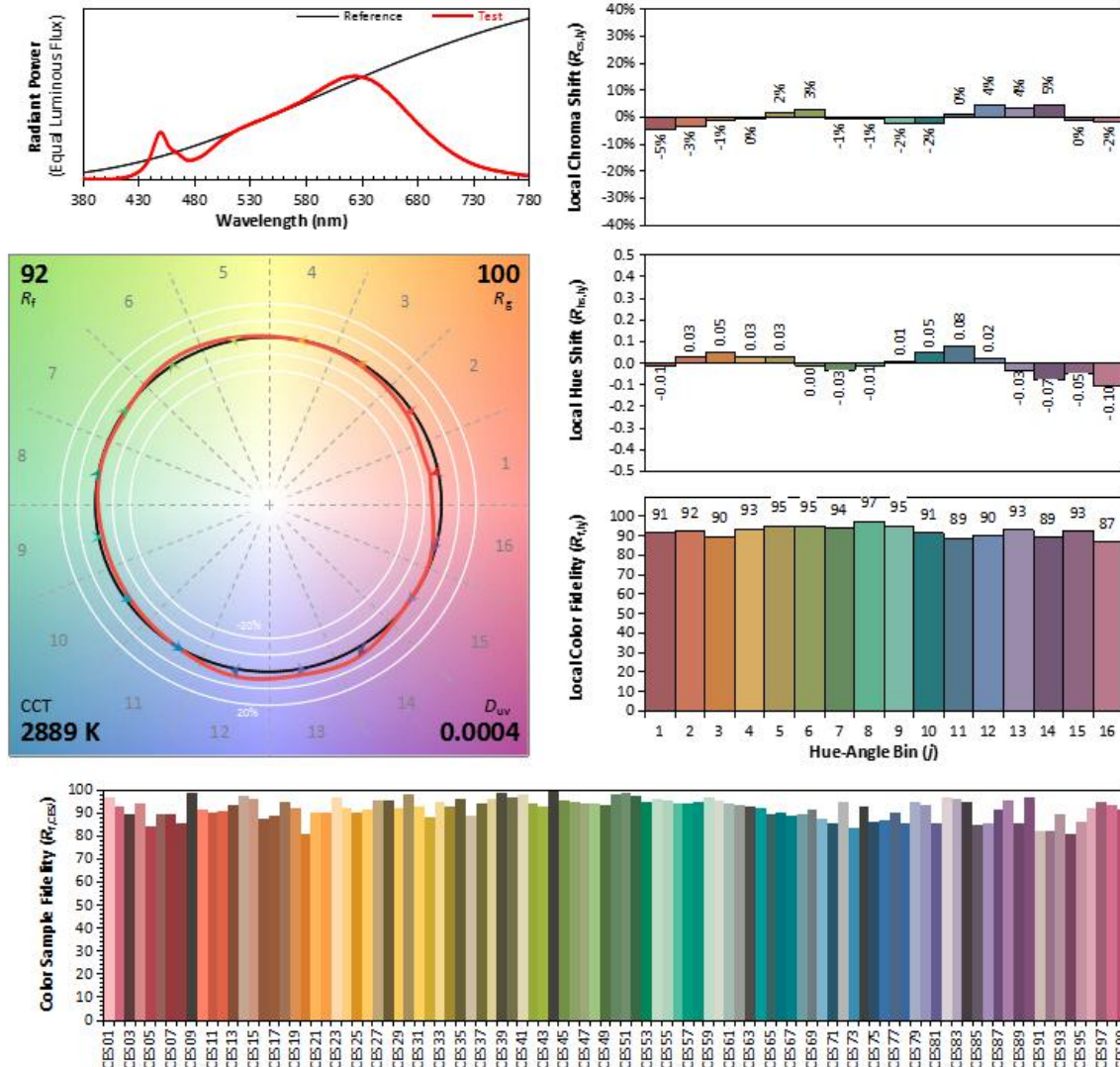
ANSI/IES TM-30-18 Color Rendition Report

