



## Test Report Of ANSI/IES LM-79-19

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

Report Number..... : N02A22100367L00101

Client..... : HK Lighting Group

Address..... : 2151 Anchor Ct, Thousand Oaks, CA, USA

Test Model..... : ZXL20i-W

Brand Name..... : HK Lighting Group

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..... : Oct. 21, 2022

Date of test ..... : Nov. 25, 2022

Date of report..... : Nov. 28, 2022

Tested by:

*Jarvis Zhang*

Jarvis Zhang/ Test Engineer

Checked by:

*Sandy Chen*

Sandy Chen/ 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:	ZXL20i-W
Manufacturer:	HK Lighting Group
Product Type:	AREA ACCENT LIGHT
Rated Voltage/Frequency:	120V AC, 60Hz
Rated Power:	28W
Rated luminous flux:	2200lm
Nominal CCT:	3000K
LED Manufacturer:	NICHIA
LED Model No.:	NICHIA 108b

## 2. Standards Used

- ANSI/IES LM-79-19:APPROVED METHOD:OPTICAL AND ELECTRICAL MEASUREMENTS OF SOLID-STATE LIGHTING PRODUCTS

## 3. Test equipment list

Test Equipment	Serial No.	Model No.	Calibration due date
Full-field Speed Goniophotometer	MD-E028	GO-R5000	2023/09/17
Digital Power Meter	MD-E001	PF2010	2023/09/17
AC Testing Power Source	MD-E002	DPS1060	2023/09/17
Total Spectral Radiant Flux Standard Lamp	MD-E007	D908S	2023/10/13

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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  horizontal intervals. Photometric distance was more than five times of the Largest dimension of the test SSL product.

## 5. Goniophotometer Test results

### 5.1 Test Data

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

### Electrical Measurement

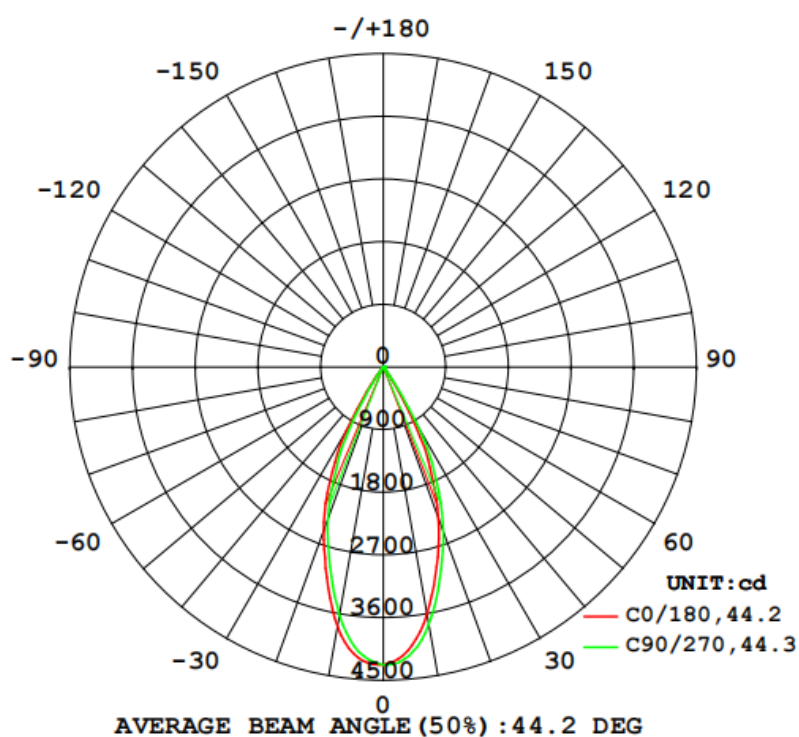
Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
120.2	60	0.9234	0.9962	27.22

