LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

Lamp specifics

Manufacturer:	LEDVANCE LLC	Watts:	14W
Lamp:	LED15A19F8SC310YV	Rated Lumens:	1500Lumens
Trademark:	LEDVANCE & SYLVANIA	Orientation:	VBU and VBD
Test Requester:	Huang Chengqi	Rated Voltage:	120V AC(tested @ 60Hz)
Telephone:	0592-7263029	Beam Angle:	N/A
Sample Size:	10	Center Beam:	N/A
Date of Received:	2025.01.22	CCT:	2700K/3000K/3500K/4000K/5000K
Date of Tests:	2025.01.25 ~ 2025.02.10	Current Burn Time:	0 hr

Test Purpose

Electrical and Photometric tests as required by IES LM-79 test standard

Standards used

ANSI/IES LM-79:2019 Optical and Electrical Measurements of Solid-State Lighting Products
IES LM-20:2013 Photometric testing of reflector type lamps
IES LM-58:2013 Spectroradiometric Measurement Methods for Light Sources
CIE Pub.13.3:1995 Method of measuring and Specifying Color Rendering Properties of Light Sources
CIE Pub.15:2004 Method of measuring and Specifying Color Rendering of Light Sources
ANSI C82.77:2002 Harmonic Emission Limits- Related Power Quality Requirements for Lighting Equipment

Disclaimers

1. It's not allowed if partly use this report without written authorization.
2. Test conclusion in this report is solely applicable for referring samples.
3. The test sample information in this report is provided by the customer.
4. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Measurements performed by one or more of the following authorized operators:

Xu guohua, He Chunfang,
Zhou Lei

Report prepared by: Zhou Lei

Report was checked and issued by
Chen Xiangbing
Authorized signatory

Issue Date：2025.02.14
E-mail: chenxb@topstar.com.cn
Phone: +86-592-7263892

Instrumentation

Goniometry Instrumentation

EVERFINE TYPE C High Speed Mirror Goniophotometer R5000
EVERFINE HAAS-2000 High Accuracy Array Spectroradiometer
EVERFINE ID-1000 Accurate Photometer
EVERFINE PF2010 Digital Power Analyzer
EVERFINE WY12010 DC Power source
NF EC1000S AC Power source
D980s total luminous flux and spectral flux standard lamp certified by NIM

Sphere Spectroradiometry Instrumentation

EVERFINE HAAS-2000 High Accuracy Array Spectroradiometer, FWHM = 2nm
Yokogawa WT1800 Digital power meter
EVERFINE PCR-1000W AC power source
EVERFINE WY305 DC Power source
EVERFINE 1.5 meter sphere with high reflectance coating
D204 total luminous flux and spectral flux standard lamp certified by NIM

Test Objectives

Goniometric measurement:

Measure distribution photometry and input electrical parameters and report candela distribution, calculated lumen output, voltage (V), current (A) and power (W).

Sphere spectroradiometric measurement:

Measure sphere photometry and input electrical parameters and report the total flux output (lumens), Correlated Color Temperature (CCT), Color Rendering Index (CRI), Chromaticity Coordinates (x,y), Spectral Power Distribution (SPD), voltage (V), current (A) and power (W).

Test Procedures and Conditions

Goniometry:

Electrical conditions and physical orientation were set as required by the lamp manufacturer or the customer.

Ambient temperature was controlled at 25+/-1 degree Celsius and measured at the approximate height of the sample mounted on the Goniometer equipment.

Calibration was based on NIM certified total luminous flux and spectral flux standard lamp.

Lamps were stabilized per LM-79 requirements.

EVERFINE type C High Speed Mirror Goniometer was used to measure intensity (candela) at each angle of distribution.

Burn time during testing for each lamp: 2 hours

Stabilization time during testing for each lamp: 0.5 hours

Sphere Spectroradiometry

Electrical conditions and physical orientation were set as required by the luminaires/lamps manufacturer or the customer.

Ambient temperature was controlled at 25+/-1 degree Celsius and measured inside of the sphere, shielded from direct radiation of the lamp.

Calibration was based on NIM certified total luminous flux and spectral flux standard lamp.

Luminaires/lamps were stabilized per LM-79 requirements.

HAAS-2000 Spectroradiometer attached to 1.5 meter sphere painted with high reflectance paint (＞98%) was used to measure correlated color temperature, chromaticity coordinates, color rendering index, total luminous flux and spectral power distribution. Sphere measurement was set up in 4π geometry and used continuous self-absorption correction.

Burn time during testing for each luminaires/lamps: 2 hours

Stabilization time during testing for each luminaires/lamps: 0.5 hours

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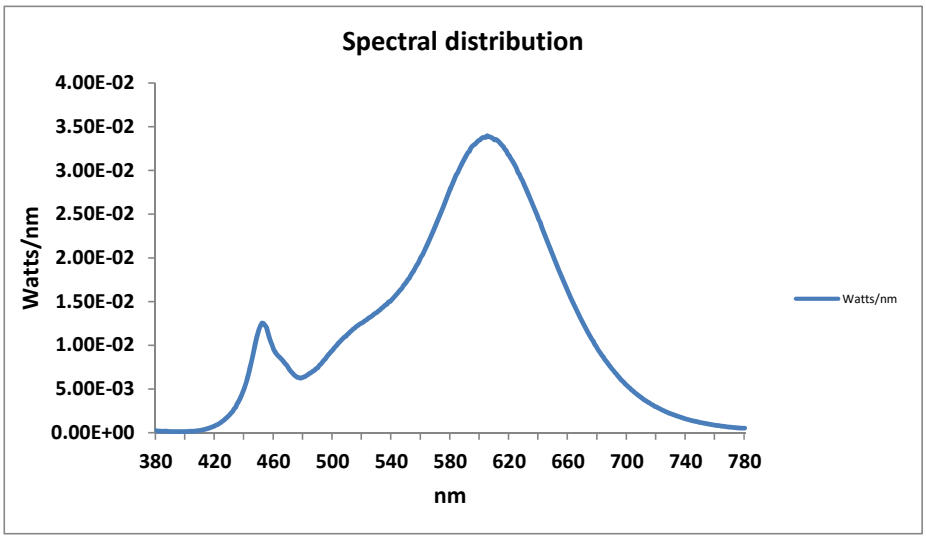
Test data in 2700K

Average Sphere Spectroradiometry Test Data

Lamp Volts(V)	Lamp Current(A)	Lamp Watts(W)	Power Factor	Lumens (lm)	LPW (lm/W)
120.02	0.197	13.1	0.555	1502.0	114.4

CCX	CCY	u′	v′	Duv	CCT(K)	CRI	R9	Rf	Rg
0.4576	0.4057	0.2632	0.5251	-0.0016	2693	81.5	3.3	83	95

Spectral Power Distribution



nm	Watts/nm
380	2.43E-04
385	1.68E-04
390	1.19E-04
395	1.17E-04
400	1.39E-04
405	1.70E-04
410	2.64E-04
415	4.65E-04
420	7.90E-04
425	1.31E-03
430	2.05E-03
435	3.24E-03
440	5.12E-03
445	8.23E-03
450	1.19E-02
455	1.20E-02
460	9.53E-03

nm	Watts/nm
465	8.44E-03
470	7.40E-03
475	6.45E-03
480	6.37E-03
485	6.83E-03
490	7.47E-03
495	8.44E-03
500	9.45E-03
505	1.05E-02
510	1.12E-02
515	1.20E-02
520	1.26E-02
525	1.32E-02
530	1.38E-02
535	1.45E-02
540	1.52E-02
545	1.61E-02

nm	Watts/nm
550	1.72E-02
555	1.85E-02
560	2.01E-02
565	2.18E-02
570	2.37E-02
575	2.58E-02
580	2.79E-02
585	2.97E-02
590	3.14E-02
595	3.28E-02
600	3.35E-02
605	3.40E-02
610	3.35E-02
615	3.29E-02
620	3.17E-02
625	3.02E-02
630	2.84E-02

nm	Watts/nm
635	2.65E-02
640	2.44E-02
645	2.23E-02
650	2.01E-02
655	1.81E-02
660	1.61E-02
665	1.43E-02
670	1.26E-02
675	1.10E-02
680	9.62E-03
685	8.37E-03
690	7.26E-03
695	6.27E-03
700	5.39E-03
705	4.63E-03
710	3.98E-03
715	3.42E-03

nm	Watts/nm
720	2.94E-03
725	2.52E-03
730	2.16E-03
735	1.85E-03
740	1.59E-03
745	1.35E-03
750	1.16E-03
755	1.00E-03
760	8.61E-04
765	7.38E-04
770	6.39E-04
775	5.55E-04
780	5.09E-04

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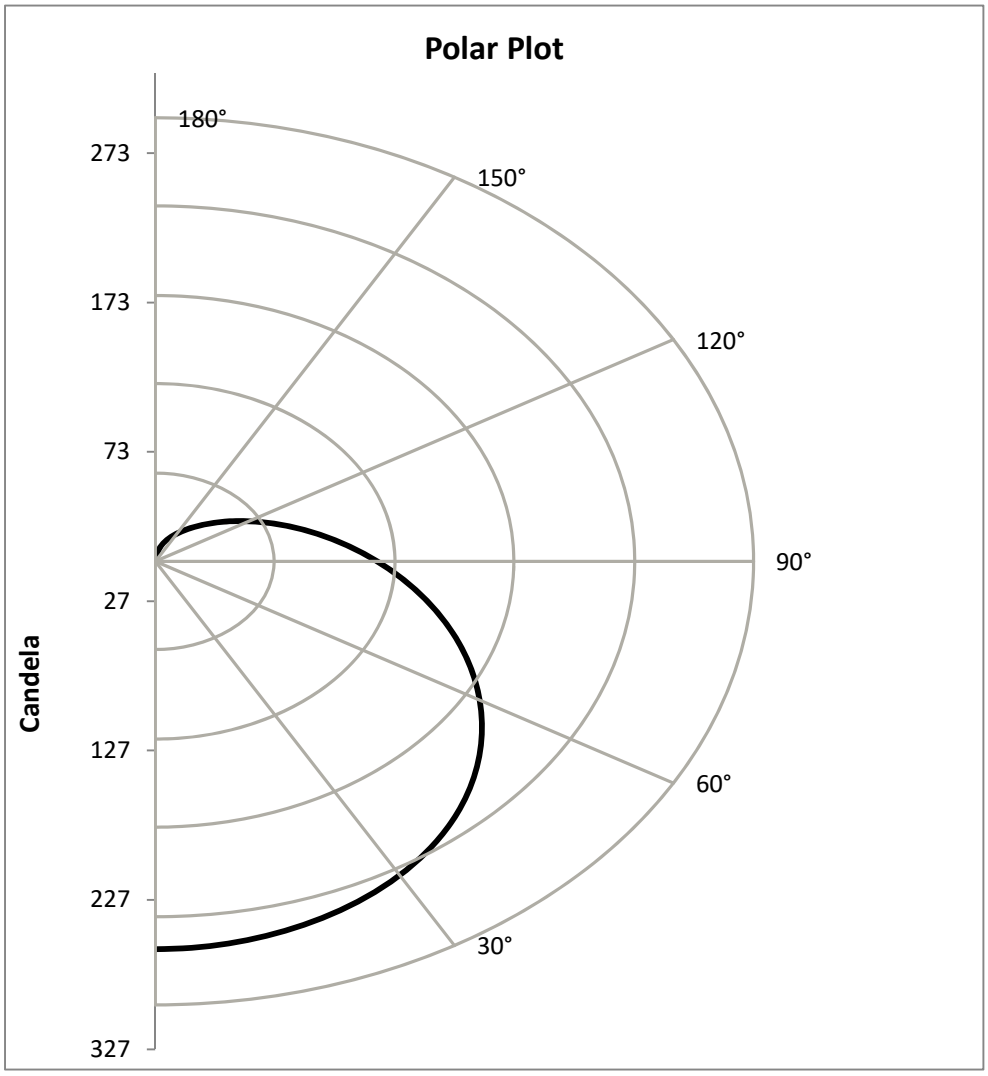
Average Goniometry Test Data