Source: N/A

Date: 2021/1/29

Manufacturer: Blackjack Lighting LLC

Model: SP-LGD-TF-01-PC-30K-3W



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

x 0.4457
 y 0.4080
 u' 0.2545
 v' 0.5242

CIE 13.3-1995
(CRI)
 R_a 93
 R_g 61

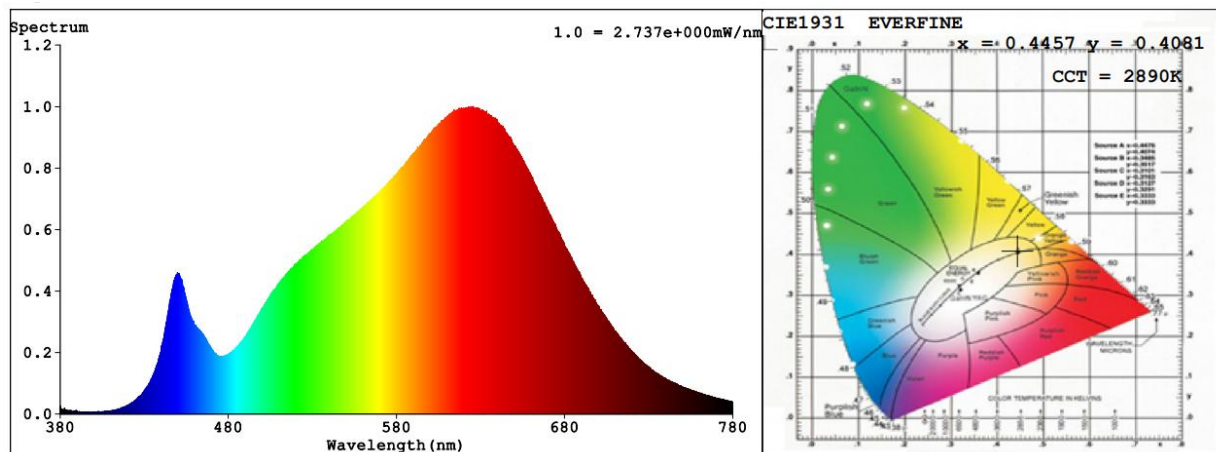
Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



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5.4 Relative Spectral Power Distribution



nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0255	414	0.0132	448	0.4382	482	0.2011	516	0.463
381	0.0139	415	0.0155	449	0.4522	483	0.2072	517	0.4689
382	0.0107	416	0.0185	450	0.4545	484	0.2102	518	0.472
383	0.0064	417	0.0188	451	0.4518	485	0.2171	519	0.4774
384	0.0024	418	0.023	452	0.4383	486	0.2219	520	0.4891
385	0.0037	419	0.0239	453	0.4151	487	0.228	521	0.4897
386	0.0085	420	0.0257	454	0.3945	488	0.2351	522	0.4948
387	0.0092	421	0.0305	455	0.3723	489	0.2399	523	0.5016
388	0.0065	422	0.0331	456	0.3471	490	0.2506	524	0.5035
389	0.005	423	0.0352	457	0.3255	491	0.259	525	0.5128
390	0.0101	424	0.0399	458	0.3127	492	0.2665	526	0.5156
391	0.0043	425	0.0457	459	0.3014	493	0.2752	527	0.5179
392	0.0058	426	0.0524	460	0.2896	494	0.286	528	0.5238
393	0.0063	427	0.0551	461	0.2817	495	0.2934	529	0.5295
394	0.0045	428	0.0606	462	0.2766	496	0.3051	530	0.5336
395	0.0053	429	0.0686	463	0.2739	497	0.3121	531	0.5381
396	0.0038	430	0.0756	464	0.2588	498	0.3227	532	0.5436
397	0.0058	431	0.0817	465	0.2604	499	0.3294	533	0.5482
398	0.0018	432	0.0893	466	0.2484	500	0.3428	534	0.5537
399	0.0059	433	0.0987	467	0.2415	501	0.3487	535	0.5589
400	0.0059	434	0.1102	468	0.2273	502	0.3593	536	0.5599
401	0.006	435	0.1239	469	0.2225	503	0.3658	537	0.5657
402	0.0063	436	0.1351	470	0.2108	504	0.3775	538	0.5666
403	0.0046	437	0.1511	471	0.2048	505	0.3843	539	0.5765
404	0.0072	438	0.1655	472	0.1978	506	0.3953	540	0.5782
405	0.0043	439	0.1869	473	0.1907	507	0.3991	541	0.5805
406	0.007	440	0.2044	474	0.1893	508	0.4074	542	0.5842
407	0.0084	441	0.2337	475	0.1868	509	0.4172	543	0.5894
408	0.0078	442	0.2592	476	0.1874	510	0.4225	544	0.5964
409	0.0095	443	0.2956	477	0.1866	511	0.4297	545	0.6005
410	0.0093	444	0.3262	478	0.1869	512	0.4391	546	0.6058
411	0.0103	445	0.3548	479	0.1915	513	0.4399	547	0.6094
412	0.0124	446	0.3881	480	0.1922	514	0.4495	548	0.6126
413	0.0132	447	0.4123	481	0.1964	515	0.4581	549	0.6206