### Optical Measurement

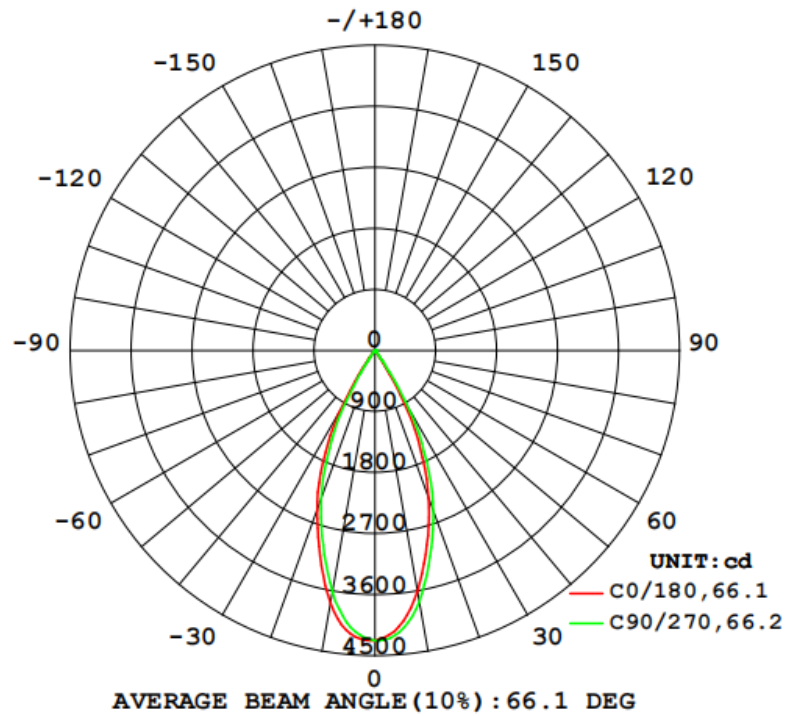
Luminous Flux (lm)	Efficacy(lm/W)	I <sub>max</sub> (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
2220.2	81.56	4285	0.72	0.68