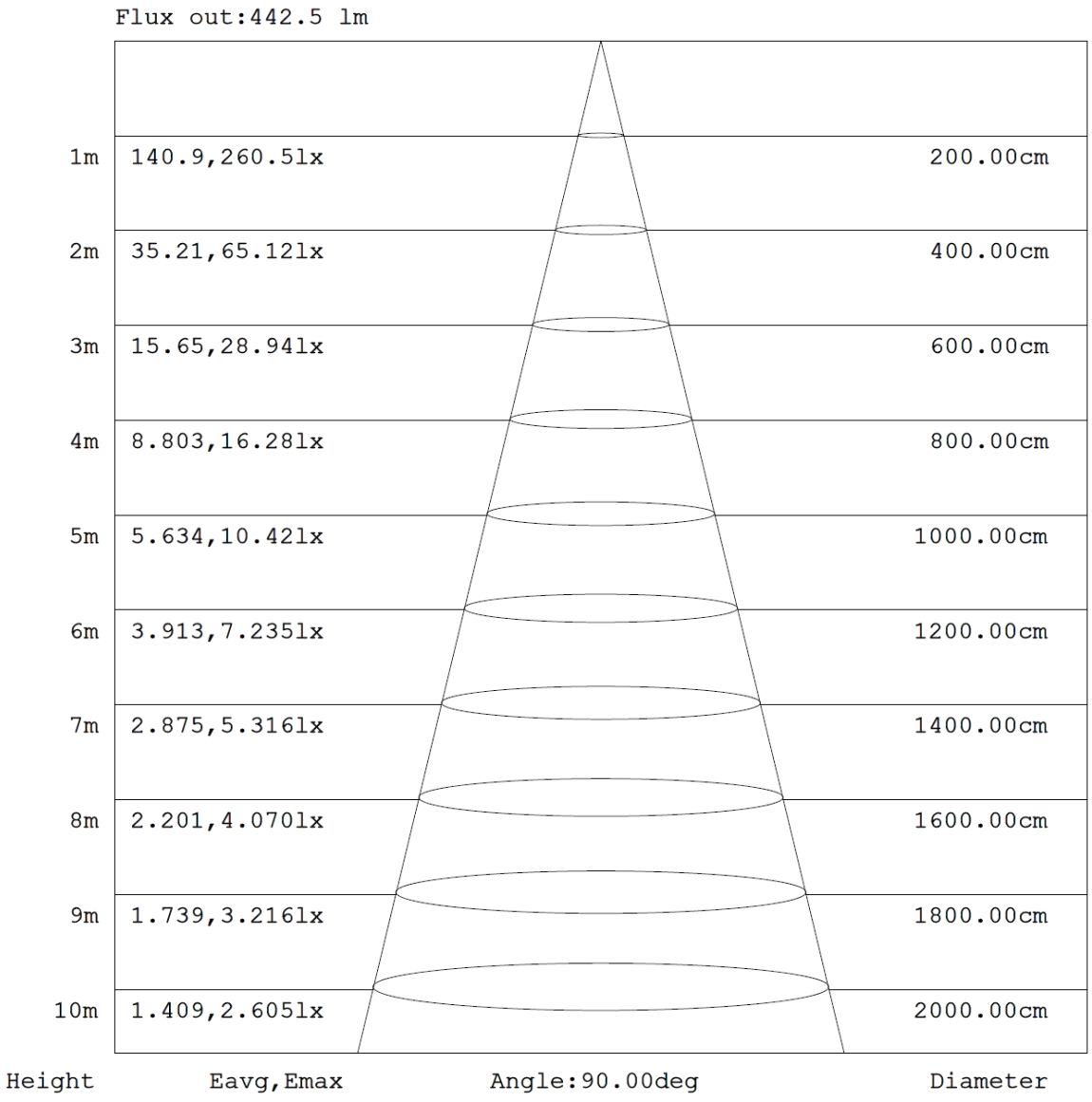
Beam Angle				Color Distribution
	Candela	Half Angle	Full Angle	Δu'v'
Max	260	0.0	-----	-----
50%of Max	130	81.5	163.0	-----
10%of Max	26	-----	-----	-----

Volts	Amps	Watts	PF
120.01	0.205	13.3	0.541
Total Downlight Lumens:			1167.5
Total Uplight Lumens:			349.6
Total Lumens:			1517.1
Total Lumens/ Watt:			114.2

Intensity Distribution

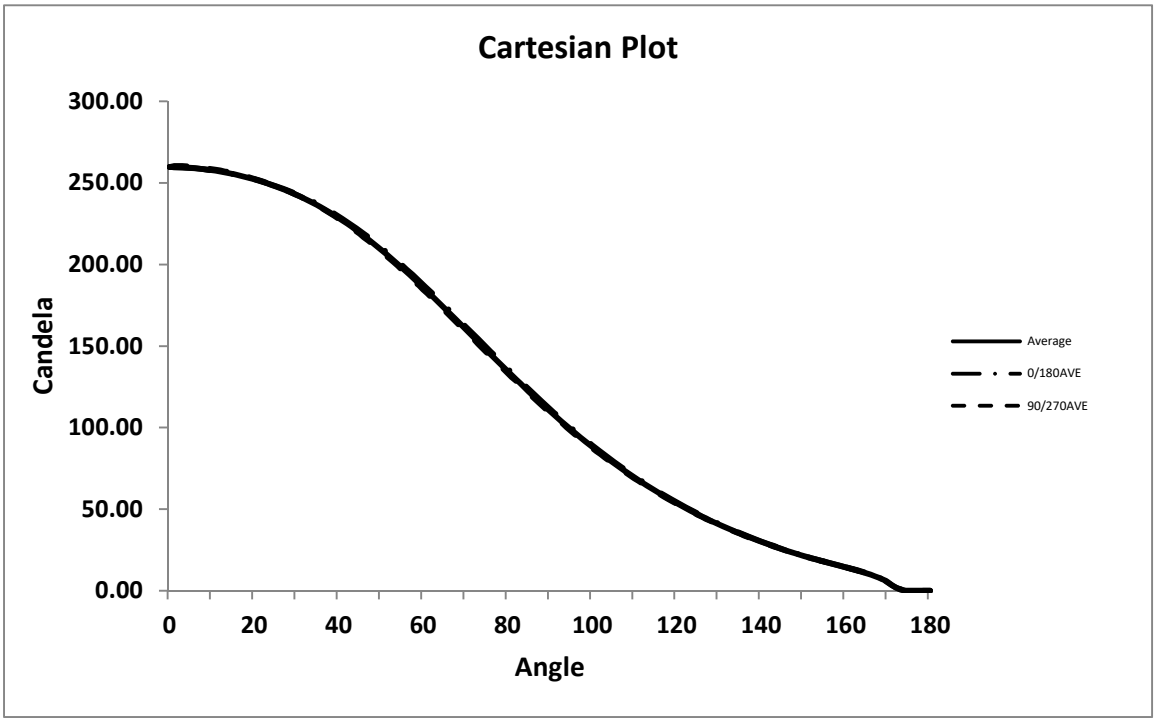


Cone Diagram



Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Cartesian Plot



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Test Request Number: BG-NW250110-4-01

Cartesian Distribution

Angle	Average cd	0/180 Average	90/270 Average	Zonal Lumens	Cumulative Lumens	%Total
0	259.67	259.67	259.67	0.00	0.00	0.00%
5	259.19	259.08	259.90	6.20	6.20	0.41%
10	257.78	257.61	258.46	18.49	24.70	1.63%
15	255.44	255.47	256.05	30.44	55.14	3.63%
20	252.12	252.21	252.52	41.83	96.97	6.39%
25	247.90	248.14	248.14	52.45	149.42	9.85%
30	242.66	243.10	242.63	62.09	211.51	13.94%
35	236.23	236.98	235.99	70.53	282.04	18.59%
40	228.45	229.42	227.98	77.54	359.58	23.70%
45	219.40	220.61	218.70	82.93	442.51	29.17%
50	209.17	210.62	208.19	86.60	529.11	34.88%
55	197.93	199.55	196.77	88.52	617.64	40.71%
60	185.96	187.63	184.69	88.73	706.37	46.56%
65	173.38	175.11	172.04	87.35	793.72	52.32%
70	160.45	162.16	159.12	84.52	878.23	57.89%
75	147.45	149.12	146.19	80.47	958.70	63.20%
80	134.62	136.17	133.44	75.45	1034.16	68.17%
85	122.12	123.59	121.06	69.74	1103.90	72.77%
90	110.15	111.44	109.20	63.57	1167.46	76.96%
95	98.83	99.97	98.00	57.19	1224.65	80.73%
100	88.26	89.29	87.54	50.80	1275.46	84.07%
105	78.47	79.34	77.86	44.58	1320.04	87.01%
110	69.46	70.23	68.94	38.64	1358.68	89.56%
115	61.22	61.85	60.79	33.07	1391.75	91.74%
120	53.71	54.26	53.35	27.92	1419.68	93.58%
125	46.89	47.35	46.63	23.24	1442.92	95.11%
130	40.70	41.08	40.49	19.04	1461.96	96.37%
135	35.09	35.40	34.94	15.31	1477.28	97.38%
140	30.03	30.29	29.93	12.06	1489.33	98.17%
145	25.48	25.67	25.42	9.26	1498.60	98.78%
150	21.40	21.52	21.41	6.90	1505.50	99.24%
155	17.77	17.84	17.85	4.96	1510.46	99.57%
160	14.35	14.39	14.52	3.38	1513.84	99.79%
165	10.62	10.71	10.87	2.08	1515.92	99.93%
170	5.06	5.60	5.40	0.99	1516.91	99.99%
175	0.02	0.02	0.02	0.14	1517.05	100.00%
180	0.00	0.00	0.00	0.00	1517.05	100.00%

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Individual Lamp Data- Sphere

Position	Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	PF	Luminous Lumens (lm)	LPW (lm/W)	CCX	CCY	CCT (K)	CRI	R9	Duv	Rf	Rg
VBU	1	120.02	0.201	13.2	0.546	1518.1	115.3	0.4581	0.4061	2690	81.5	3.5	-0.0015	84	95
	2	120.02	0.200	13.1	0.546	1504.6	115.0	0.4583	0.4064	2689	81.5	3.3	-0.0014	84	95
	3	120.02	0.198	13.0	0.548	1478.1	113.6	0.4580	0.4055	2687	81.4	3.1	-0.0017	83	95
	4	120.02	0.201	13.1	0.545	1467.5	111.7	0.4582	0.4057	2684	81.3	2.9	-0.0017	83	95
	5	120.01	0.201	13.2	0.546	1502.4	113.9	0.4576	0.4054	2692	81.4	3.1	-0.0017	83	95
VBD	7	120.03	0.190	13.0	0.568	1518.6	117.2	0.4573	0.4059	2700	81.6	3.8	-0.0015	84	95
	8	120.03	0.198	13.1	0.550	1505.5	115.0	0.4579	0.4060	2692	81.5	3.3	-0.0015	83	95
	9	120.03	0.195	13.3	0.567	1510.0	113.9	0.4569	0.4050	2697	81.5	3.7	-0.0018	83	95
	10	120.03	0.195	13.3	0.567	1512.9	114.2	0.4568	0.4055	2704	81.5	3.3	-0.0016	83	95
	11	120.03	0.192	13.1	0.572	1502.6	114.4	0.4573	0.4055	2696	81.5	3.4	-0.0017	83	96
Average		**120.02**	**0.197**	**13.1**	**0.555**	**1502.0**	**114.4**	**0.4576**	**0.4057**	**2693**	**81.5**	**3.3**	**-0.0016**	**83**	**95**

Individual Lamp Data- Goniometer

Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	Total Lumens (lm)	Beam Angle （°）	CBCP （cd）	90 cone lumen(lm)	E*Δu'v'
1	120.01	0.205	13.3	1517.1	163.0	260	442.5	---

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Test Request Number: BG-NW250110-4-01

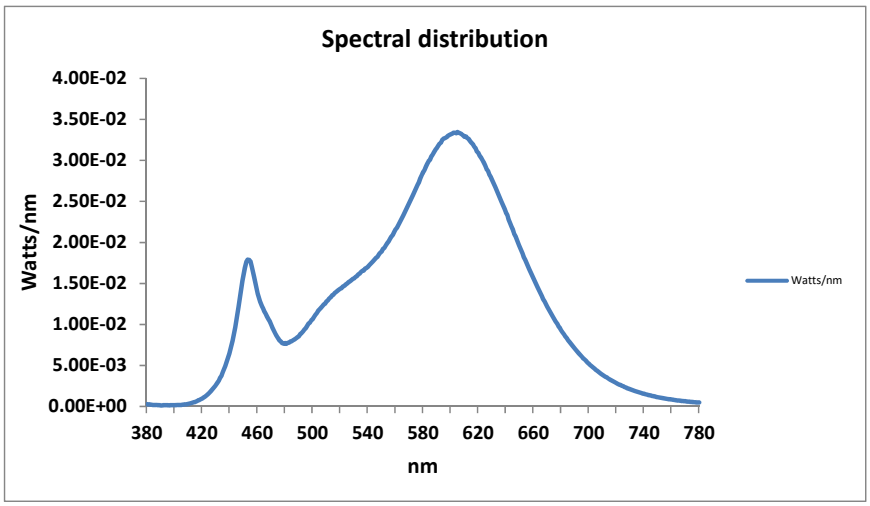
Test data in 3000K

Average Sphere Spectroradiometry Test Data

Lamp Volts(V)	Lamp Current(A)	Lamp Watts(W)	Power Factor	Lumens (lm)	LPW (lm/W)
120.03	0.200	13.2	0.551	1585.6	119.7

