



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..... : NAN-48V-PC-12T-30K

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..... : C02A210702181L01003

Test Date..... : JUL. 15, 2021 – JUL. 21, 2021

Report Date..... : JUL. 22, 2021

Tested by:

Tim Qian

Tim Qian/ Test Engineer

Checked by:

Luke Lei

Luke Lei/ 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.

Report No.: C02A210702181L01003

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Laboratory: Guangdong Meide Testing Technology Co., Ltd.

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

Tel: 86-769-8507 5888 Fax: 86-769-8507 5898 E-mail: meidetest@meidetest.com

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



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1. Product Description for Equipment under Test(EUT)

The client submitted 1 sample of model NAN-48V-PC-12T-30K . The sample was received on 2021-07-15 ,is undamaged condition.

Model Tested:	NAN-48V-PC-12T-30K
Manufacturer:	Blackjack Lighting LLC
Manufacturer address:	1547 Barclay Blvd Buffalo Grove, IL 60089
Product Type:	Nano 48" Vanity
Rated Voltage/Frequency:	120V
Rated Power:	40W
Rated luminous flux:	2900LM
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	2022/05/18

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)
120.09	60.07	0.3294	39.14	0.9894	2932.2	74.91

CCT (K)	Ra	R9	x	y	u'	v'
3027	95.1	61	0.4323	0.3977	0.2503	0.5182

5.2 Color Rendering Index

Ra 95.1				
R1 98	R2 99	R3 98	R4 98	R5 98
R6 96	R7 92	R8 83	R9 61	R10 96
R11 95	R12 82	R13 99	R14 98	R15 92



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

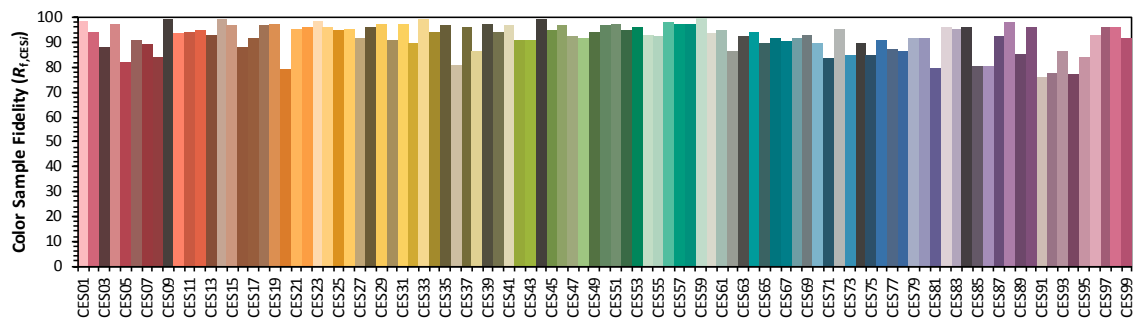
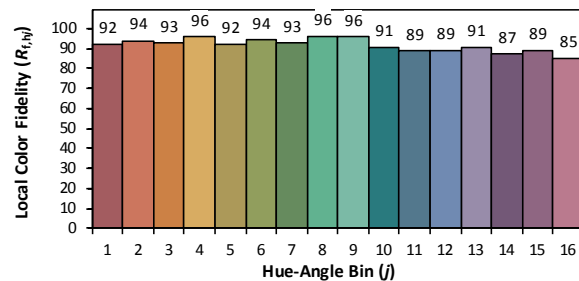
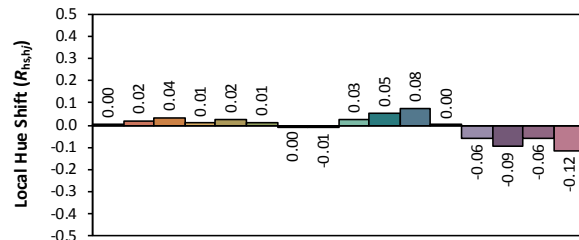
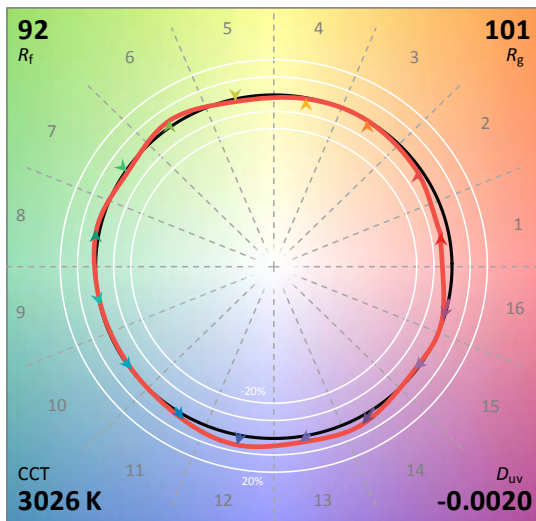
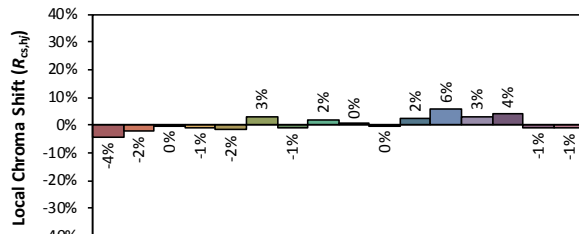
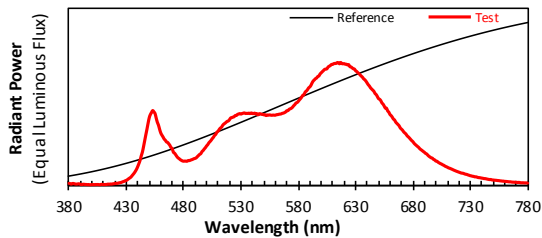
ANSI/IES TM-30-18 Color Rendition Report