## 5.2 Luminous Intensity Distribution

### 5.2.1 Beam Angle (50%) Mode:



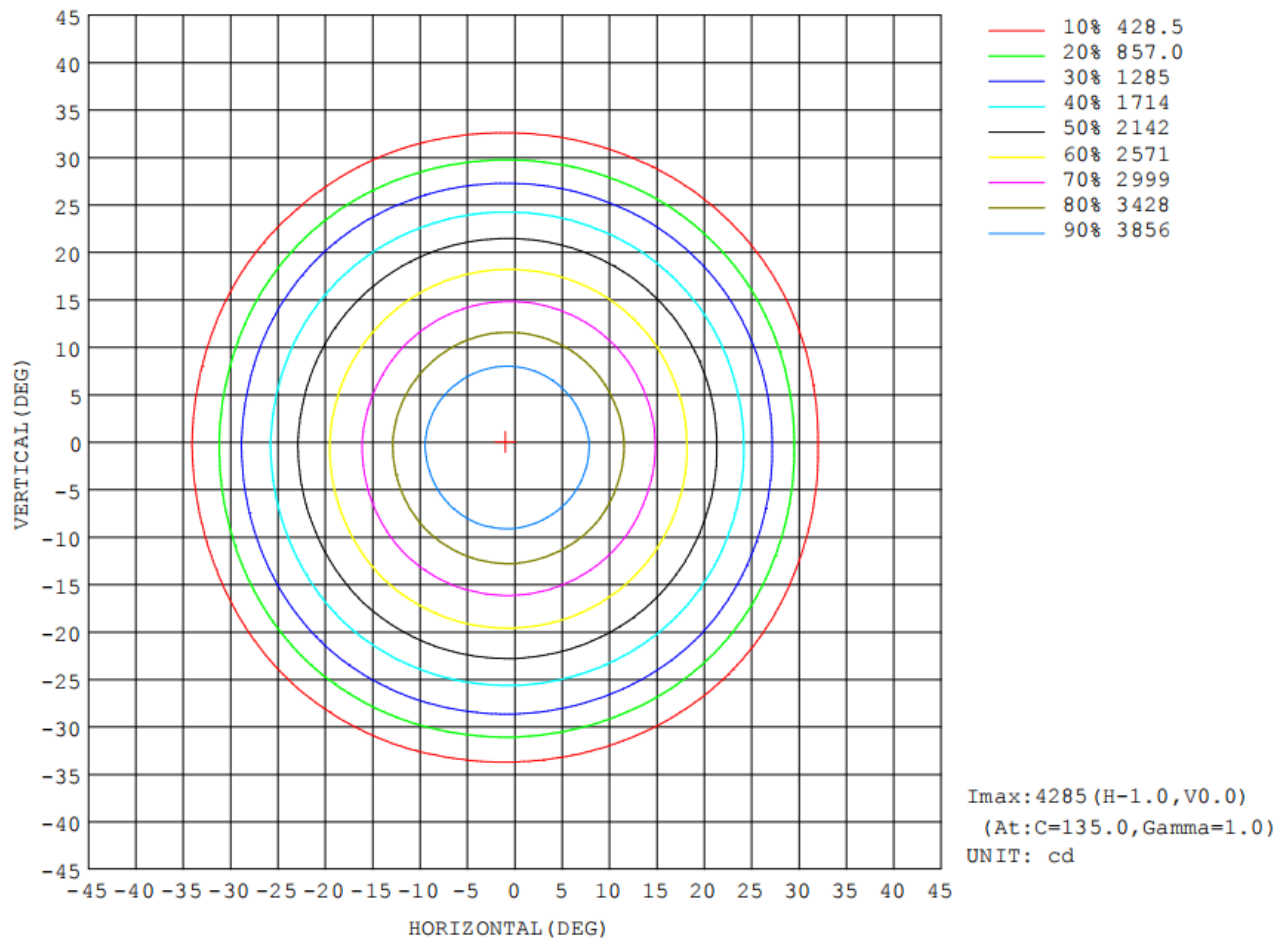
### 5.2.2 Beam Angle (10%) Mode:



### 5.3 Zonal Flux Diagram

γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	lum, lamp
10	3611	3674	3763	3816	3791	3698	3625	3592	0- 10	380.8	380.8	17.2, 17.2
20	2323	2417	2521	2562	2510	2412	2342	2313	10- 20	847.9	1229	55.3, 55.3
30	762.1	905.7	1052	1115	1077	933.3	806.8	741.3	20- 30	768.9	1998	90, 90
40	37.92	44.01	75.72	89.16	61.29	47.70	38.79	36.84	30- 40	199.2	2197	99, 99
50	4.309	5.452	7.870	9.588	9.709	8.229	5.770	4.425	40- 50	16.11	2213	99.7, 99.7
60	1.622	1.537	1.680	1.647	1.756	1.736	1.764	1.535	50- 60	2.319	2215	99.8, 99.8
70	0.6490	0.5990	0.6473	0.6195	0.6570	0.6458	0.6965	0.5827	60- 70	1.274	2217	99.8, 99.8
80	0.2904	0.2789	0.2846	0.2677	0.3223	0.3224	0.3355	0.2894	70- 80	0.4732	2217	99.9, 99.9
90	0.0157	0.0145	0.0145	0.0132	0.0132	0.0128	0.0132	0.0128	80- 90	0.1582	2217	99.9, 99.9
100	0.0136	0.0132	0.0128	0.0111	0.0128	0.0128	0.0132	0.0132	90-100	0.0144	2217	99.9, 99.9
110	0.0128	0.0123	0.0119	0.0111	0.0132	0.0140	0.0136	0.0132	100-110	0.0134	2217	99.9, 99.9
120	0.0483	0.0412	0.0362	0.0319	0.0345	0.0397	0.0475	0.0506	110-120	0.0191	2217	99.9, 99.9
130	0.2689	0.2490	0.2248	0.2234	0.3078	0.3283	0.3440	0.3658	120-130	0.1223	2217	99.9, 99.9
140	0.7081	0.6336	0.5858	0.6327	1.161	1.129	1.016	1.197	130-140	0.4288	2218	99.9, 99.9
150	1.114	0.9764	0.8681	1.033	2.199	2.126	1.775	2.122	140-150	0.7625	2219	99.9, 99.9
160	1.533	1.348	1.233	1.442	2.840	2.827	2.424	2.582	150-160	0.8284	2219	100, 100
170	1.592	1.433	1.488	1.593	2.701	2.689	2.449	2.466	160-170	0.5843	2220	100, 100
180	2.007	1.937	1.994	2.047	2.046	1.955	1.958	2.017	170-180	0.1906	2220	100, 100
DEG	LUMINOUS INTENSITY: cd									UNIT: lm		