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nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
550	0.6248	599	0.902	648	0.8979	697	0.377	746	0.0982
551	0.6314	600	0.9081	649	0.8789	698	0.3702	747	0.0967
552	0.6315	601	0.9156	650	0.871	699	0.358	748	0.0915
553	0.6385	602	0.9214	651	0.8641	700	0.3513	749	0.0901
554	0.6366	603	0.9273	652	0.853	701	0.3413	750	0.0889
555	0.6461	604	0.9301	653	0.8488	702	0.3335	751	0.0858
556	0.651	605	0.9396	654	0.8382	703	0.3248	752	0.0843
557	0.6561	606	0.9409	655	0.8309	704	0.3194	753	0.0825
558	0.6608	607	0.9474	656	0.8132	705	0.3103	754	0.0811
559	0.6661	608	0.9526	657	0.8045	706	0.3009	755	0.0792
560	0.6703	609	0.9614	658	0.7956	707	0.2934	756	0.0752
561	0.6737	610	0.9639	659	0.7832	708	0.286	757	0.0748
562	0.6813	611	0.9692	660	0.7768	709	0.2784	758	0.072
563	0.685	612	0.9761	661	0.7688	710	0.269	759	0.07
564	0.6897	613	0.9803	662	0.7492	711	0.2631	760	0.0692
565	0.6937	614	0.9778	663	0.7406	712	0.2568	761	0.0663
566	0.6974	615	0.9794	664	0.7287	713	0.247	762	0.0649
567	0.7073	616	0.9851	665	0.72	714	0.2401	763	0.0631
568	0.7086	617	0.9866	666	0.7066	715	0.2354	764	0.0612
569	0.7164	618	0.9869	667	0.6954	716	0.2294	765	0.0612
570	0.7215	619	0.991	668	0.6866	717	0.2219	766	0.0591
571	0.7257	620	0.994	669	0.6695	718	0.2152	767	0.0563
572	0.7298	621	0.9932	670	0.6624	719	0.2106	768	0.0553
573	0.737	622	0.9915	671	0.6499	720	0.2032	769	0.0537
574	0.7414	623	0.9972	672	0.6402	721	0.1965	770	0.0519
575	0.7452	624	0.9972	673	0.6254	722	0.1925	771	0.051
576	0.7526	625	0.9965	674	0.6185	723	0.1863	772	0.0496
577	0.7585	626	0.9956	675	0.6069	724	0.1805	773	0.0459
578	0.7661	627	0.9937	676	0.5948	725	0.1763	774	0.0457
579	0.7732	628	0.9902	677	0.5824	726	0.1709	775	0.0432
580	0.7778	629	0.989	678	0.5723	727	0.1656	776	0.0437
581	0.786	630	0.9861	679	0.5619	728	0.161	777	0.0425
582	0.7926	631	0.989	680	0.5454	729	0.157	778	0.0403
583	0.7969	632	0.9829	681	0.5392	730	0.1528	779	0.0404
584	0.8038	633	0.9825	682	0.5265	731	0.1481	780	0.0385
585	0.811	634	0.9744	683	0.5205	732	0.142		
586	0.8205	635	0.9749	684	0.51	733	0.1385		
587	0.8234	636	0.9693	685	0.4945	734	0.1351		
588	0.8314	637	0.9624	686	0.4856	735	0.1315		
589	0.8387	638	0.9625	687	0.4768	736	0.1273		
590	0.8434	639	0.9599	688	0.4656	737	0.1249		
591	0.8512	640	0.9517	689	0.4556	738	0.122		
592	0.8568	641	0.9417	690	0.4424	739	0.1175		
593	0.8597	642	0.9393	691	0.4336	740	0.1138		
594	0.8735	643	0.9301	692	0.4253	741	0.1121		
595	0.8785	644	0.9267	693	0.4168	742	0.1091		
596	0.8832	645	0.9158	694	0.407	743	0.106		
597	0.8929	646	0.9087	695	0.3964	744	0.1048		
598	0.8955	647	0.9025	696	0.3874	745	0.1004		



