



Guangdong Meide Testing Technology Co., Ltd.



TESTING
NVLAP LAB CODE:600177-0

TEST REPORT OF IES LM-79-08

Approved Method for Electrical and Photometric Measurements of Solid-State Lighting Products

Client..... : Blackjack Lighting LLC

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

Test Model..... : PSM-321-SN-27U-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..... : CA1910185L 01001

Test Date..... : Oct.28,2019

Report Date..... : Oct.30,2019

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.



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1. Product Information

Manufacturer.....: Blackjack Lighting LLC

Product Type.....: 32" PRISM SINGLE TIER CHANDELIER

Rated Voltage/Frequency.....: 120-277V AC 50/60Hz

Rated Power.....: 10W

Declared CCT.....: 3000K

LED Manufacturer.....: N/A

LED Model No.....: N/A

Receipt samples.....: 1 unit

Date of Receipt samples.....: Oct.28,2019

2. Standards Used

- IES LM-79-08:Approved Method:Electrical and Photometric Measurements of Solid-State Lighting Products

3. Test equipment list

Test Equipment	Serial No	Model No	Range Used	Calibration due date
Full-field Speed Goniophotometer	MD-E028	GO-R5000	1600mm,3000W/10A	2020/10/06
Digital Power Meter	MD-E001	PF2010	0-600V,0-20A,0-4KW	2020/10/06
AC Testing Power Source	MD-E002	DPS1060	0-300Vac,0-20A,0-5KW	2020/10/06
Total Spectral Radiant Flux Standard Lamp	MD-E007	D908S	7.295A,2856K,11227lm,94.35V	2020/10/06
Integrating Sphere System	MD-E029	2M	--	2020/10/06
High Accuracy Array Spectoradio Meter	MD-E011	HAAS-3000	380-780nm	2020/10/06
Digital Power Meter	MD-E008	PF310	0-600Vac,0-20A	2020/10/06
AC Testing Power Source	MD-E010	DPS1010	0-300Vac,0-10A,0-1000W	2020/10/06
Standard Lamp	MD-E012	D204	3.9424A,20.75V,2856K,1332.3lm	2020/02/20

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 IES LM-79-08. The product was operated at rated voltage or at voltage required by manufacturer. The ambient temperature of the sample was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ during measurement. And relative humidity is less than 65%.

Goniophotometer System

The sample was tested according to the IES LM-79-2008.

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 IES LM-79-2008.

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.



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5. Integrating Sphere Test Results

5.1 Test Data

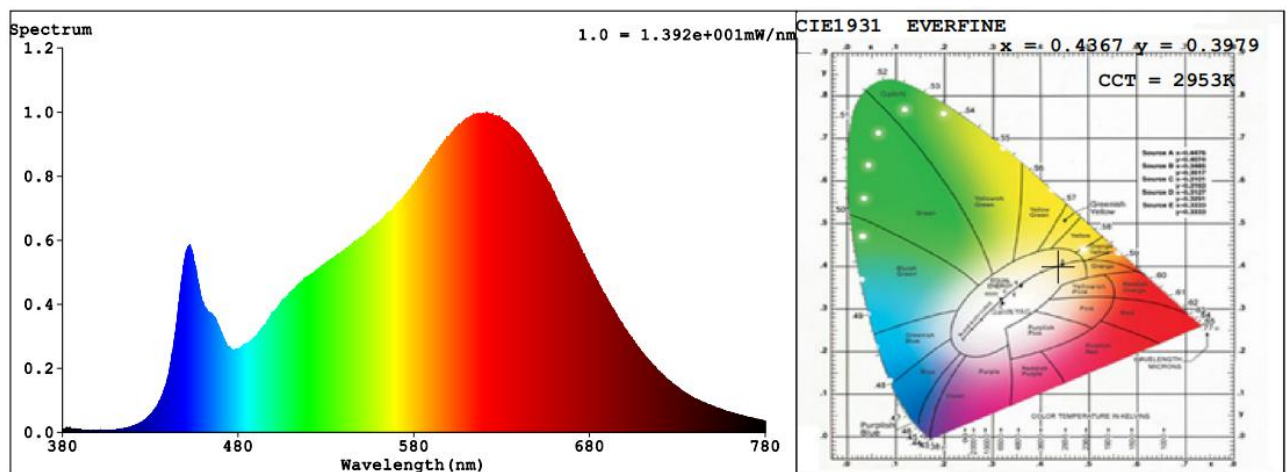
Test Ambient Temperature	25.1℃	Test orientation	Downward
Operate time(Min.)	60	stabilization time(Min.)	45