### 5.4 Isocandela Diagram



## 5.5 Luminous Distribution Intensity Data

Table--1

UNIT: cd

C (DEG) Y (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	4274	4274	4274	4274	4274	4274	4274	4274	4274	4274	4274	4274	4274	4274	4274	4274			
5	4086	4100	4119	4143	4167	4191	4203	4198	4190	4175	4146	4126	4102	4085	4075	4074			
10	3611	3634	3674	3720	3763	3797	3816	3811	3791	3750	3698	3661	3625	3602	3592	3592			
15	2973	2995	3047	3098	3144	3179	3194	3172	3136	3089	3040	3004	2972	2954	2955	2956			
20	2323	2364	2417	2474	2521	2552	2562	2540	2510	2461	2412	2379	2342	2322	2313	2319			
25	1593	1637	1693	1748	1811	1851	1866	1849	1831	1773	1702	1638	1591	1564	1559	1574			
30	762	823	906	975	1052	1096	1115	1098	1077	1013	933	862	807	760	741	751			
35	173	183	207	240	278	306	315	302	324	293	264	203	188	179	175	175			
40	37.9	40.4	44.0	65.3	75.7	78.3	89.2	79.9	61.3	54.3	47.7	42.3	38.8	37.4	36.8	37.4			
45	15.8	16.3	17.0	17.8	19.3	20.1	20.5	20.2	20.4	20.0	18.8	17.6	16.7	16.2	15.8	15.8			
50	4.31	4.70	5.45	6.48	7.87	9.04	9.59	9.57	9.71	9.27	8.23	6.90	5.77	4.95	4.42	4.40			
55	2.04	2.03	2.06	2.16	2.29	2.24	2.23	2.24	2.33	2.32	2.27	2.26	2.25	2.09	2.00	2.16			
60	1.62	1.53	1.54	1.60	1.68	1.64	1.65	1.70	1.76	1.76	1.74	1.75	1.76	1.61	1.54	1.79			
65	1.32	1.26	1.24	1.29	1.34	1.32	1.34	1.40	1.45	1.47	1.46	1.49	1.51	1.37	1.30	1.37			
70	0.65	0.60	0.60	0.62	0.65	0.63	0.62	0.64	0.66	0.66	0.65	0.68	0.70	0.60	0.58	0.62			
75	0.43	0.42	0.42	0.44	0.46	0.45	0.44	0.46	0.48	0.47	0.46	0.48	0.49	0.41	0.40	0.42			
80	0.29	0.28	0.28	0.28	0.28	0.26	0.27	0.30	0.32	0.33	0.32	0.34	0.34	0.29	0.29	0.29			
85	0.09	0.10	0.11	0.13	0.16	0.16	0.17	0.19	0.21	0.22	0.20	0.19	0.17	0.12	0.11	0.10			
90	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
95	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
100	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
105	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
110	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01			
115	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02			
120	0.05	0.05	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05	0.05	0.05			
125	0.13	0.13	0.12	0.11	0.11	0.10	0.10	0.10	0.12	0.12	0.13	0.14	0.15	0.15	0.15	0.15			
130	0.27	0.26	0.25	0.23	0.22	0.22	0.22	0.23	0.31	0.32	0.33	0.33	0.34	0.35	0.37	0.37			
135	0.46	0.45	0.42	0.41	0.39	0.39	0.40	0.41	0.66	0.67	0.68	0.66	0.66	0.68	0.72	0.75			
140	0.71	0.68	0.63	0.61	0.59	0.62	0.63	0.64	1.16	1.17	1.13	1.06	1.02	1.09	1.20	1.25			
145	0.95	0.92	0.84	0.74	0.77	0.81	0.87	0.87	1.72	1.69	1.67	1.51	1.41	1.51	1.72	1.80			
150	1.11	1.08	0.98	0.82	0.87	0.97	1.03	1.05	2.20	2.20	2.13	1.96	1.78	1.88	2.12	2.28			
155	1.36	1.31	1.16	1.05	1.04	1.20	1.26	1.30	2.62	2.61	2.57	2.39	2.14	2.07	2.42	2.63			
160	1.53	1.47	1.35	1.20	1.23	1.34	1.44	1.47	2.84	2.84	2.83	2.62	2.42	2.38	2.58	2.79			
165	1.60	1.56	1.46	1.34	1.38	1.51	1.58	1.55	2.85	2.86	2.81	2.65	2.48	2.41	2.51	2.72			
170	1.59	1.53	1.43	1.41	1.49	1.58	1.59	1.52	2.70	2.71	2.69	2.56	2.45	2.41	2.47	2.56			
175	1.69	1.68	1.59	1.59	1.64	1.71	1.70	1.66	2.37	2.38	2.37	2.27	2.26	2.26	2.29	2.28			
180	2.01	1.97	1.94	2.00	1.99	2.03	2.05	1.98	2.05	2.06	1.95	1.92	1.96	1.98	2.02	2.01			