CCX	CCY	u′	v′	Duv	CCT(K)	CRI	R9	Rf	Rg
0.4357	0.3959	0.2533	0.5179	-0.0031	2954	83.2	10.1	84	96

Spectral Power Distribution



nm	Watts/nm
380	2.70E-04
385	1.96E-04
390	1.43E-04
395	1.48E-04
400	1.58E-04
405	1.97E-04
410	3.15E-04
415	5.62E-04
420	9.79E-04
425	1.65E-03
430	2.63E-03
435	4.19E-03
440	6.66E-03
445	1.07E-02
450	1.62E-02
455	1.77E-02
460	1.39E-02

nm	Watts/nm
465	1.16E-02
470	9.96E-03
475	8.30E-03
480	7.71E-03
485	7.98E-03
490	8.56E-03
495	9.54E-03
500	1.07E-02
505	1.19E-02
510	1.28E-02
515	1.36E-02
520	1.44E-02
525	1.50E-02
530	1.56E-02
535	1.64E-02
540	1.70E-02
545	1.80E-02

nm	Watts/nm
550	1.89E-02
555	2.01E-02
560	2.16E-02
565	2.31E-02
570	2.48E-02
575	2.67E-02
580	2.85E-02
585	3.01E-02
590	3.15E-02
595	3.27E-02
600	3.32E-02
605	3.35E-02
610	3.29E-02
615	3.22E-02
620	3.09E-02
625	2.94E-02
630	2.76E-02

nm	Watts/nm
635	2.57E-02
640	2.37E-02
645	2.16E-02
650	1.95E-02
655	1.75E-02
660	1.56E-02
665	1.38E-02
670	1.22E-02
675	1.06E-02
680	9.29E-03
685	8.08E-03
690	7.02E-03
695	6.07E-03
700	5.22E-03
705	4.49E-03
710	3.87E-03
715	3.32E-03

nm	Watts/nm
720	2.85E-03
725	2.45E-03
730	2.10E-03
735	1.81E-03
740	1.55E-03
745	1.33E-03
750	1.14E-03
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760	8.44E-04
765	7.25E-04
770	6.29E-04
775	5.47E-04
780	5.02E-04

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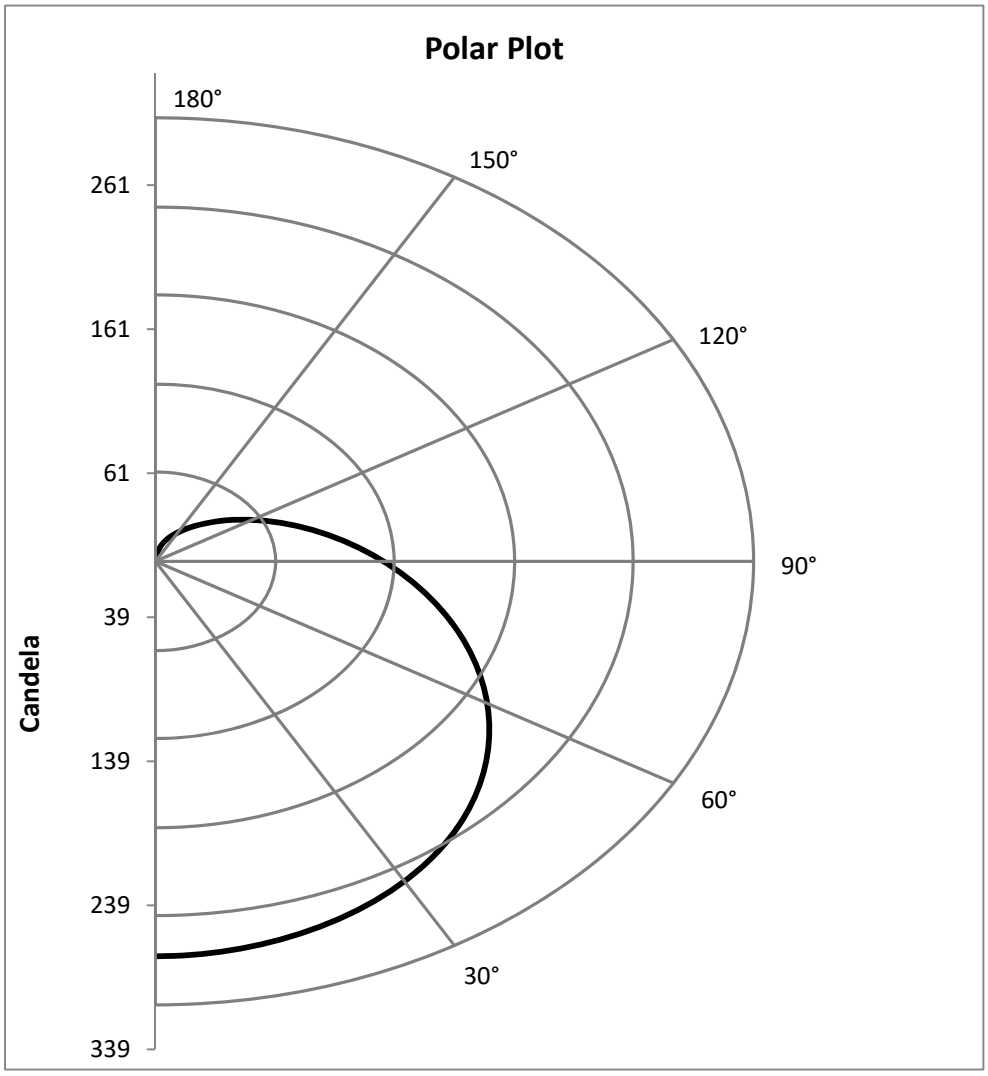
Average Goniometry Test Data

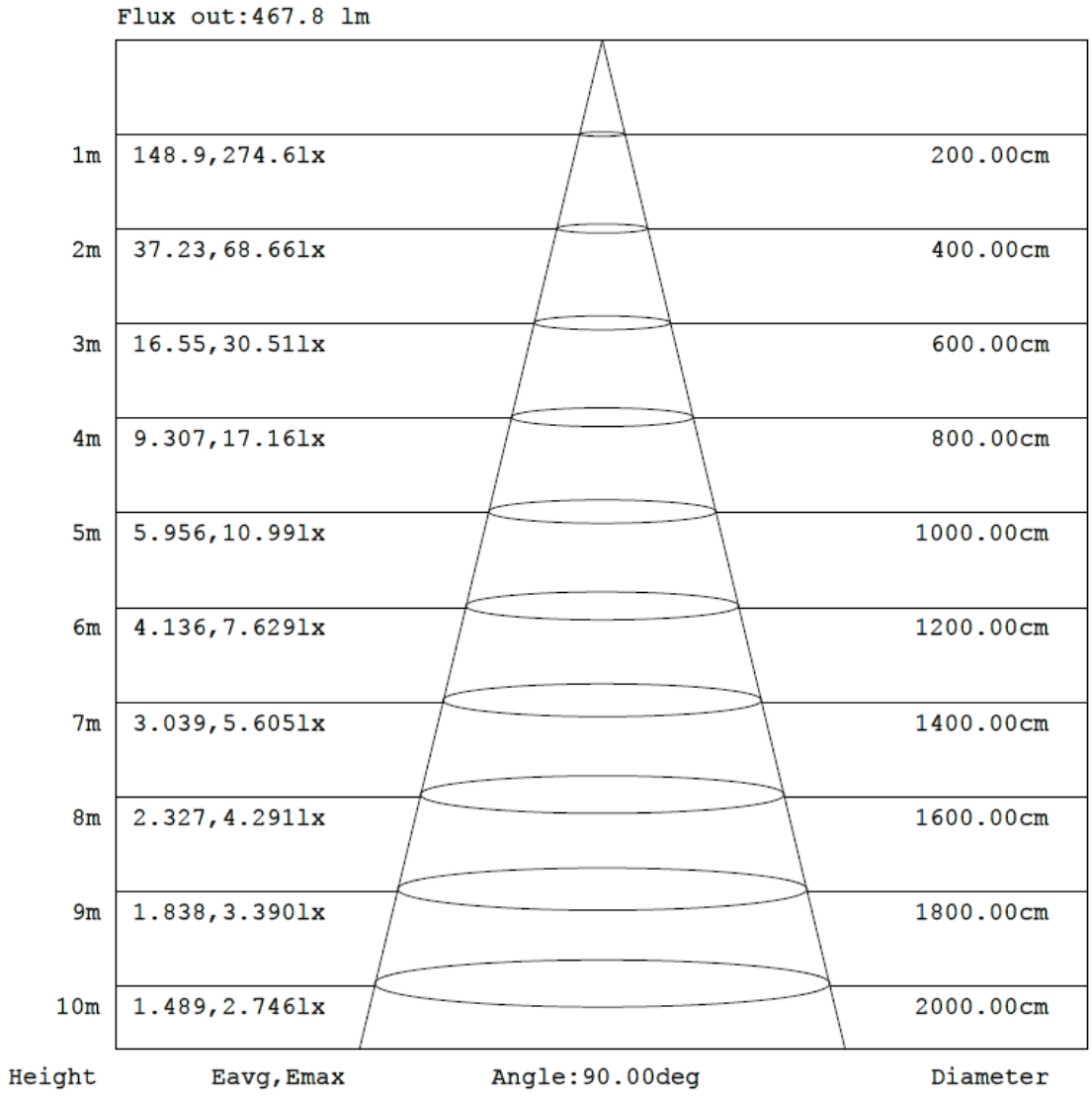
Beam Angle				Color Distribution
	Candela	Half Angle	Full Angle	Δu'v'
Max	275	0.0	-----	-----
50%of Max	138	82.0	164.1	-----
10%of Max	28	-----	-----	-----

Volts	Amps	Watts	PF
120.00	0.207	13.4	0.541
Total Downlight Lumens:			1237.9
Total Uplight Lumens:			374.3
Total Lumens:			1612.2
Total Lumens/ Watt:			120.3