Photometric and Electrical Measurement Result

Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Luminous Flux(lm)	Efficacy (lm/W)
120.0	60	0.0804	9.16	0.9491	678.93	74.12

CCT (K)	Ra	R9	x	y	u'	v'
2953	93.9	64	0.4367	0.3979	0.2531	0.5189

5.2 Spectrum



Colorimetric Parameters

Chromaticity Coordinate: $x = 0.4367$ $y = 0.3979$ / $u' = 0.2531$ $v' = 0.5189$ ($duv = -2.87e-03$)

CCT= 2953K Prcp WL: $L_d = 583.9nm$ Purity=50.5%

Peak WL: $L_p = 621nm$ FWHM: $\approx 158.3nm$ Ratio: R=24.8% G=72.0% B=3.1%

Render Index: $R_a = 93.9$

R1 =95 R2 =99 R3 =98 R4 =94 R5 =95 R6 =96 R7 =91

R8 =83 R9 =64 R10=96 R11=95 R12=84 R13=97 R14=100 R15=91



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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

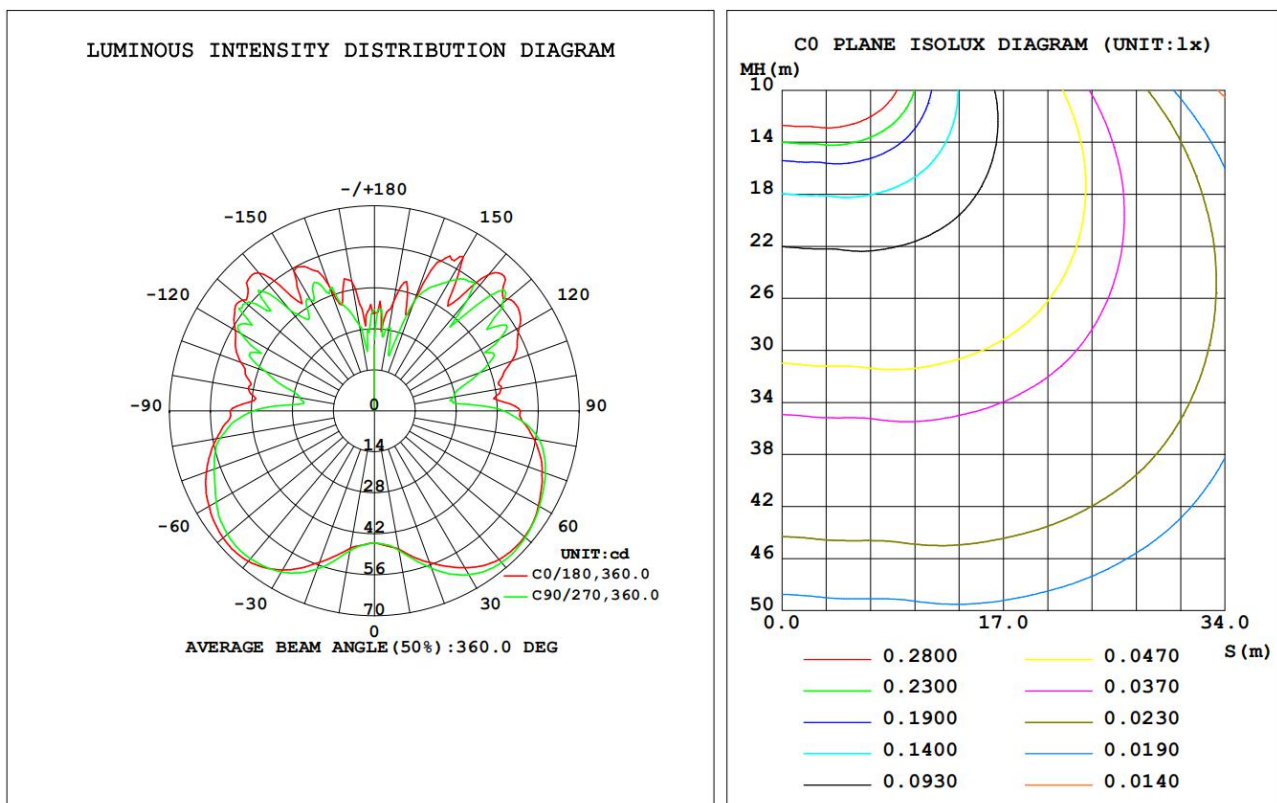
Electrical Measurement

Input Voltage (V)	Frequency (Hz)	Input Current(A)	Power Factor	Power(W)
120.0	60	0.0803	0.9489	9.14