Source: N/A

Date: 2021/7/21

Manufacturer: Blackjack Lighting LLC

Model: NAN-48V-PC-12T-30K



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

x 0.4323
 y 0.3976
 u' 0.2504
 v' 0.5181

CIE 13.3-1995
(CRI)

R_a 95
 R_g 61

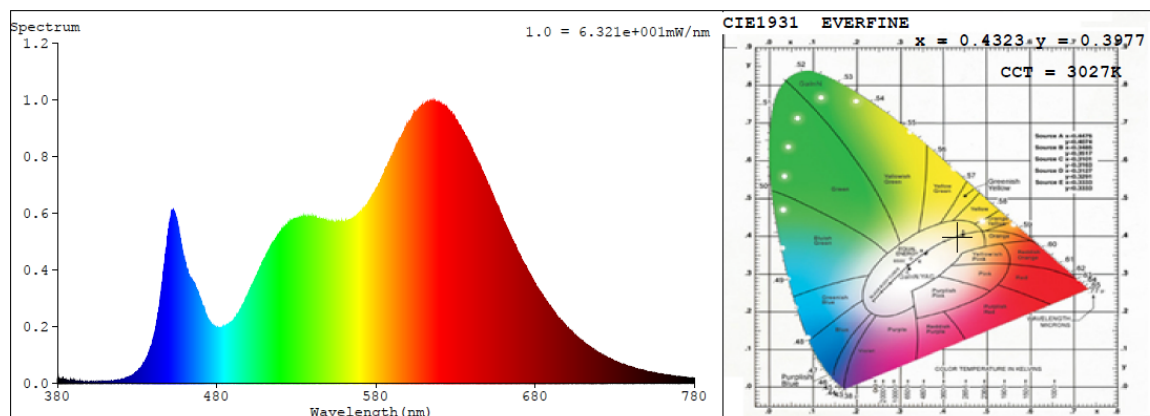
Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



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5.4 Relative Spectral Power Distribution



nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
380	0.0155	414	0.0092	448	0.4561	482	0.1955	516	0.5028
381	0.0129	415	0.0082	449	0.5051	483	0.1951	517	0.5107
382	0.0089	416	0.0098	450	0.5493	484	0.2007	518	0.5184
383	0.0142	417	0.0094	451	0.5745	485	0.2001	519	0.5217
384	0.014	418	0.011	452	0.5908	486	0.204	520	0.5324
385	0.0113	419	0.0125	453	0.6062	487	0.2073	521	0.5459
386	0.0095	420	0.014	454	0.5948	488	0.2109	522	0.5488
387	0.0097	421	0.0159	455	0.5826	489	0.2156	523	0.5529
388	0.0116	422	0.0157	456	0.5465	490	0.2182	524	0.5559
389	0.0114	423	0.018	457	0.5118	491	0.2232	525	0.5659
390	0.0068	424	0.0203	458	0.4883	492	0.2328	526	0.5661
391	0.0054	425	0.0216	459	0.4545	493	0.242	527	0.5747
392	0.0079	426	0.0249	460	0.4248	494	0.2509	528	0.578
393	0.008	427	0.0288	461	0.4069	495	0.2569	529	0.5813
394	0.0065	428	0.0316	462	0.3919	496	0.2732	530	0.5775
395	0.0063	429	0.0364	463	0.3748	497	0.282	531	0.5817
396	0.0051	430	0.04	464	0.3653	498	0.2948	532	0.5846
397	0.0058	431	0.0459	465	0.3515	499	0.3053	533	0.5868
398	0.0041	432	0.0532	466	0.3476	500	0.3192	534	0.5822
399	0.0046	433	0.0595	467	0.3358	501	0.3294	535	0.5835
400	0.005	434	0.0666	468	0.3234	502	0.3444	536	0.5826
401	0.0055	435	0.0779	469	0.3051	503	0.3545	537	0.5849
402	0.005	436	0.0891	470	0.2972	504	0.3655	538	0.5812
403	0.0059	437	0.101	471	0.2681	505	0.3788	539	0.5868
404	0.0058	438	0.1157	472	0.2609	506	0.3899	540	0.5824
405	0.0061	439	0.1323	473	0.2482	507	0.4049	541	0.5818
406	0.0053	440	0.1536	474	0.2341	508	0.4131	542	0.5853
407	0.0043	441	0.1774	475	0.223	509	0.4306	543	0.5782
408	0.0071	442	0.2035	476	0.2163	510	0.4379	544	0.5807
409	0.0072	443	0.2391	477	0.2081	511	0.4523	545	0.5714
410	0.0054	444	0.2697	478	0.2023	512	0.4638	546	0.58
411	0.0058	445	0.314	479	0.1973	513	0.4705	547	0.5793
412	0.0063	446	0.3622	480	0.1953	514	0.4858	548	0.5754
413	0.0069	447	0.4101	481	0.1962	515	0.4961	549	0.575



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nm	mW	nm	mW	nm	mW	nm	mW	nm	mW
550	0.5714	599	0.9023	648	0.7354	697	0.2197	746	0.0478
551	0.5728	600	0.9121	649	0.7197	698	0.2099	747	0.0463
552	0.5653	601	0.9217	650	0.7031	699	0.2061	748	0.0466
553	0.5702	602	0.9305	651	0.6973	700	0.1962	749	0.0435
554	0.5685	603	0.9399	652	0.6862	701	0.195	750	0.0426
555	0.5708	604	0.9422	653	0.6677	702	0.1869	751	0.0414
556	0.5687	605	0.9447	654	0.6579	703	0.1813	752	0.0406
557	0.5678	606	0.959	655	0.642	704	0.1758	753	0.0397
558	0.5693	607	0.9655	656	0.6254	705	0.1719	754	0.0383
559	0.5685	608	0.9713	657	0.6248	706	0.1659	755	0.0377
560	0.5686	609	0.9799	658	0.6031	707	0.1618	756	0.036
561	0.5722	610	0.9805	659	0.593	708	0.1554	757	0.0351
562	0.5732	611	0.9864	660	0.5744	709	0.151	758	0.0337
563	0.5756	612	0.9882	661	0.5652	710	0.1468	759	0.0334
564	0.5774	613	0.9883	662	0.5527	711	0.1414	760	0.0315
565	0.5787	614	0.9951	663	0.5369	712	0.1383	761	0.0312
566	0.5834	615	0.9935	664	0.5299	713	0.1344	762	0.0302
567	0.5852	616	0.9853	665	0.5127	714	0.1304	763	0.0292
568	0.5896	617	0.9961	666	0.5024	715	0.126	764	0.0278
569	0.5949	618	0.9871	667	0.4926	716	0.1216	765	0.0281
570	0.605	619	0.9855	668	0.4823	717	0.1178	766	0.0263
571	0.6051	620	0.9866	669	0.465	718	0.1138	767	0.0253
572	0.616	621	0.9817	670	0.4557	719	0.1104	768	0.025
573	0.6202	622	0.9819	671	0.4462	720	0.1068	769	0.0242
574	0.6251	623	0.9761	672	0.4327	721	0.1036	770	0.0242
575	0.6334	624	0.9786	673	0.4239	722	0.0998	771	0.0228
576	0.6452	625	0.9622	674	0.4148	723	0.0981	772	0.0232
577	0.6544	626	0.96	675	0.4011	724	0.0965	773	0.0228
578	0.6669	627	0.9526	676	0.3928	725	0.0927	774	0.0204
579	0.6714	628	0.945	677	0.3832	726	0.0896	775	0.02
580	0.6807	629	0.943	678	0.3723	727	0.088	776	0.0203
581	0.6929	630	0.9293	679	0.3621	728	0.0842	777	0.0195
582	0.7032	631	0.9227	680	0.3537	729	0.0812	778	0.0191
583	0.7157	632	0.913	681	0.341	730	0.0777	779	0.0192
584	0.7304	633	0.9054	682	0.3315	731	0.076	780	0.0175
585	0.7354	634	0.8948	683	0.3233	732	0.073		
586	0.7555	635	0.8853	684	0.315	733	0.072		
587	0.7639	636	0.8765	685	0.3075	734	0.0684		
588	0.7747	637	0.8637	686	0.2966	735	0.0685		
589	0.7895	638	0.8561	687	0.289	736	0.0657		
590	0.7974	639	0.845	688	0.2823	737	0.0627		
591	0.8098	640	0.8308	689	0.2745	738	0.0618		
592	0.8294	641	0.8162	690	0.2679	739	0.0603		
593	0.8453	642	0.8056	691	0.259	740	0.0581		
594	0.8547	643	0.791	692	0.2541	741	0.0568		
595	0.8646	644	0.781	693	0.2443	742	0.0543		
596	0.8704	645	0.7715	694	0.2355	743	0.0539		
597	0.8821	646	0.7616	695	0.2289	744	0.052		
598	0.8867	647	0.7442	696	0.2226	745	0.0497		