## 6. Photo of sample

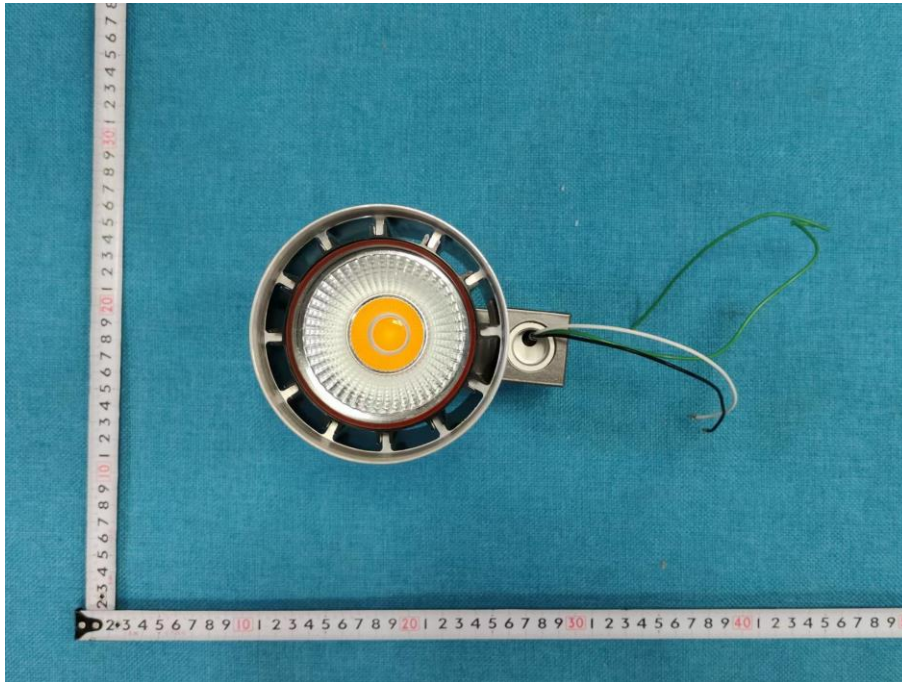


Figure 1 Overview



Figure 2 Overview

---End of Report---