Intensity Distribution

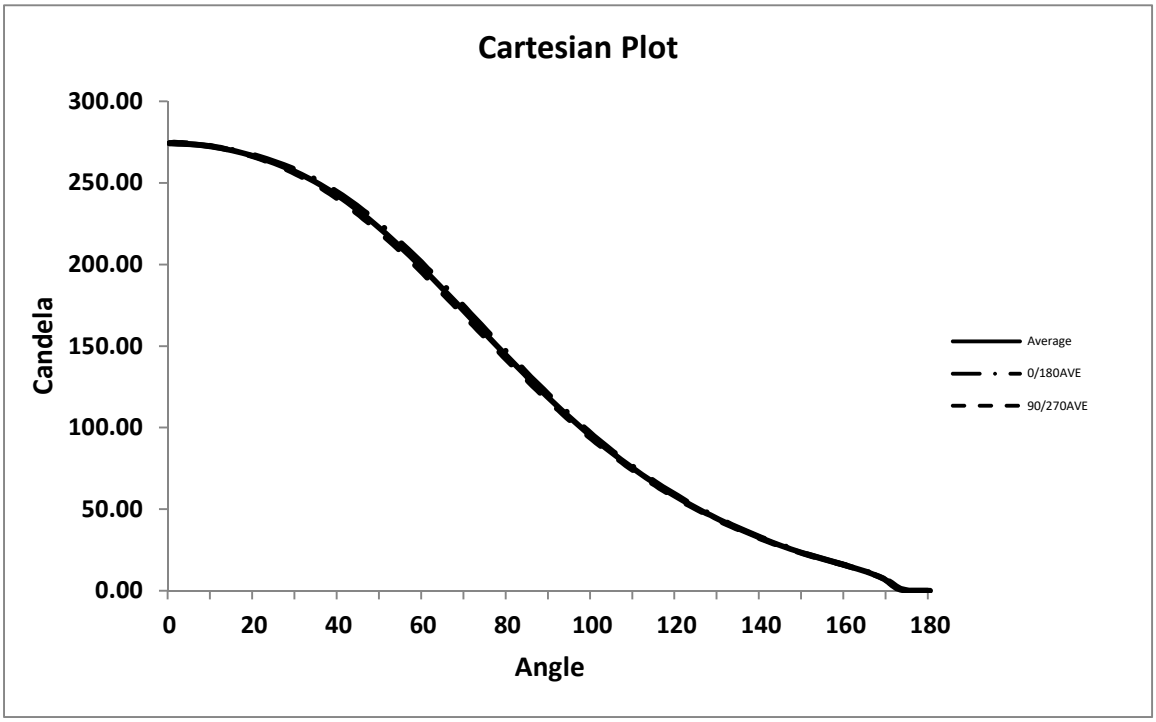


Cone Diagram



Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Cartesian Plot



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Cartesian Distribution

Angle	Average cd	0/180 Average	90/270 Average	Zonal Lumens	Cumulative Lumens	%Total
0	274.21	274.21	274.21	0.00	0.00	0.00%
5	273.66	273.64	273.98	6.55	6.55	0.41%
10	272.22	272.33	272.42	19.53	26.08	1.62%
15	269.75	270.06	269.81	32.15	58.22	3.61%
20	266.34	266.93	266.04	44.18	102.41	6.35%
25	261.94	262.89	261.28	55.41	157.81	9.79%
30	256.51	257.83	255.46	65.62	223.43	13.86%
35	249.82	251.56	248.34	74.57	298.00	18.48%
40	241.73	243.89	239.84	82.03	380.03	23.57%
45	232.30	234.71	230.12	87.78	467.81	29.02%
50	221.60	224.29	219.16	91.73	559.53	34.71%
55	209.87	212.71	207.24	93.82	653.36	40.53%
60	197.31	200.24	194.56	94.12	747.47	46.36%
65	184.12	187.01	181.37	92.72	840.19	52.11%
70	170.54	173.38	167.91	89.79	929.98	57.68%
75	156.86	159.50	154.39	85.56	1015.54	62.99%
80	143.33	145.78	141.08	80.30	1095.84	67.97%
85	130.15	132.36	128.12	74.29	1170.13	72.58%
90	117.50	119.46	115.69	67.78	1237.91	76.78%
95	105.53	107.24	103.97	61.03	1298.94	80.57%
100	94.32	95.83	92.94	54.27	1353.22	83.94%
105	83.93	85.24	82.76	47.67	1400.88	86.89%
110	74.36	75.50	73.34	41.35	1442.23	89.46%
115	65.58	66.56	64.70	35.42	1477.65	91.65%
120	57.57	58.41	56.82	29.93	1507.57	93.51%
125	50.29	51.01	49.68	24.92	1532.50	95.06%
130	43.69	44.31	43.15	20.43	1552.93	96.32%
135	37.69	38.21	37.25	16.44	1569.37	97.34%
140	32.28	32.71	31.93	12.95	1582.32	98.15%
145	27.41	27.77	27.14	9.96	1592.28	98.76%
150	23.06	23.33	22.86	7.43	1599.72	99.22%
155	19.20	19.39	19.07	5.35	1605.07	99.56%
160	15.56	15.69	15.54	3.66	1608.73	99.78%
165	11.56	11.80	11.60	2.26	1610.99	99.92%
170	5.58	6.33	5.83	1.08	1612.07	99.99%
175	0.02	0.03	0.02	0.14	1612.22	100.00%
180	0.00	0.00	0.00	0.00	1612.22	100.00%

LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

Individual Lamp Data- Sphere

Position	Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	PF	Luminous Lumens (lm)	LPW (lm/W)	CCX	CCY	CCT (K)	CRI	R9	Duv	Rf	Rg
VBU	1	120.02	0.204	13.3	0.546	1590.3	119.2	0.4357	0.3960	2953	83.3	10.2	-0.0031	84	96
	2	120.02	0.202	13.2	0.545	1569.7	118.6	0.4361	0.3963	2951	83.1	9.7	-0.0030	84	96
	3	120.02	0.200	13.2	0.548	1567.3	119.2	0.4363	0.3960	2943	83.2	9.9	-0.0032	84	97
	4	120.02	0.203	13.3	0.546	1563.6	117.9	0.4361	0.3961	2949	83.2	10.1	-0.0031	84	96
	5	120.02	0.203	13.3	0.546	1587.7	119.2	0.4358	0.3956	2950	83.2	10.0	-0.0033	84	97
VBD	7	120.03	0.197	13.1	0.556	1595.7	121.5	0.4352	0.3959	2961	83.3	10.3	-0.0031	84	96
	8	120.03	0.195	13.1	0.560	1595.6	121.6	0.4353	0.3959	2961	83.3	10.3	-0.0031	84	96
	9	120.03	0.200	13.2	0.552	1589.8	120.2	0.4359	0.3961	2952	83.2	10.1	-0.0031	84	96
	10	120.03	0.200	13.4	0.558	1601.6	119.5	0.4355	0.3960	2958	83.2	9.9	-0.0031	84	97
	11	120.03	0.200	13.3	0.553	1594.2	120.0	0.4350	0.3955	2961	83.3	10.3	-0.0032	84	97
Average		**120.03**	**0.200**	**13.2**	**0.551**	**1585.6**	**119.7**	**0.4357**	**0.3959**	**2954**	**83.2**	**10.1**	**-0.0031**	**84**	**96**

Individual Lamp Data- Goniometer

Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	Total Lumens (lm)	Beam Angle （°）	CBCP （cd）	90 cone lumen(lm)	E*Δu'v'
1	120.00	0.207	13.4	1612.2	164.1	275	467.8	---

LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

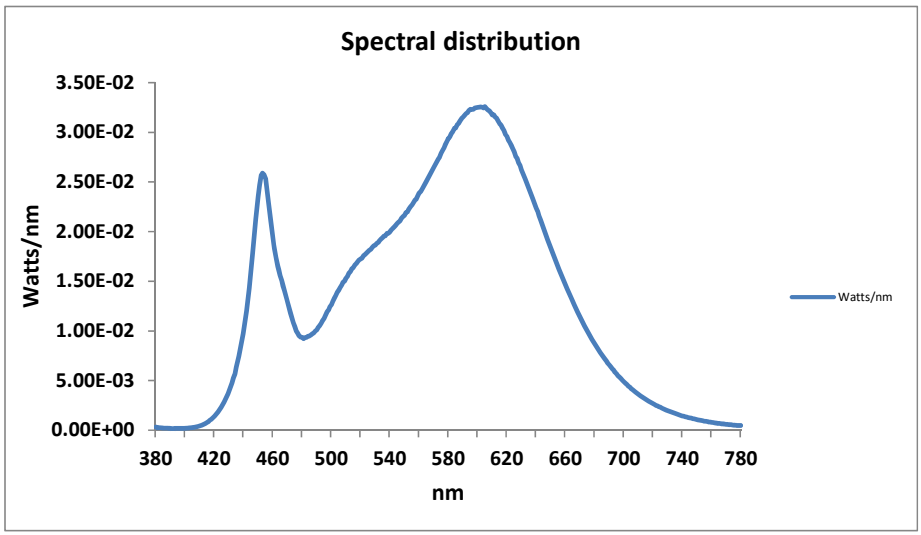
Test data in 3500K

Average Sphere Spectroradiometry Test Data

Lamp Volts(V)	Lamp Current(A)	Lamp Watts(W)	Power Factor	Lumens (lm)	LPW (lm/W)
120.03	0.201	13.5	0.559	1692.7	125.7

CCX	CCY	u′	v′	Duv	CCT(K)	CRI	R9	Rf	Rg
0.4063	0.3830	0.2396	0.5082	-0.0036	3414	85.0	17.1	85	97

Spectral Power Distribution



nm	Watts/nm
380	3.19E-04
385	2.28E-04
390	1.82E-04
395	1.80E-04
400	2.02E-04
405	2.72E-04
410	4.28E-04
415	7.88E-04
420	1.41E-03
425	2.42E-03
430	3.94E-03
435	6.33E-03
440	1.01E-02
445	1.60E-02
450	2.37E-02
455	2.53E-02
460	1.94E-02

nm	Watts/nm
465	1.56E-02
470	1.29E-02
475	1.04E-02
480	9.36E-03
485	9.48E-03
490	1.01E-02
495	1.13E-02
500	1.27E-02
505	1.41E-02
510	1.53E-02
515	1.64E-02
520	1.73E-02
525	1.80E-02
530	1.86E-02
535	1.94E-02
540	2.00E-02
545	2.08E-02

nm	Watts/nm
550	2.16E-02
555	2.27E-02
560	2.39E-02
565	2.51E-02
570	2.65E-02
575	2.79E-02
580	2.93E-02
585	3.04E-02
590	3.15E-02
595	3.23E-02
600	3.25E-02
605	3.26E-02
610	3.18E-02
615	3.09E-02
620	2.96E-02
625	2.80E-02
630	2.62E-02

nm	Watts/nm
635	2.43E-02
640	2.24E-02
645	2.04E-02
650	1.84E-02
655	1.65E-02
660	1.46E-02
665	1.30E-02
670	1.14E-02
675	9.97E-03
680	8.71E-03
685	7.58E-03
690	6.58E-03
695	5.69E-03
700	4.88E-03
705	4.20E-03
710	3.62E-03
715	3.10E-03

nm	Watts/nm
720	2.67E-03
725	2.30E-03
730	1.97E-03
735	1.69E-03
740	1.45E-03
745	1.25E-03
750	1.07E-03
755	9.19E-04
760	7.95E-04
765	6.86E-04
770	5.92E-04
775	5.22E-04
780	4.79E-04

LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

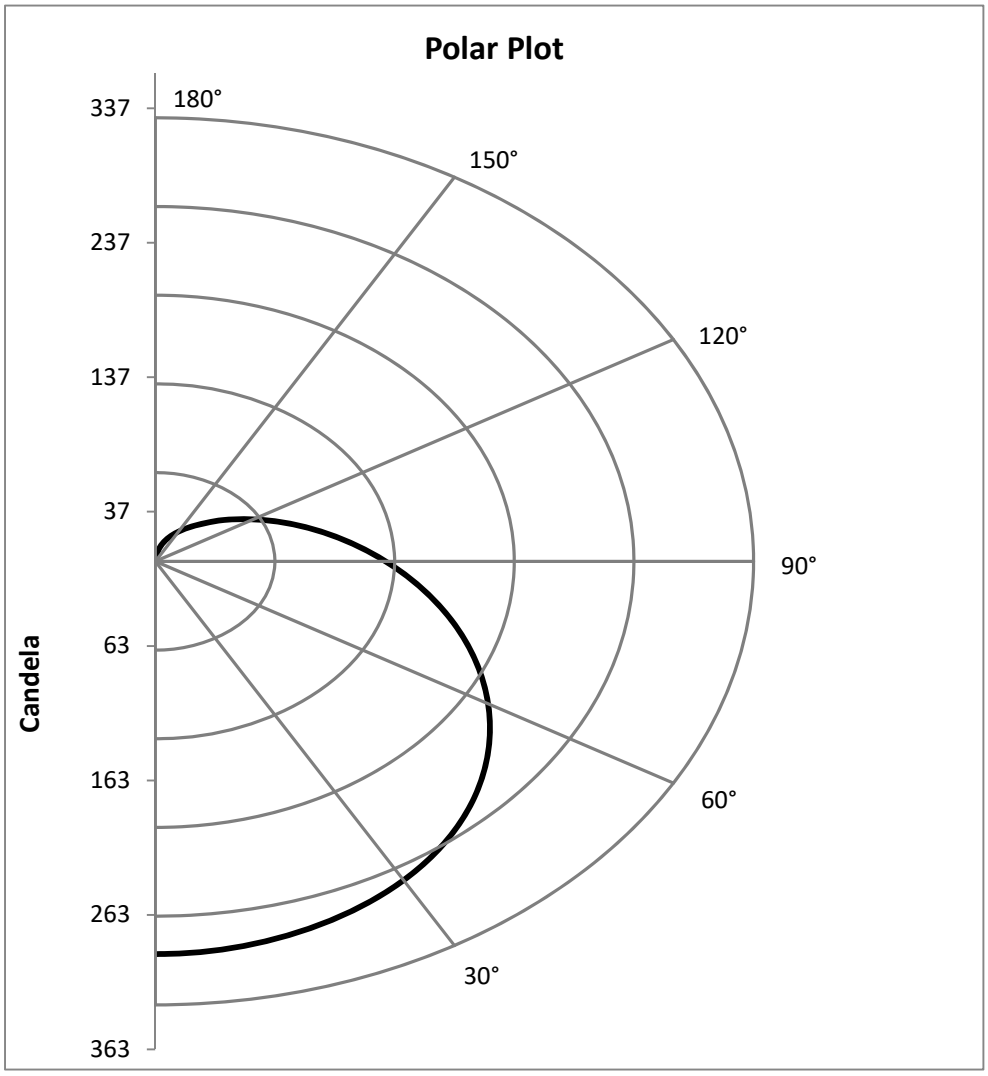
Test Request Number: BG-NW250110-4-01

Average Goniometry Test Data

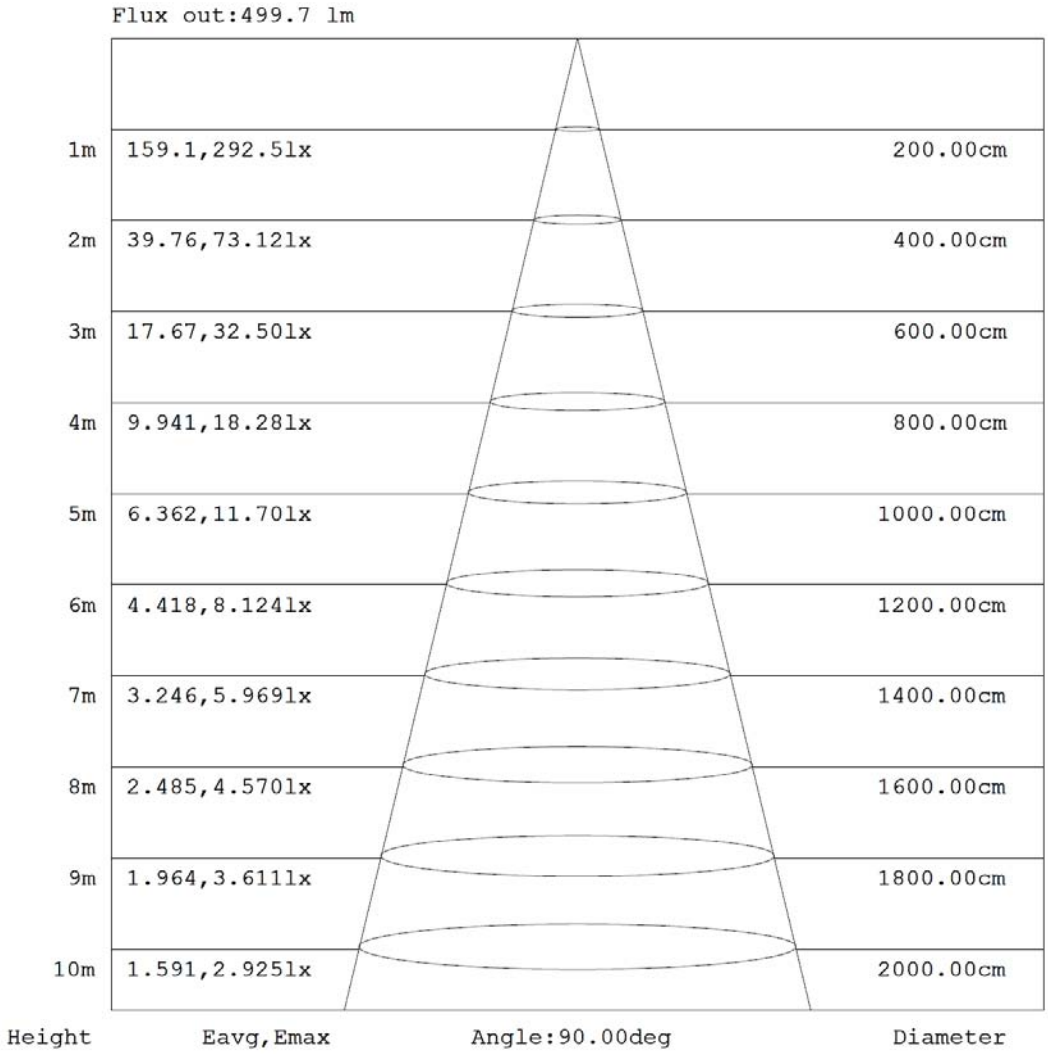
Beam Angle				Color Distribution
	Candela	Half Angle	Full Angle	Δu'v'
Max	292	0.0	-----	-----
50%of Max	146	82.8	165.6	-----
10%of Max	29	-----	-----	-----

Volts	Amps	Watts	PF
119.94	0.207	13.6	0.547
Total Downlight Lumens:			1328.2
Total Uplight Lumens:			406.3
Total Lumens:			1734.5
Total Lumens/ Watt:			128.0

Intensity Distribution

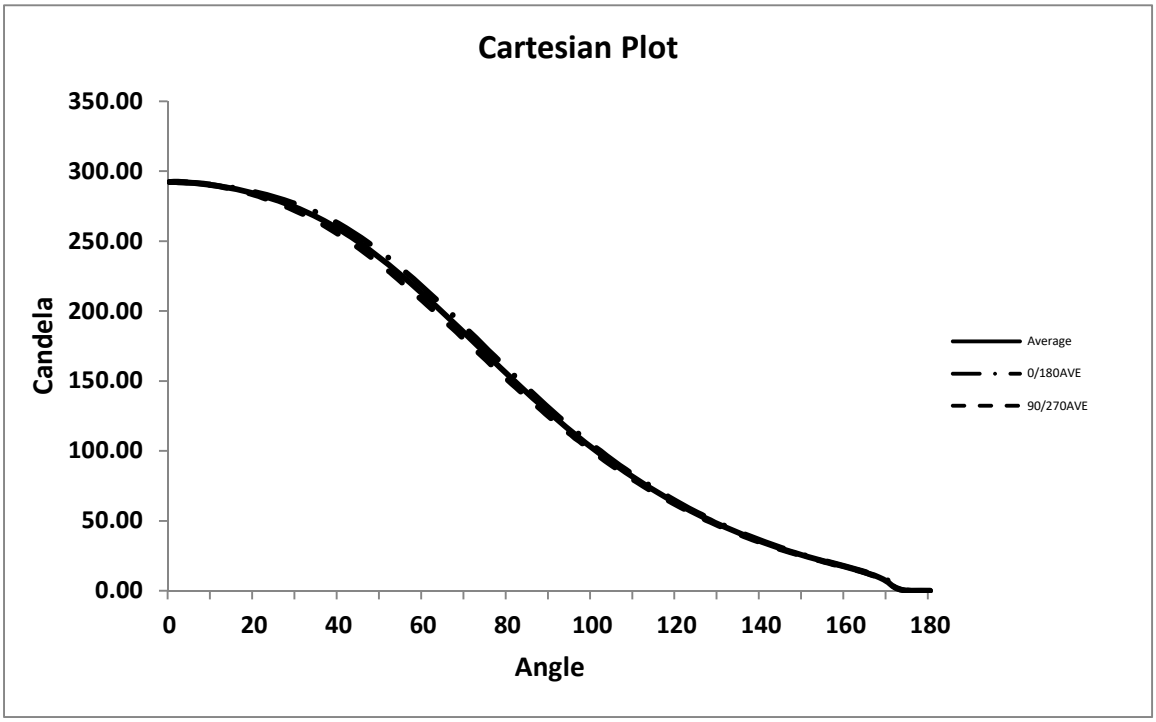


Cone Diagram



Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Cartesian Plot



LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

Cartesian Distribution

Angle	Average cd	0/180 Average	90/270 Average	Zonal Lumens	Cumulative Lumens	%Total
0	292.21	292.21	292.21	0.00	0.00	0.00%
5	291.69	291.75	291.88	6.98	6.98	0.40%
10	290.15	290.45	290.08	20.81	27.80	1.60%
15	287.59	288.27	287.14	34.27	62.07	3.58%
20	284.08	285.24	283.13	47.11	109.18	6.29%
25	279.54	281.32	277.91	59.11	168.29	9.70%
30	273.93	276.44	271.56	70.05	238.34	13.74%
35	267.00	270.25	263.95	79.67	318.01	18.33%
40	258.60	262.44	254.92	87.71	405.72	23.39%
45	248.77	253.08	244.59	93.96	499.67	28.81%
50	237.59	242.23	233.10	98.29	597.96	34.47%
55	225.24	230.04	220.55	100.64	698.60	40.28%
60	211.99	216.88	207.23	101.07	799.67	46.10%
65	198.04	202.83	193.36	99.67	899.34	51.85%
70	183.65	188.19	179.22	96.63	995.98	57.42%
75	169.08	173.27	164.97	92.18	1088.16	62.74%
80	154.67	158.49	150.95	86.61	1174.77	67.73%
85	140.59	144.00	137.24	80.20	1254.97	72.35%
90	127.05	130.07	124.11	73.25	1328.22	76.58%
95	114.22	116.84	111.63	66.03	1394.25	80.38%
100	102.17	104.42	99.94	58.77	1453.02	83.77%
105	91.00	92.94	89.07	51.66	1504.67	86.75%
110	80.68	82.36	79.01	44.85	1549.52	89.34%
115	71.21	72.65	69.77	38.44	1587.96	91.55%
120	62.56	63.80	61.33	32.50	1620.46	93.43%
125	54.68	55.76	53.63	27.09	1647.55	94.99%
130	47.54	48.47	46.63	22.22	1669.77	96.27%
135	41.05	41.86	40.27	17.90	1687.66	97.30%
140	35.19	35.90	34.54	14.11	1701.78	98.11%
145	29.92	30.52	29.38	10.86	1712.64	98.74%
150	25.23	25.72	24.77	8.12	1720.76	99.21%
155	21.04	21.42	20.71	5.86	1726.62	99.55%
160	17.09	17.40	16.88	4.01	1730.64	99.78%
165	12.76	13.16	12.56	2.49	1733.13	99.92%
170	6.23	7.29	6.03	1.20	1734.33	99.99%
175	0.02	0.03	0.02	0.16	1734.49	100.00%
180	0.00	0.00	0.00	0.00	1734.49	100.00%

LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

Individual Lamp Data- Sphere

Position	Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	PF	Luminous Lumens (lm)	LPW (lm/W)	CCX	CCY	CCT (K)	CRI	R9	Duv	Rf	Rg
VBU	1	120.02	0.206	13.5	0.547	1696.1	125.6	0.4063	0.3831	3414	85.0	17.1	-0.0036	85	97
	2	120.02	0.204	13.4	0.546	1675.7	125.1	0.4068	0.3834	3407	84.9	16.6	-0.0036	85	97
	3	120.02	0.203	13.4	0.549	1675.2	125.5	0.4071	0.3832	3397	85.0	16.8	-0.0037	85	97
	4	120.02	0.205	13.4	0.547	1669.3	124.2	0.4060	0.3832	3421	85.1	17.2	-0.0035	85	97
	5	120.02	0.206	13.5	0.547	1691.2	125.3	0.4065	0.3827	3407	85.0	17.2	-0.0038	85	97
VBD	7	120.03	0.197	13.3	0.564	1706.6	128.0	0.4064	0.3831	3413	85.1	17.2	-0.0036	85	97
	8	120.03	0.200	13.4	0.559	1697.7	126.4	0.4067	0.3833	3407	85.0	17.0	-0.0036	85	97
	9	120.03	0.195	13.6	0.583	1702.1	125.1	0.4052	0.3824	3432	85.2	17.9	-0.0037	85	97
	10	120.03	0.199	13.6	0.570	1711.8	125.7	0.4066	0.3832	3407	85.0	16.6	-0.0036	85	97
	11	120.03	0.194	13.5	0.579	1701.7	126.1	0.4052	0.3824	3432	85.1	17.3	-0.0037	85	97
Average		**120.03**	**0.201**	**13.5**	**0.559**	**1692.7**	**125.7**	**0.4063**	**0.3830**	**3414**	**85.0**	**17.1**	**-0.0036**	**85**	**97**

Individual Lamp Data- Goniometer

Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	Total Lumens (lm)	Beam Angle （°）	CBCP （cd）	90 cone lumen(lm)	E*Δu'v'
1	119.94	0.207	13.6	1734.5	165.6	292	499.7	---

LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

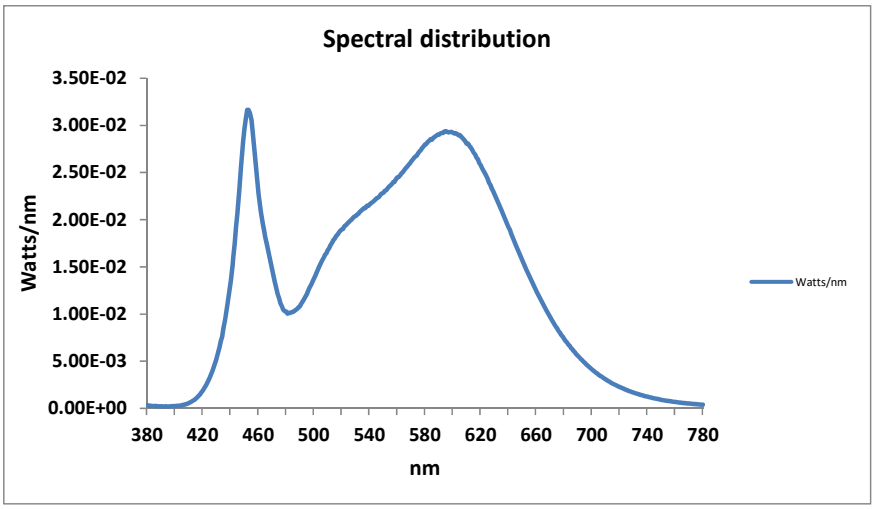
Test data in 4000K

Average Sphere Spectroradiometry Test Data

Lamp Volts(V)	Lamp Current(A)	Lamp Watts(W)	Power Factor	Lumens (lm)	LPW (lm/W)
120.03	0.198	13.2	0.554	1675.7	127.4