6. Goniophotometer Test results

6.1 Test Data

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

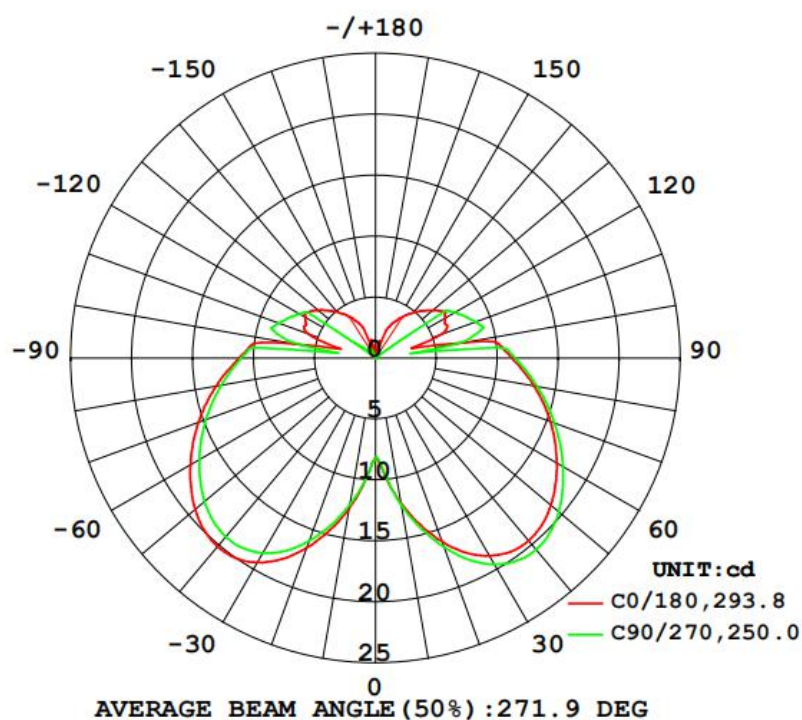
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
120.0	60.0	0.0380	0.9139	4.170

Optical Measurement

Luminous Flux (lm)	Efficacy(lm/W)	I _{max} (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
132.028	31.66	20.53	2.52	2.48

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	12.05	12.11	12.23	12.42	12.50	12.46	12.22	12.03	0- 10	1.024	1.024	0.78,0.78
20	16.00	16.30	16.52	16.59	16.55	16.32	15.96	15.83	10- 20	4.121	5.145	3.9,3.9
30	18.73	19.20	19.54	19.54	19.35	18.87	18.47	18.40	20- 30	8.271	13.42	10.2,10.2
40	19.55	20.11	20.50	20.49	20.18	19.55	19.14	19.13	30- 40	12.31	25.73	19.5,19.5
50	18.78	19.29	19.63	19.62	19.31	18.68	18.31	18.33	40- 50	15.11	40.84	30.9,30.9
60	17.17	17.57	17.77	17.75	17.53	17.01	16.69	16.70	50- 60	16.30	57.14	43.3,43.3
70	15.27	15.52	15.64	15.59	15.46	15.04	14.81	14.79	60- 70	16.17	73.31	55.5,55.5
80	13.21	13.39	13.48	13.43	13.28	12.99	12.84	12.83	70- 80	15.06	88.37	66.9,66.9
90	11.23	11.36	11.49	11.44	11.20	11.07	11.03	10.99	80- 90	13.29	101.7	77,77
100	7.503	4.211	6.485	3.686	6.804	3.790	5.981	4.513	90-100	9.944	111.6	84.5,84.5
110	5.765	7.522	8.741	7.742	5.881	7.452	8.438	7.060	100-110	6.726	118.3	89.6,89.6
120	6.623	6.560	7.522	6.884	6.665	6.963	7.259	6.883	110-120	6.441	124.8	94.5,94.5
130	6.103	3.349	0.1184	3.602	6.138	3.939	1.444	3.780	120-130	4.254	129.0	97.7,97.7
140	4.884	1.497	0.0928	1.667	4.962	1.778	0.0432	1.779	130-140	1.764	130.8	99.1,99.1
150	3.633	0.4087	0.1090	0.5288	3.740	0.4235	1.110	0.7169	140-150	0.7612	131.6	99.6,99.6
160	1.421	0.1466	0.0316	0.1220	0.8416	0.0381	0.2010	0.0906	150-160	0.3721	131.9	99.9,99.9
170	0.9345	0.2816	0.0233	0.1573	0.8746	0.0319	0.0404	0.1109	160-170	0.0789	132.0	100,100
180	0.0238	0.0264	0.0259	0.0259	0.0229	0.0246	0.0255	0.0264	170-180	0.0181	132.0	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		