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6. Goniophotometer Test results

6.1 Test Data

Test Ambient Temperature	25.0℃	Test orientation	Downward
Operate time(Min.)	90	stabilization time(Min.)	60

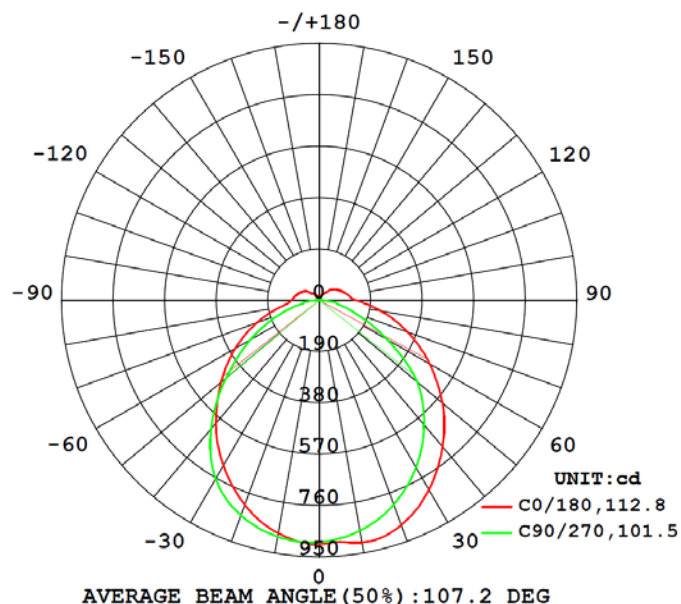
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
120.0	60.01	0.3243	0.9899	38.52

Optical Measurement

Luminous Flux (lm)	Efficacy(lm/W)	I _{max} (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
2923.9	75.91	911.4	1.17	1.26