Photometric Measurement

Luminous Flux (lm)	Efficacy(lm/W)	I _{max} (cd)	Spacing Criteria (C0/180°)	Spacing Criteria (C90/270°)
681.15	74.52	69.07	2.09	2.05

6.2 Luminous Intensity Distribution Diagram and C0 Plane Isolux Diagram (Unit : lx)





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6.3 Zonal Flux Diagram

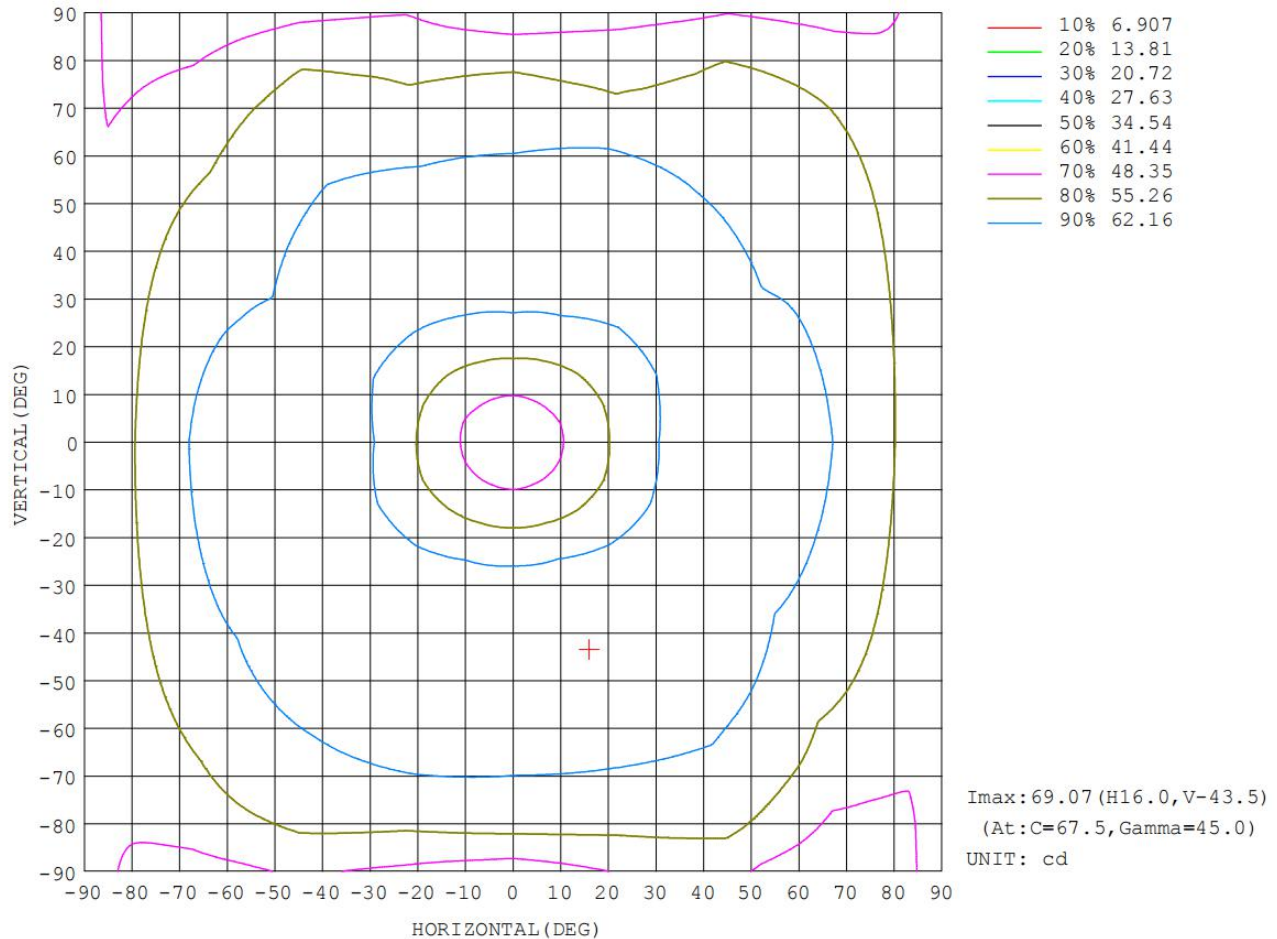
γ	C0	C45	C90	C135	C180	C225	C270	C315	γ	Φ zone	Φ total	%lum, lamp
10	47.98	48.27	48.38	48.15	47.64	48.17	48.57	48.40	0- 10	4.463	4.463	0.66, 0.66
20	55.11	55.59	57.18	55.76	55.01	55.61	57.48	55.54	10- 20	14.84	19.30	2.83, 2.83
30	61.79	62.55	64.59	62.49	62.72	61.82	63.50	61.24	20- 30	27.62	46.92	6.89, 6.89
40	66.24	66.40	67.60	66.33	67.04	64.88	65.87	64.13	30- 40	40.59	87.51	12.8, 12.8
50	66.95	67.11	67.28	66.96	67.50	64.97	65.55	64.18	40- 50	51.27	138.8	20.4, 20.4
60	64.70	65.70	65.12	65.16	65.25	62.99	62.39	62.52	50- 60	58.41	197.2	29, 29
70	60.95	62.31	62.14	61.93	61.05	59.48	58.26	59.16	60- 70	61.75	258.9	38, 38