**6.4 Luminous Distribution Intensity (cd) Data**

Gamma/C	0°	22.5°	45°	67.5°	90°	112.5°	135°	157.5°
0.0°	8.18	8.18	8.18	8.18	8.18	8.18	8.18	8.18
5.0°	9.78	9.72	9.69	9.68	9.73	9.79	9.93	10.1
10.0°	12.0	12.1	12.1	12.2	12.2	12.3	12.4	12.5
15.0°	14.1	14.2	14.3	14.4	14.5	14.5	14.6	14.7
20.0°	16.0	16.1	16.3	16.4	16.5	16.5	16.6	16.7
25.0°	17.6	17.7	18.0	18.2	18.3	18.2	18.3	18.3
30.0°	18.7	18.9	19.2	19.4	19.5	19.5	19.5	19.5
35.0°	19.4	19.6	19.9	20.1	20.3	20.3	20.3	20.3
40.0°	19.6	19.8	20.1	20.4	20.5	20.5	20.5	20.4
45.0°	19.3	19.5	19.9	20.1	20.2	20.3	20.2	20.2
50.0°	18.8	19.0	19.3	19.5	19.6	19.7	19.6	19.6
55.0°	18.0	18.3	18.5	18.6	18.8	18.8	18.8	18.7
60.0°	17.2	17.4	17.6	17.7	17.8	17.8	17.7	17.7
65.0°	16.2	16.5	16.6	16.6	16.7	16.7	16.7	16.7
70.0°	15.3	15.5	15.5	15.6	15.6	15.6	15.6	15.6
75.0°	14.2	14.5	14.5	14.5	14.6	14.6	14.5	14.5
80.0°	13.2	13.4	13.4	13.4	13.5	13.5	13.4	13.5
85.0°	12.2	12.4	12.3	12.4	12.4	12.4	12.4	12.4
90.0°	11.2	11.4	11.4	11.4	11.5	11.5	11.4	11.4
95.0°	10.4	10.5	10.5	8.80	10.0	8.90	10.6	10.5
100.0°	7.50	7.14	4.21	7.19	6.49	7.36	3.69	6.20
105.0°	3.17	3.19	6.54	9.26	8.96	9.37	7.03	4.16
110.0°	5.76	3.71	7.52	8.63	8.74	8.74	7.74	4.85
115.0°	6.48	2.37	7.87	8.02	8.12	8.12	8.01	3.22
120.0°	6.62	2.00	6.56	7.42	7.52	7.51	6.88	2.74
125.0°	6.70	1.35	4.74	6.66	4.19	6.75	5.07	1.76
130.0°	6.10	0.73	3.35	5.17	0.12	5.29	3.60	1.08
135.0°	5.49	0.38	2.30	3.48	0.16	2.12	2.51	0.61
140.0°	4.88	0.38	1.50	0.31	0.09	0.06	1.67	0.40
145.0°	4.27	0.56	0.90	0.82	0.12	1.72	1.03	0.47
150.0°	3.63	0.71	0.41	1.03	0.11	1.08	0.53	0.62
155.0°	3.00	0.82	0.06	0.51	0.07	0.56	0.03	0.74
160.0°	1.42	0.10	0.15	0.07	0.03	0.11	0.12	0.02
165.0°	1.25	0.84	0.22	0.04	0.02	0.03	0.19	0.73
170.0°	0.93	0.70	0.28	0.08	0.02	0.03	0.16	0.41
175.0°	0.38	0.38	0.23	0.12	0.03	0.03	0.09	0.18
180.0°	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.02