CCX	CCY	u′	v′	Duv	CCT(K)	CRI	R9	Rf	Rg
0.3784	0.3709	0.2261	0.4987	-0.0022	4011	85.3	18.6	85	96

Spectral Power Distribution



nm	Watts/nm
380	3.44E-04
385	2.56E-04
390	2.10E-04
395	2.03E-04
400	2.53E-04
405	3.44E-04
410	5.52E-04
415	1.05E-03
420	1.90E-03
425	3.29E-03
430	5.33E-03
435	8.56E-03
440	1.34E-02
445	2.08E-02
450	2.97E-02
455	3.06E-02
460	2.30E-02

nm	Watts/nm
465	1.81E-02
470	1.47E-02
475	1.16E-02
480	1.03E-02
485	1.02E-02
490	1.09E-02
495	1.21E-02
500	1.37E-02
505	1.54E-02
510	1.68E-02
515	1.80E-02
520	1.90E-02
525	1.98E-02
530	2.04E-02
535	2.11E-02
540	2.16E-02
545	2.23E-02

nm	Watts/nm
550	2.29E-02
555	2.36E-02
560	2.45E-02
565	2.53E-02
570	2.62E-02
575	2.71E-02
580	2.80E-02
585	2.85E-02
590	2.90E-02
595	2.94E-02
600	2.92E-02
605	2.90E-02
610	2.81E-02
615	2.71E-02
620	2.58E-02
625	2.43E-02
630	2.27E-02

nm	Watts/nm
635	2.10E-02
640	1.92E-02
645	1.74E-02
650	1.57E-02
655	1.40E-02
660	1.25E-02
665	1.10E-02
670	9.69E-03
675	8.47E-03
680	7.39E-03
685	6.43E-03
690	5.58E-03
695	4.82E-03
700	4.14E-03
705	3.57E-03
710	3.07E-03
715	2.64E-03

nm	Watts/nm
720	2.27E-03
725	1.95E-03
730	1.67E-03
735	1.45E-03
740	1.24E-03
745	1.07E-03
750	9.19E-04
755	7.92E-04
760	6.88E-04
765	5.91E-04
770	5.14E-04
775	4.50E-04
780	4.12E-04

LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

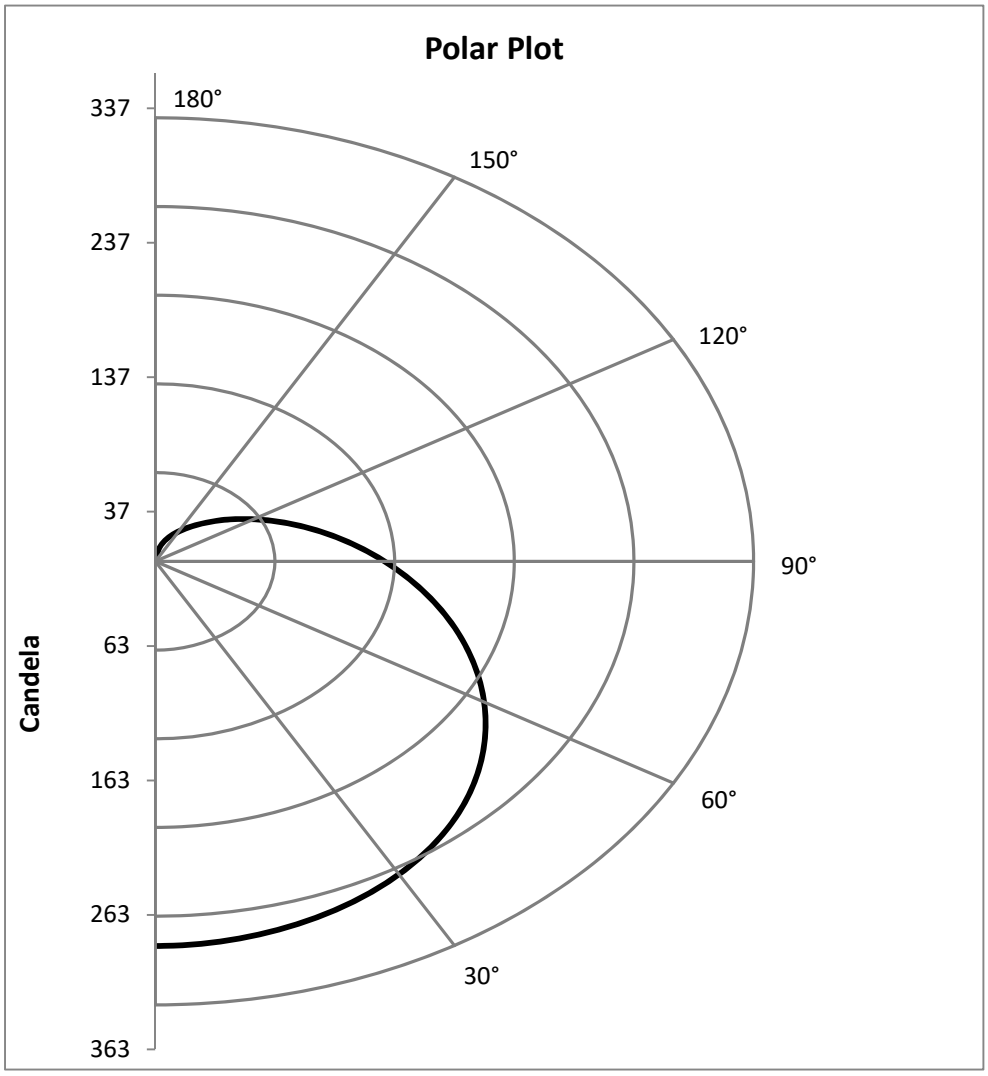
Test Request Number: BG-NW250110-4-01

Average Goniometry Test Data

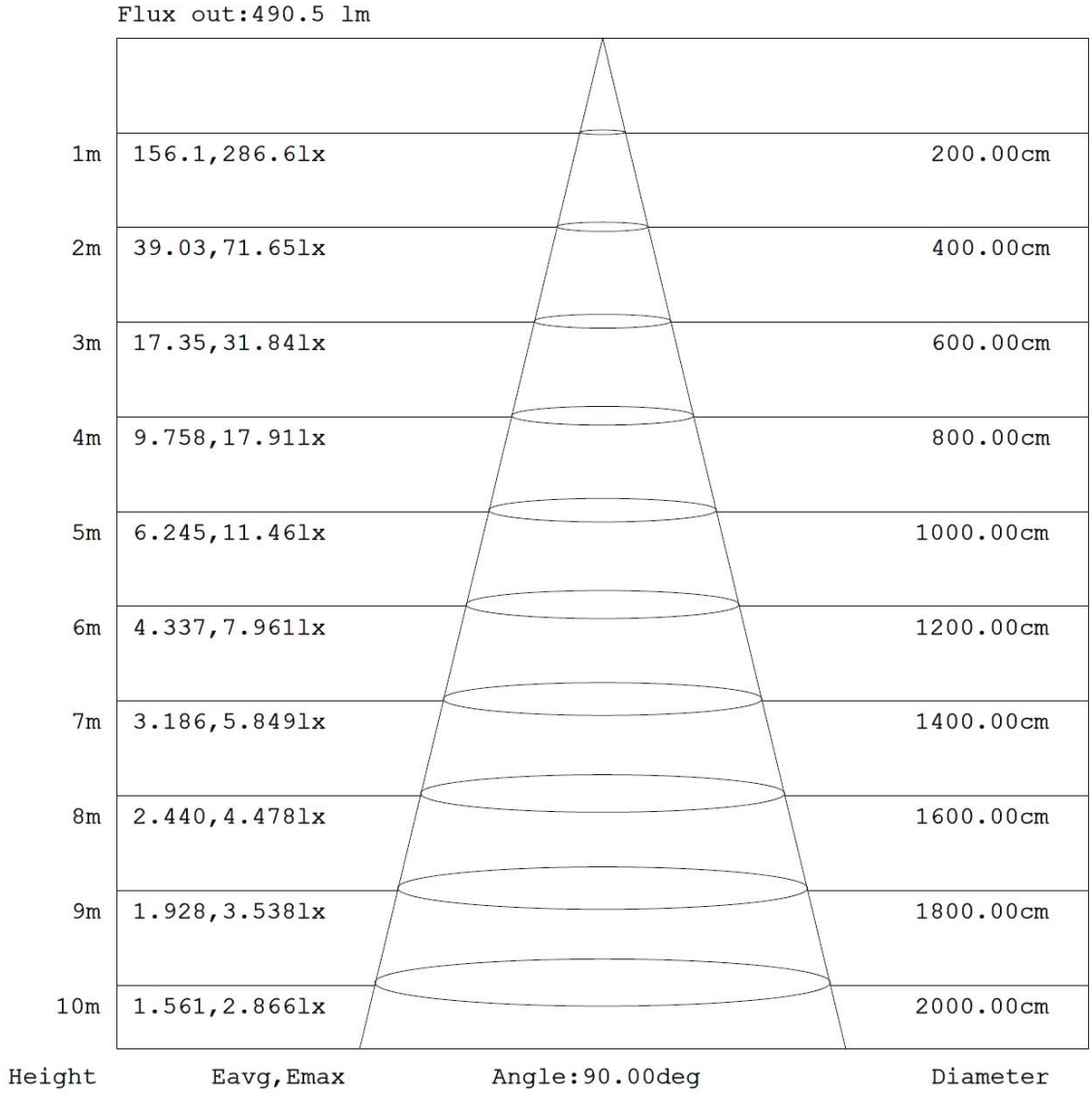
Beam Angle				Color Distribution
	Candela	Half Angle	Full Angle	Δu'v'
Max	287	1.0	-----	-----
50%of Max	144	83.6	167.2	-----
10%of Max	29	-----	-----	-----

Volts	Amps	Watts	PF
119.98	0.204	13.3	0.542
Total Downlight Lumens:			1310.4
Total Uplight Lumens:			406.5
Total Lumens:			1716.9
Total Lumens/ Watt:			129.2