80	55.40	58.81	57.25	57.96	54.76	55.94	53.43	56.40	70- 80	61.39	320.3	47, 47
90	49.90	49.75	44.29	49.08	49.36	47.09	41.45	48.16	80- 90	56.20	376.5	55.3, 55.3
100	43.94	41.12	27.51	41.12	43.81	39.95	25.87	41.49	90-100	43.93	420.5	61.7, 61.7
110	49.94	51.82	38.50	52.05	48.51	50.00	39.74	51.20	100-110	45.61	466.1	68.4, 68.4
120	57.17	58.13	49.47	57.00	54.90	55.77	52.58	56.72	110-120	52.58	518.7	76.1, 76.1
130	59.50	61.07	57.00	57.50	58.82	59.83	57.17	61.33	120-130	50.98	569.6	83.6, 83.6
140	60.85	52.89	49.76	54.64	61.50	56.61	44.67	58.34	130-140	42.42	612.1	89.9, 89.9
150	60.81	51.25	51.05	45.79	55.04	54.25	43.93	50.29	140-150	31.81	643.9	94.5, 94.5
160	39.73	37.90	39.94	43.01	45.41	37.79	44.56	51.96	150-160	22.64	666.5	97.9, 97.9
170	37.91	42.61	28.69	35.42	44.95	45.09	29.79	26.29	160-170	11.47	678.0	99.5, 99.5
180	33.36	28.42	24.42	33.44	33.80	24.68	34.71	34.58	170-180	3.163	681.2	100, 100
DEG	LUMINOUS INTENSITY:cd									UNIT:lm		