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Gamma/C	180°	202.5°	225°	247.5°	270°	292.5°	315°	337.5°
0.0°	8.18	8.18	8.18	8.18	8.18	8.18	8.18	8.18
5.0°	10.1	10.2	10.2	10.2	10.1	10.0	9.91	9.83
10.0°	12.5	12.5	12.5	12.3	12.2	12.1	12.0	12.0
15.0°	14.6	14.6	14.5	14.3	14.2	14.1	14.0	14.0
20.0°	16.6	16.5	16.3	16.1	16.0	15.9	15.8	15.9
25.0°	18.2	18.0	17.8	17.6	17.4	17.3	17.3	17.5
30.0°	19.3	19.1	18.9	18.6	18.5	18.4	18.4	18.6
35.0°	20.0	19.7	19.4	19.2	19.0	19.0	19.0	19.2
40.0°	20.2	19.9	19.6	19.3	19.1	19.1	19.1	19.3
45.0°	19.9	19.6	19.3	19.0	18.9	18.8	18.9	19.1
50.0°	19.3	19.0	18.7	18.4	18.3	18.3	18.3	18.6
55.0°	18.5	18.2	17.9	17.7	17.6	17.5	17.6	17.9
60.0°	17.5	17.3	17.0	16.8	16.7	16.6	16.7	17.0
65.0°	16.5	16.4	16.0	15.9	15.8	15.7	15.8	16.1
70.0°	15.5	15.4	15.0	14.9	14.8	14.7	14.8	15.2
75.0°	14.4	14.3	14.0	13.9	13.8	13.7	13.8	14.2
80.0°	13.3	13.2	13.0	12.9	12.8	12.8	12.8	13.2
85.0°	12.2	12.1	12.0	12.0	11.9	11.8	11.9	12.1
90.0°	11.2	11.1	11.1	11.1	11.0	10.9	11.0	11.2
95.0°	10.4	10.3	10.3	9.15	10.1	9.35	10.2	10.4
100.0°	6.80	6.37	3.79	6.99	5.98	6.54	4.51	7.52
105.0°	2.92	3.89	6.64	9.05	8.64	8.96	6.14	3.03
110.0°	5.88	5.16	7.45	8.45	8.44	8.37	7.06	4.57
115.0°	6.35	3.53	7.80	7.85	7.84	7.78	7.74	2.92
120.0°	6.67	2.95	6.96	7.20	7.26	7.19	6.88	2.33
125.0°	6.63	1.91	5.51	6.43	3.98	6.58	5.35	1.68
130.0°	6.14	1.17	3.94	5.35	1.44	5.66	3.78	0.97
135.0°	5.55	0.68	2.73	2.26	0.52	3.96	2.64	0.52
140.0°	4.96	0.51	1.78	0.09	0.04	0.21	1.78	0.41
145.0°	4.36	0.78	1.01	0.70	0.23	1.89	1.18	0.41
150.0°	3.74	1.25	0.42	0.85	1.11	1.27	0.72	0.41
155.0°	3.10	1.79	0.03	0.49	0.54	0.70	0.05	0.36
160.0°	0.84	0.55	0.04	0.08	0.20	0.22	0.09	0.03
165.0°	1.49	1.45	0.04	0.04	0.03	0.03	0.03	0.03
170.0°	0.87	0.84	0.03	0.11	0.04	0.03	0.11	0.03
175.0°	0.27	0.26	0.03	0.03	0.06	0.05	0.04	0.03
180.0°	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03



Guangdong Meide Testing Technology Co., Ltd.