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	Φ lum, lamp
10	910.0	882.5	866.1	860.7	876.0	883.7	888.7	890.1	0- 10	84.70	84.70	2.9,2.9
20	885.2	855.8	804.3	794.1	806.0	830.1	847.1	878.2	10- 20	243.6	328.3	11.2,11.2
30	809.1	781.9	714.5	700.7	707.2	744.9	764.0	813.8	20- 30	368.3	696.6	23.8,23.8
40	707.9	681.1	602.3	592.2	593.6	638.9	621.0	718.1	30- 40	440.7	1137	38.9,38.9
50	593.0	565.7	471.9	474.1	474.4	519.0	451.0	603.0	40- 50	454.4	1592	54.4,54.4
60	470.0	441.9	288.2	350.9	358.1	390.6	294.2	476.3	50- 60	412.9	2005	68.6,68.6
70	347.8	313.7	140.2	230.4	245.7	263.9	156.5	340.3	60- 70	328.0	2333	79.8,79.8
80	230.1	191.4	65.45	121.9	145.2	144.1	61.16	209.6	70- 80	218.9	2551	87.3,87.3
90	135.3	98.69	2.128	76.66	103.9	83.77	1.822	105.2	80- 90	118.3	2670	91.3,91.3
100	109.2	79.90	1.529	65.59	91.22	71.88	1.366	83.59	90-100	76.82	2747	93.9,93.9
110	93.54	67.32	1.239	54.85	79.17	60.31	1.113	69.51	100-110	62.68	2809	96.1,96.1
120	78.74	55.25	1.014	34.96	66.76	41.35	0.8173	56.17	110-120	47.77	2857	97.7,97.7
130	63.82	34.62	1.154	26.06	41.71	28.76	0.8125	34.05	120-130	32.61	2890	98.8,98.8
140	37.79	25.07	1.067	17.60	31.05	20.40	1.008	23.64	130-140	19.02	2909	99.5,99.5
150	25.36	15.84	0.8630	9.792	20.21	13.56	1.182	12.53	140-150	9.971	2919	99.8,99.8
160	13.22	6.172	0.9266	3.188	9.527	6.927	1.536	2.136	150-160	4.126	2923	100,100
170	2.974	2.065	1.186	1.446	2.053	1.900	1.525	1.707	160-170	0.9666	2924	100,100
180	1.381	1.371	1.357	1.422	1.376	1.465	1.349	1.365	170-180	0.1534	2924	100,100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



6.4 Luminous Distribution Intensity (cd) 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	903	901	899	897	895	893	892	891	903	901	899	897	895	893	892	891			
5	897	892	887	885	885	884	882	881	897	896	897	898	897	893	888	885			
10	910	900	883	866	866	864	861	860	876	879	884	888	889	882	890	897			
15	907	896	876	845	839	836	832	830	846	852	861	869	872	870	891	898			
20	885	874	856	821	804	800	794	790	806	815	830	842	847	854	878	879			
25	852	840	823	790	762	758	750	744	759	771	791	808	813	831	851	849			
30	809	798	782	751	714	710	701	693	707	721	745	766	764	799	814	809			
35	761	749	734	703	661	658	648	639	653	668	694	717	699	757	769	762			
40	708	697	681	650	602	602	592	583	594	612	639	663	621	707	718	710			
45	652	641	624	591	540	542	535	522	533	549	581	604	537	649	662	655			
50	593	583	566	530	472	481	474	464	474	490	519	542	451	588	603	598			
55	531	520	505	467	380	418	411	406	417	430	454	477	369	522	541	535			
60	470	459	442	401	288	353	351	349	358	371	391	409	294	453	476	473			
65	409	398	377	336	208	288	290	291	302	312	327	338	223	381	408	411			
70	348	337	314	269	140	220	230	235	246	254	264	265	156	309	340	348			
75	288	277	251	201	94.5	156	173	182	192	198	202	194	99.1	235	275	287			
80	230	219	191	138	65.4	97.9	122	135	145	148	144	127	61.2	162	210	228			
85	177	166	137	83.7	21.8	52.9	86.5	105	114	112	99.6	70.8	32.3	98.0	149	173			
90	135	127	98.7	49.9	2.13	39.9	76.7	95.8	104	100	83.8	46.9	1.82	54.6	105	130			
95	118	110	86.5	44.5	1.86	35.9	71.1	89.5	97.4	93.8	77.8	42.5	1.50	46.7	91.0	112			
100	109	102	79.9	40.7	1.53	32.0	65.6	83.6	91.2	87.6	71.9	38.2	1.37	41.9	83.6	104			
105	101	94.1	73.5	36.9	1.40	26.0	60.2	77.7	85.2	81.5	66.1	34.1	1.17	37.4	76.5	95.7			
110	93.5	86.8	67.3	33.2	1.24	19.8	54.8	71.9	79.2	75.4	60.3	24.3	1.11	32.6	69.5	88.1			
115	86.1	79.7	61.2	24.3	0.91	16.8	49.5	66.0	73.0	69.3	54.5	20.8	1.14	23.4	62.8	80.7			
120	78.7	72.7	55.3	21.4	1.01	13.9	35.0	60.0	66.8	63.0	41.3	17.6	0.82	19.9	56.2	73.4			
125	71.4	65.7	47.3	18.6	1.14	11.4	30.5	48.2	59.8	51.9	33.4	14.7	0.79	16.7	47.5	66.1			
130	63.8	58.6	34.6	15.8	1.15	9.02	26.1	37.1	41.7	38.7	28.8	11.9	0.81	13.7	34.1	58.8			
135	52.7	43.3	29.8	13.3	1.02	6.76	21.8	32.0	36.4	33.7	24.4	9.42	0.94	10.8	28.8	43.3			
140	37.8	34.6	25.1	10.6	1.07	4.56	17.6	26.8	31.0	28.7	20.4	7.33	1.01	7.64	23.6	34.1			
145	31.6	28.8	20.4	7.83	1.03	2.91	13.6	21.7	25.6	23.8	16.9	5.79	1.15	3.57	18.1	27.9			
150	25.4	23.1	15.8	4.86	0.86	1.95	9.79	16.7	20.2	19.1	13.6	4.72	1.18	2.12	12.5	21.4			
155	19.2	17.4	11.5	2.76	0.88	1.39	6.12	11.9	14.8	14.3	10.4	3.86	1.31	1.42	6.74	15.0			
160	13.2	11.9	6.17	1.87	0.93	1.28	3.19	7.20	9.53	9.39	6.93	2.85	1.54	1.39	2.14	8.59			
165	7.21	5.79	3.11	1.69	1.01	1.25	1.62	3.35	4.61	4.63	3.55	1.93	1.59	1.38	1.77	2.60			
170	2.97	2.39	2.07	1.33	1.19	1.23	1.45	1.63	2.05	2.07	1.90	1.76	1.52	1.47	1.71	2.02			
175	1.68	1.62	1.44	1.33	1.29	1.30	1.42	1.63	1.65	1.66	1.68	1.54	1.44	1.43	1.53	1.67			
180	1.38	1.44	1.37	1.34	1.36	1.37	1.42	1.54	1.38	1.38	1.46	1.38	1.35	1.35	1.36	1.42			