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6.4 Isocandela Diagram





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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	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1	45.1			
5	46.3	46.2	46.1	46.0	45.9	45.9	45.9	45.9	46.0	46.1	46.1	46.1	46.0	46.0	46.1	46.2			
10	48.0	48.1	48.3	48.4	48.4	48.4	48.2	47.9	47.6	47.7	48.2	48.4	48.6	48.7	48.4	48.1			
15	51.7	51.3	51.4	52.3	52.6	52.3	51.6	51.4	51.3	51.1	51.5	52.6	53.0	52.7	51.8	51.3			
20	55.1	54.8	55.6	56.8	57.2	56.8	55.8	54.9	55.0	55.0	55.6	56.9	57.5	56.8	55.5	55.0			
25	58.6	58.4	59.5	61.2	61.5	61.0	59.4	58.5	59.2	58.5	59.2	60.4	61.0	60.3	58.7	58.2			
30	61.8	61.4	62.6	64.7	64.6	64.5	62.5	61.6	62.7	61.3	61.8	62.9	63.5	63.1	61.2	60.9			
35	64.5	63.6	64.9	67.2	66.6	67.0	64.9	63.8	65.3	63.1	63.8	64.5	65.0	65.0	63.1	62.9			
40	66.2	64.9	66.4	68.6	67.6	68.3	66.3	65.1	67.0	64.0	64.9	65.3	65.9	66.0	64.1	63.9			
45	67.0	65.3	67.1	69.1	67.7	68.8	67.0	65.5	67.7	64.1	65.2	65.2	66.2	66.6	64.4	64.2			
50	67.0	65.0	67.1	68.8	67.3	68.7	67.0	65.3	67.5	63.6	65.0	64.6	65.6	66.4	64.2	64.0			
55	66.2	64.1	66.6	68.0	66.4	67.9	66.3	64.4	66.7	62.6	64.2	63.5	64.4	65.5	63.5	63.1			
60	64.7	62.7	65.7	66.8	65.1	66.7	65.2	63.3	65.3	61.2	63.0	62.1	62.4	63.8	62.5	61.9			
65	62.9	61.3	64.2	64.6	63.7	65.2	63.7	62.4	63.5	59.9	61.3	60.2	60.1	61.3	61.0	61.0			
70	61.0	59.5	62.3	62.1	62.1	62.9	61.9	61.4	61.1	58.4	59.5	58.2	58.3	58.0	59.2	59.4			
75	58.6	56.5	60.9	59.2	60.1	59.3	60.2	59.0	58.2	55.8	58.3	55.6	56.4	54.9	58.0	59.0			
80	55.4	53.1	58.8	56.9	57.2	56.7	58.0	55.6	54.8	52.7	55.9	53.7	53.4	52.0	56.4	56.6			
85	51.5	48.4	55.4	53.6	52.1	53.4	54.8	52.5	51.2	49.2	52.4	51.2	48.9	50.0	53.9	53.1			
90	49.9	43.2	49.8	48.8	44.3	47.3	49.1	46.1	49.4	43.0	47.1	47.9	41.5	44.8	48.2	46.0			
95	42.3	39.7	41.0	37.9	28.9	37.4	41.0	40.1	41.2	37.7	37.7	36.1	26.2	34.8	40.3	40.2			
100	43.9	42.6	41.1	39.3	27.5	38.4	41.1	42.2	43.8	39.9	39.9	38.6	25.9	35.5	41.5	41.6			
105	45.2	44.4	47.2	43.2	30.4	42.6	46.9	44.3	45.2	42.2	45.5	45.2	31.3	43.6	47.1	42.8			
110	49.9	50.0	51.8	53.6	38.5	52.1	52.1	47.9	48.5	46.9	50.0	51.6	39.7	52.3	51.2	47.6			
115	53.9	53.3	55.9	61.3	45.2	59.6	55.3	51.8	52.4	49.9	52.8	56.8	46.9	58.6	54.3	51.5			
120	57.2	57.0	58.1	55.0	49.5	56.3	57.0	56.1	54.9	51.7	55.8	52.8	52.6	56.5	56.7	55.8			
125	60.3	58.9	57.3	59.7	50.2	59.6	55.6	58.7	58.3	53.9	56.0	57.2	51.1	54.8	56.8	56.4			
130	59.5	57.6	61.1	67.7	57.0	65.1	57.5	57.1	58.8	55.4	59.8	51.7	57.2	50.7	61.3	56.5			
135	63.4	59.2	46.9	46.7	55.3	49.0	45.9	56.1	61.8	57.0	49.2	56.7	54.7	58.4	44.7	57.7			
140	60.9	52.9	52.9	47.3	49.8	49.2	54.6	49.4	61.5	53.3	56.6	52.4	44.7	44.3	58.3	52.0			
145	43.8	41.3	56.7	41.3	54.7	49.3	54.1	42.8	45.7	45.0	62.5	41.4	38.7	54.8	63.2	48.8			
150	60.8	61.0	51.3	53.3	51.1	59.2	45.8	54.2	55.0	54.7	54.2	40.4	43.9	59.4	50.3	57.2			
155	57.5	56.3	35.2	51.0	46.8	52.4	35.1	56.0	54.0	55.7	48.6	40.1	48.5	54.9	40.8	41.0			
160	39.7	37.3	37.9	47.3	39.9	44.8	43.0	42.3	45.4	46.9	37.8	53.4	44.6	42.5	52.0	39.3			
165	43.6	49.3	45.1	33.0	19.6	38.1	43.0	46.1	42.0	42.2	46.5	42.3	36.2	32.7	43.9	45.0			
170	37.9	42.9	42.6	32.1	28.7	32.8	35.4	45.1	44.9	45.0	45.1	35.0	29.8	25.6	26.3	42.2			
175	27.3	40.8	31.2	26.6	31.8	19.4	31.0	43.3	32.9	33.1	40.5	37.5	27.9	34.5	32.3	33.7			
180	33.4	24.1	28.4	36.5	24.4	40.9	33.4	29.7	33.8	33.5	24.7	34.6	34.7	27.6	34.6	34.6			