NVLAP
TESTING
NVLAP LAB CODE:600177-0



7. Photo of sample

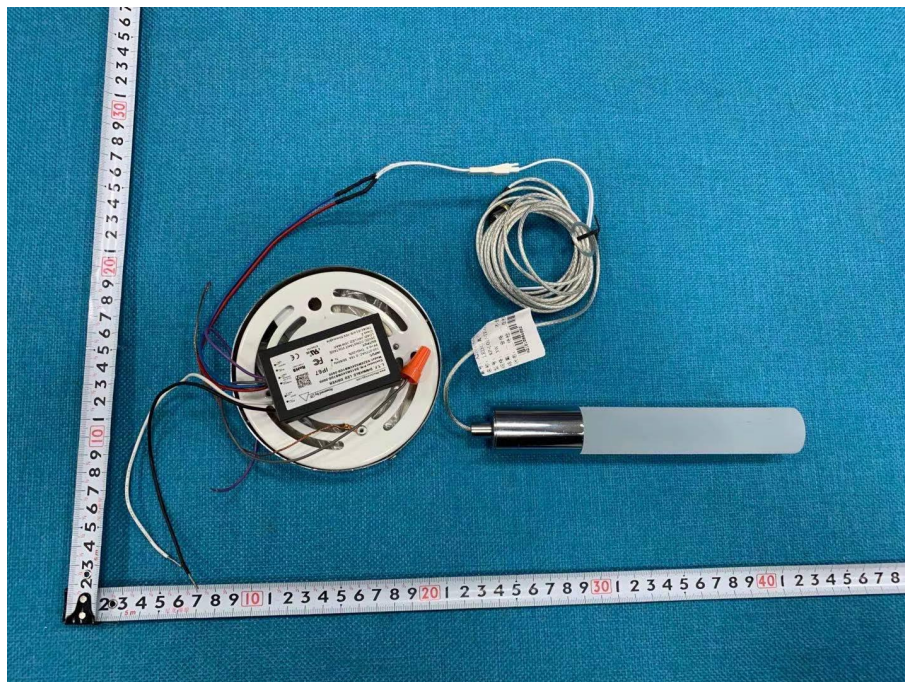


Figure 1

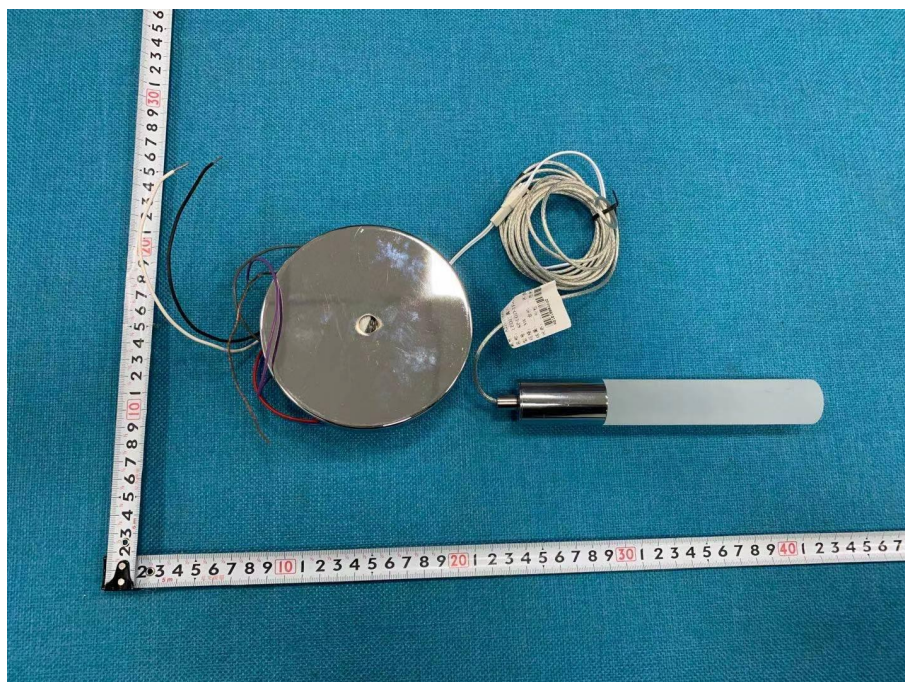


Figure 2

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