Guangdong Meide Testing Technology Co., Ltd.



7. Photo of sample



Figure 1

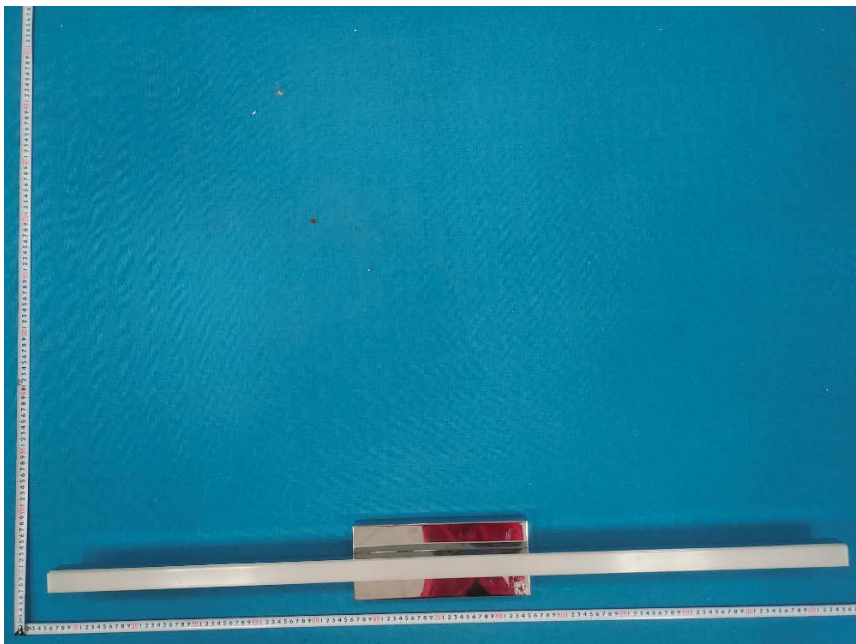


Figure 2

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