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7.Photo of sample

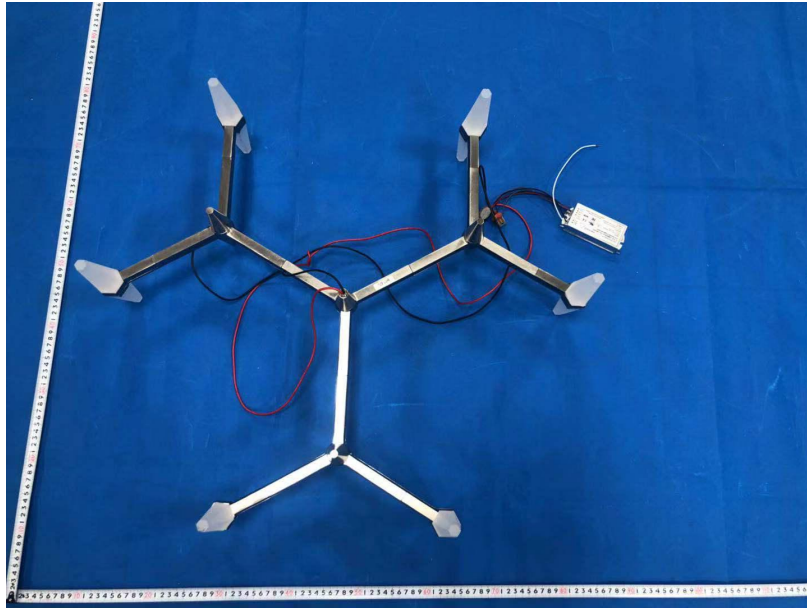


Figure 1

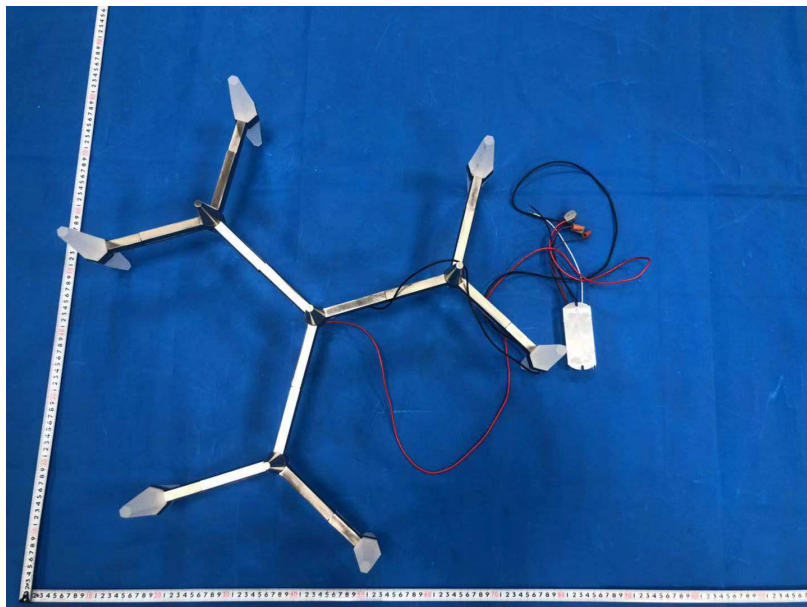


Figure 2



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32" PRISM SINGLE TIER

Figure 3

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