Intensity Distribution

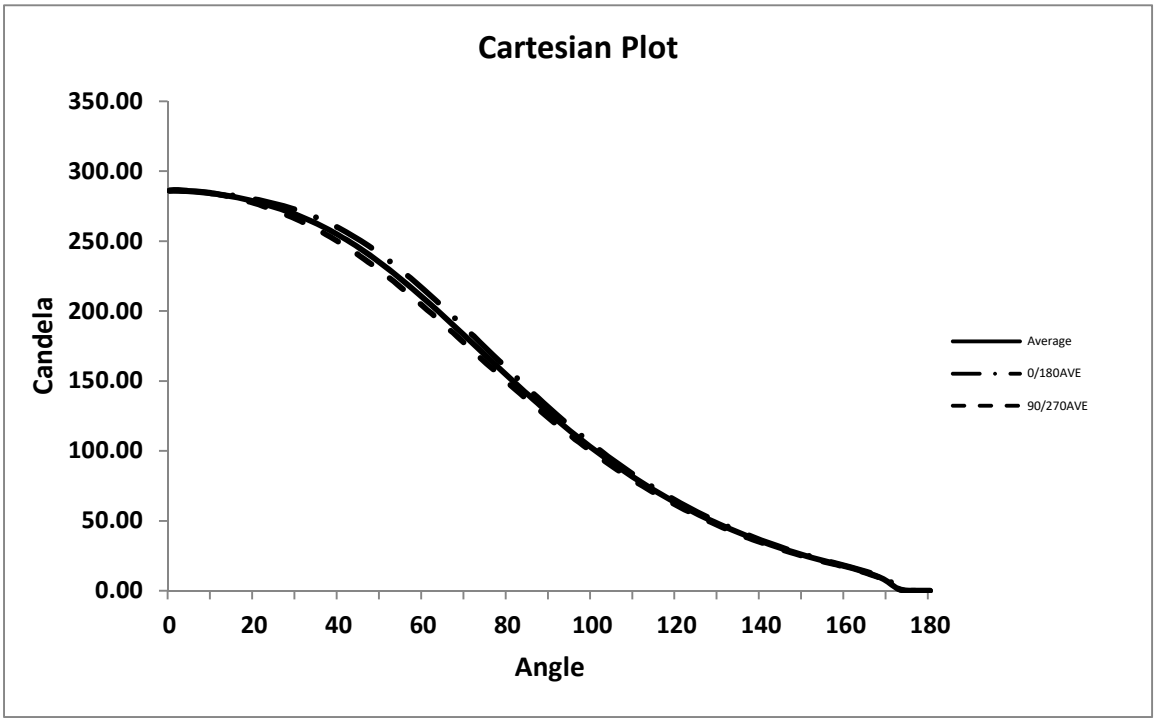


Cone Diagram



Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Cartesian Plot



LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

Cartesian Distribution

Angle	Average cd	0/180 Average	90/270 Average	Zonal Lumens	Cumulative Lumens	%Total
0	286.15	286.15	286.15	0.00	0.00	0.00%
5	285.61	285.62	285.93	6.84	6.84	0.40%
10	284.18	284.52	284.16	20.38	27.22	1.59%
15	281.74	282.66	281.22	33.57	60.79	3.54%
20	278.43	279.97	277.13	46.17	106.96	6.23%
25	274.14	276.62	271.95	57.95	164.92	9.61%
30	268.86	272.29	265.70	68.72	233.64	13.61%
35	262.27	266.65	258.21	78.23	311.87	18.16%
40	254.30	259.48	249.48	86.20	398.06	23.19%
45	244.89	250.66	239.49	92.44	490.50	28.57%
50	234.13	240.36	228.40	96.80	587.30	34.21%
55	222.26	228.64	216.33	99.25	686.55	39.99%
60	209.43	215.92	203.47	99.79	786.34	45.80%
65	195.89	202.09	190.10	98.54	884.87	51.54%
70	181.89	187.76	176.41	95.65	980.52	57.11%
75	167.68	173.08	162.61	91.37	1071.89	62.43%
80	153.58	158.43	149.03	85.94	1157.83	67.44%
85	139.79	144.10	135.75	79.69	1237.52	72.08%
90	126.49	130.28	122.90	72.88	1310.41	76.33%
95	113.86	117.12	110.72	65.78	1376.18	80.16%
100	101.97	104.79	99.27	58.62	1434.80	83.57%
105	90.90	93.31	88.58	51.58	1486.38	86.58%
110	80.67	82.71	78.66	44.82	1531.20	89.19%
115	71.28	73.06	69.55	38.46	1569.66	91.43%
120	62.67	64.23	61.18	32.55	1602.21	93.32%
125	54.83	56.15	53.54	27.15	1629.35	94.90%
130	47.71	48.87	46.58	22.29	1651.64	96.20%
135	41.24	42.24	40.26	17.97	1669.61	97.25%
140	35.40	36.28	34.56	14.19	1683.80	98.07%
145	30.15	30.91	29.41	10.94	1694.73	98.71%
150	25.47	26.11	24.83	8.19	1702.93	99.19%
155	21.31	21.83	20.78	5.92	1708.85	99.53%
160	17.36	17.80	16.95	4.07	1712.92	99.77%
165	13.03	13.61	12.58	2.53	1715.45	99.92%
170	6.37	7.68	6.01	1.23	1716.68	99.99%
175	0.08	0.02	0.02	0.18	1716.86	100.00%
180	0.00	0.00	0.00	0.00	1716.86	100.00%

LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

Individual Lamp Data- Sphere

Position	Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	PF	Luminous Lumens (lm)	LPW (lm/W)	CCX	CCY	CCT (K)	CRI	R9	Duv	Rf	Rg
VBU	1	120.02	0.202	13.2	0.546	1681.0	127.1	0.3788	0.3712	4003	85.3	18.5	-0.0021	85	96
	2	120.02	0.201	13.1	0.545	1664.6	126.8	0.3790	0.3713	4001	85.1	18.0	-0.0022	85	96
	3	120.03	0.198	13.0	0.548	1660.0	127.7	0.3791	0.3711	3996	85.1	18.2	-0.0023	85	96
	4	120.03	0.201	13.2	0.546	1658.1	126.0	0.3783	0.3716	4019	85.2	18.4	-0.0018	85	96
	5	120.03	0.201	13.2	0.546	1673.5	126.8	0.3788	0.3706	4000	85.3	18.8	-0.0024	85	96
VBD	7	120.04	0.192	13.0	0.564	1681.1	129.5	0.3783	0.3708	4014	85.4	19.0	-0.0022	85	96
	8	120.03	0.198	13.1	0.551	1678.8	128.1	0.3787	0.3710	4003	85.3	18.8	-0.0022	85	96
	9	120.04	0.201	13.3	0.551	1687.1	127.1	0.3776	0.3705	4031	85.5	19.6	-0.0021	85	96
	10	120.03	0.193	13.3	0.571	1690.3	127.5	0.3784	0.3709	4012	85.1	18.2	-0.0022	85	96
	11	120.03	0.193	13.2	0.570	1682.4	127.7	0.3774	0.3703	4035	85.3	18.9	-0.0022	85	96
Average		**120.03**	**0.198**	**13.2**	**0.554**	**1675.7**	**127.4**	**0.3784**	**0.3709**	**4011**	**85.3**	**18.6**	**-0.0022**	**85**	**96**

Individual Lamp Data- Goniometer

Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	Total Lumens (lm)	Beam Angle （°）	CBCP （cd）	90 cone lumen(lm)	E*Δu'v'
1	119.98	0.204	13.3	1716.9	167.2	287	490.5	---

LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

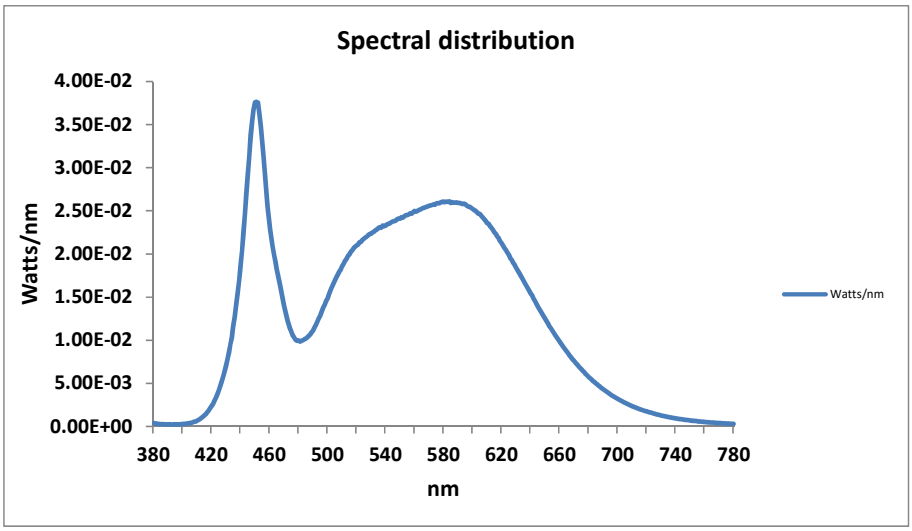
Test data in 5000K

Average Sphere Spectroradiometry Test Data

Lamp Volts(V)	Lamp Current(A)	Lamp Watts(W)	Power Factor	Lumens (lm)	LPW (lm/W)
120.01	0.189	12.4	0.549	1599.9	128.7

CCX	CCY	u′	v′	Duv	CCT(K)	CRI	R9	Rf	Rg
0.3498	0.3604	0.2112	0.4896	0.0025	4859	82.6	8.1	83	95

Spectral Power Distribution



nm	Watts/nm
380	3.96E-04
385	2.87E-04
390	2.44E-04
395	2.44E-04
400	2.87E-04
405	3.99E-04
410	6.60E-04
415	1.27E-03
420	2.37E-03
425	4.22E-03
430	7.06E-03
435	1.16E-02
440	1.87E-02
445	2.92E-02
450	3.76E-02
455	3.31E-02
460	2.33E-02

nm	Watts/nm
465	1.82E-02
470	1.41E-02
475	1.10E-02
480	9.96E-03
485	1.02E-02
490	1.11E-02
495	1.29E-02
500	1.49E-02
505	1.69E-02
510	1.86E-02
515	1.99E-02
520	2.10E-02
525	2.18E-02
530	2.23E-02
535	2.30E-02
540	2.33E-02
545	2.38E-02

nm	Watts/nm
550	2.41E-02
555	2.45E-02
560	2.50E-02
565	2.53E-02
570	2.56E-02
575	2.59E-02
580	2.61E-02
585	2.59E-02
590	2.59E-02
595	2.58E-02
600	2.52E-02
605	2.47E-02
610	2.36E-02
615	2.25E-02
620	2.13E-02
625	1.99E-02
630	1.84E-02

nm	Watts/nm
635	1.69E-02
640	1.54E-02
645	1.39E-02
650	1.25E-02
655	1.11E-02
660	9.85E-03
665	8.69E-03
670	7.61E-03
675	6.63E-03
680	5.77E-03
685	5.00E-03
690	4.34E-03
695	3.74E-03
700	3.21E-03
705	2.76E-03
710	2.37E-03
715	2.04E-03

nm	Watts/nm
720	1.75E-03
725	1.50E-03
730	1.29E-03
735	1.11E-03
740	9.56E-04
745	8.22E-04
750	7.11E-04
755	6.12E-04
760	5.31E-04
765	4.58E-04
770	4.00E-04
775	3.49E-04
780	3.25E-04

LM-79 Test Report

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No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

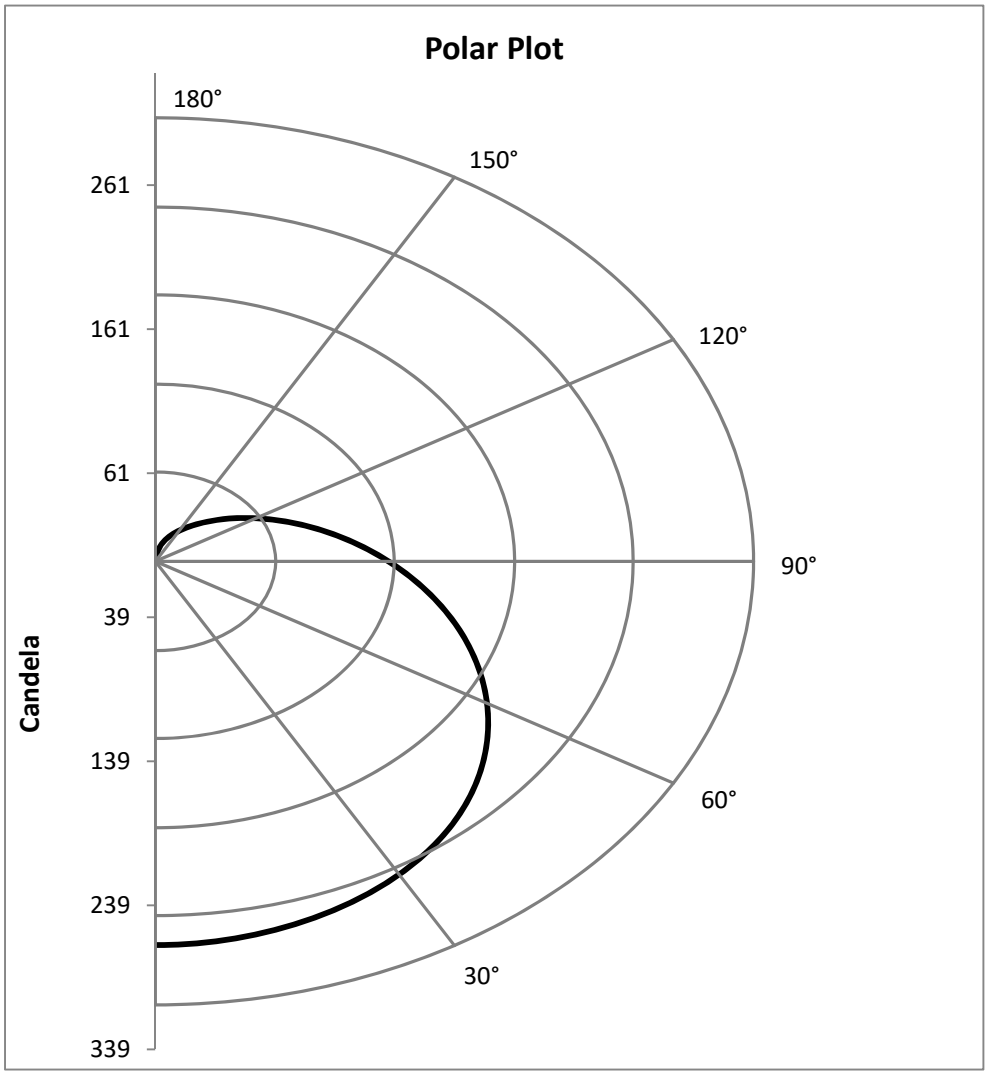
Test Request Number: BG-NW250110-4-01

Average Goniometry Test Data

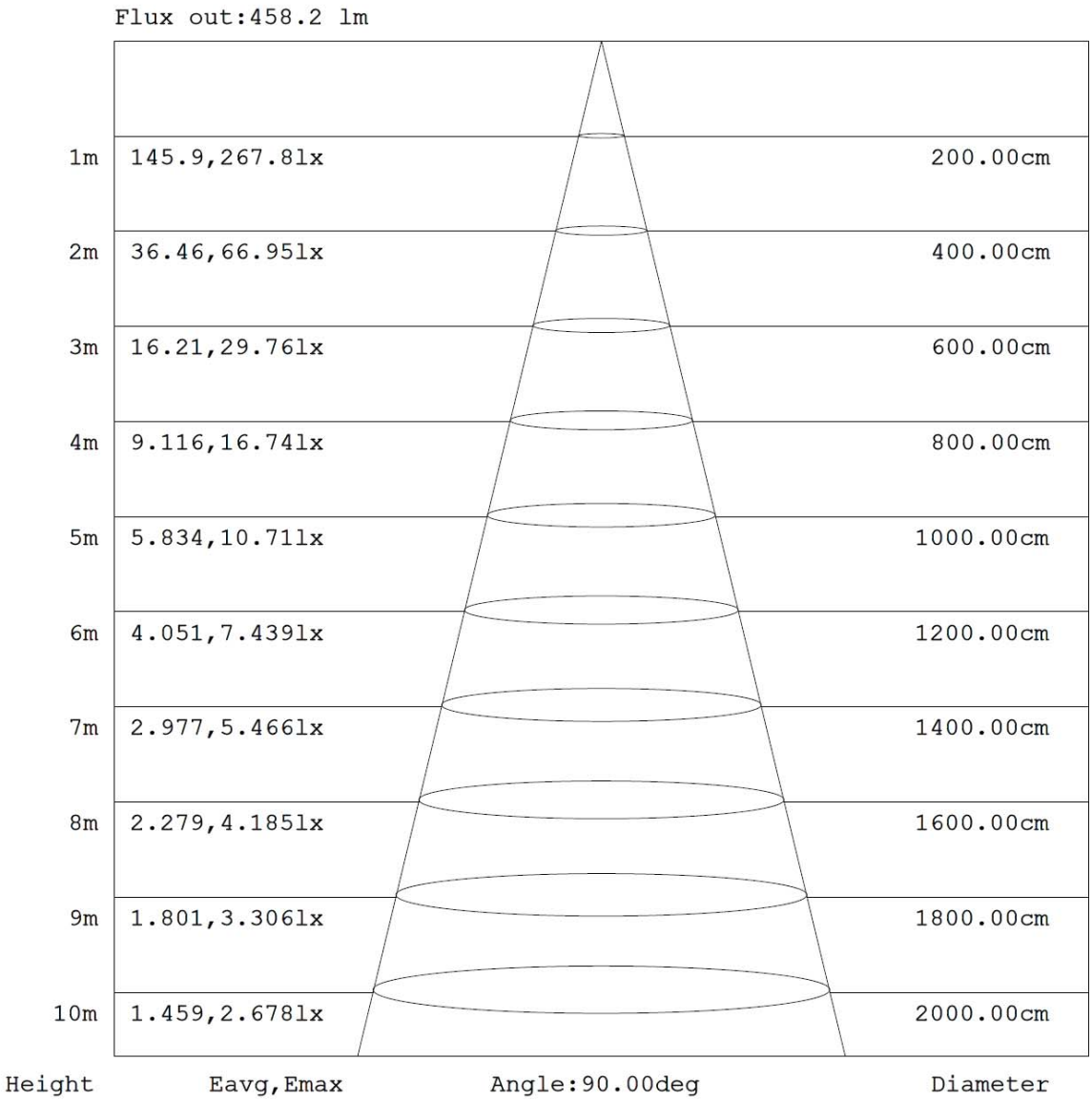
Beam Angle				Color Distribution
	Candela	Half Angle	Full Angle	Δu'v'
Max	268	1.0	-----	-----
50%of Max	134	84.4	168.9	-----
10%of Max	27	-----	-----	-----

Volts	Amps	Watts	PF
120.00	0.199	12.9	0.539
Total Downlight Lumens:			1231.6
Total Uplight Lumens:			387.6
Total Lumens:			1619.2
Total Lumens/ Watt:			125.6

Intensity Distribution

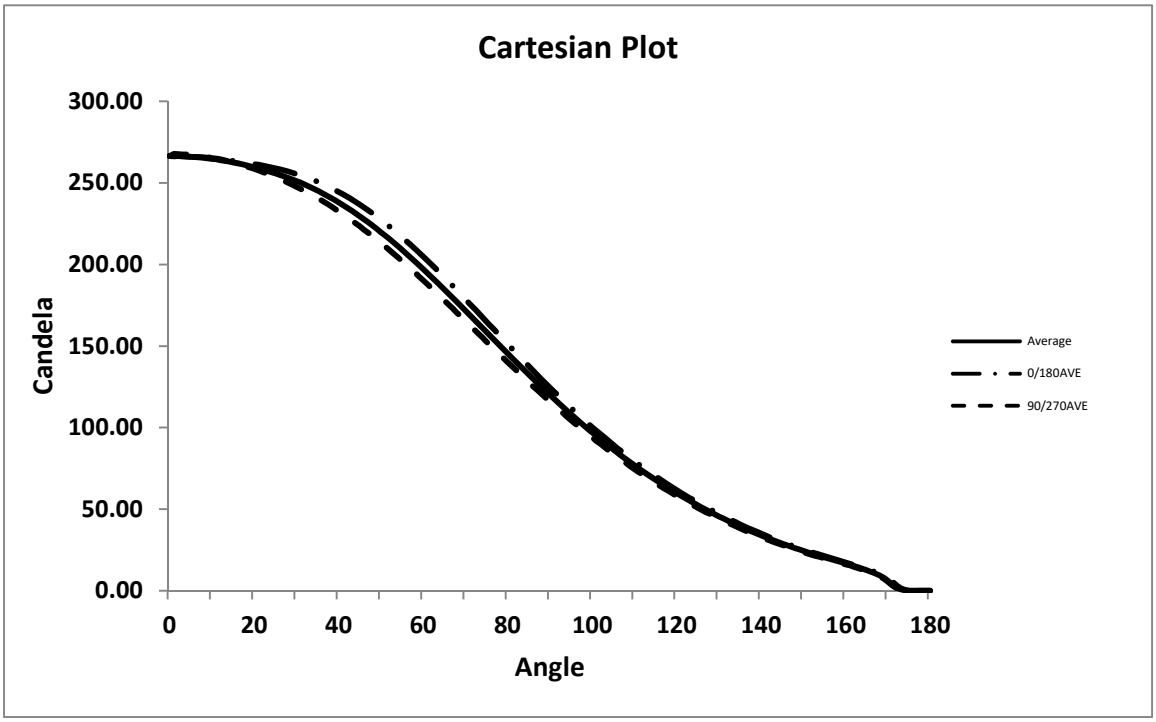


Cone Diagram



Note:The Curves indicate the illuminated area and the average illumination when the luminaire is at different distance.

Cartesian Plot



LM-79 Test Report

Testing Laboratory of Xiamen Topstar Lighting Co., Ltd.
No.676 Meixi Avenue, Xike, Tong'an District, Xiamen, Fujian, China

Test Request Number: BG-NW250110-4-01

Cartesian Distribution

Angle	Average cd	0/180 Average	90/270 Average	Zonal Lumens	Cumulative Lumens	%Total
0	266.42	266.42	266.42	0.00	0.00	0.00%
5	266.00	266.03	267.06	6.37	6.37	0.39%
10	264.72	265.13	265.33	18.99	25.35	1.57%
15	262.57	263.56	262.55	31.28	56.63	3.50%
20	259.57	261.51	258.58	43.03	99.66	6.15%
25	255.76	258.96	253.59	54.05	153.70	9.49%
30	251.09	255.51	247.65	64.15	217.85	13.45%
35	245.26	250.75	240.65	73.11	290.96	17.97%
40	238.08	244.52	232.56	80.65	371.61	22.95%
45	229.57	236.79	223.37	86.61	458.21	28.30%
50	219.82	227.40	213.16	90.82	549.03	33.91%
55	208.98	216.77	202.06	93.25	642.28	39.67%
60	197.22	204.88	190.31	93.89	736.17	45.46%
65	184.74	192.14	178.00	92.85	829.02	51.20%
70	171.76	178.70	165.42	90.26	919.28	56.77%
75	158.55	164.93	152.73	86.34	1005.62	62.11%
80	145.45	151.17	140.19	81.33	1086.95	67.13%
85	132.55	137.67	127.87	75.51	1162.46	71.79%
90	120.08	124.50	116.00	69.14	1231.61	76.06%
95	108.21	112.10	104.66	62.48	1294.09	79.92%
100	97.02	100.36	93.92	55.74	1349.83	83.36%
105	86.60	89.46	83.93	49.11	1398.94	86.40%
110	76.92	79.39	74.61	42.72	1441.65	89.03%
115	68.02	70.18	66.03	36.68	1478.34	91.30%
120	59.85	61.72	58.13	31.07	1509.41	93.22%
125	52.41	54.05	50.89	25.94	1535.34	94.82%
130	45.64	47.08	44.31	21.31	1556.65	96.14%
135	39.47	40.75	38.34	17.19	1573.85	97.20%
140	33.91	35.03	32.90	13.58	1587.43	98.04%
145	28.93	29.90	28.03	10.49	1597.92	98.69%
150	24.47	25.32	23.68	7.87	1605.78	99.17%
155	20.51	21.19	19.86	5.70	1611.48	99.52%
160	16.74	17.31	16.23	3.92	1615.40	99.77%
165	12.59	13.26	12.03	2.44	1617.84	99.92%
170	6.19	7.67	5.57	1.19	1619.03	99.99%
175	0.02	0.02	0.02	0.17	1619.20	100.00%
180	0.00	0.00	0.00	0.00	1619.20	100.00%

LM-79 Test Report

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Individual Lamp Data- Sphere

Position	Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	PF	Luminous Lumens (lm)	LPW (lm/W)	CCX	CCY	CCT (K)	CRI	R9	Duv	Rf	Rg
VBU	1	120.00	0.192	12.6	0.547	1641.2	130.0	0.3508	0.3614	4826	82.6	8.0	0.0026	83	95
	2	120.00	0.192	12.6	0.546	1615.7	128.3	0.3504	0.3608	4840	82.5	7.5	0.0025	83	95
	3	120.00	0.189	12.4	0.548	1600.9	129.0	0.3498	0.3603	4860	82.4	7.4	0.0025	83	96
	4	120.00	0.193	12.6	0.546	1610.5	127.6	0.3496	0.3613	4872	82.6	7.5	0.0030	84	95
	5	120.00	0.194	12.7	0.545	1600.4	126.0	0.3493	0.3588	4872	83.0	9.3	0.0019	84	95
VBD	7	120.01	0.181	12.4	0.570	1602.4	129.5	0.3491	0.3596	4881	82.7	8.5	0.0024	83	95
	8	120.01	0.184	12.1	0.548	1582.9	130.8	0.3509	0.3614	4826	82.6	8.0	0.0026	83	95
	9	120.01	0.188	12.3	0.547	1587.7	128.7	0.3496	0.3606	4870	82.9	8.7	0.0027	84	95
	10	120.02	0.187	12.3	0.545	1585.7	129.4	0.3501	0.3605	4847	82.4	7.4	0.0025	83	96
	11	120.02	0.188	12.3	0.548	1571.4	127.3	0.3485	0.3590	4900	82.7	8.5	0.0023	83	95
Average		**120.01**	**0.189**	**12.4**	**0.549**	**1599.9**	**128.7**	**0.3498**	**0.3604**	**4859**	**82.6**	**8.1**	**0.0025**	**83**	**95**

Individual Lamp Data- Goniometer

Sample No.	Lamp Volts (V)	Lamp Current (A)	Lamp Watts (W)	Total Lumens (lm)	Beam Angle （°）	CBCP （cd）	90 cone lumen(lm)	E*Δu'v'
1	120.00	0.199	12.9	1619.2	168.9	268	458.2	---

(The End of Report)