

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2014

Prepared For

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2018/11/22

Issue Date

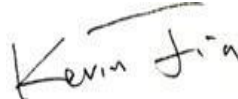
2018/11/23

Prepared By



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Approved By



Kevin Jia

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1.0 Test Summary

DLC Technical Requirements v4.4

Outdoor - High output Outdoor Pole/Arm-Mounted Area and Roadway Luminaires			
Requirement Category	Test Method	Requirements	Test value
Lamp Output (lm)	IES LM-79-2008	10000	12495
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	106.9
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	≤10%	3.25%
Allowable CCTs* (K)	IES LM-79-2008	≤5700	3090
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	≥65	81.5
Power Factor	ANSI C82.77:2014	0.873	0.936
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	5.97%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/22	IVAT5S-130L730[H, 4]	Y1
2	Goniophotometer Test	2018/11/22	IVAT5S-130L730[H, 4]	Y1
3	THD and PF Test	2018/11/22	IVAT5S-130L730[H, 4]	Y1

Remark(If any)

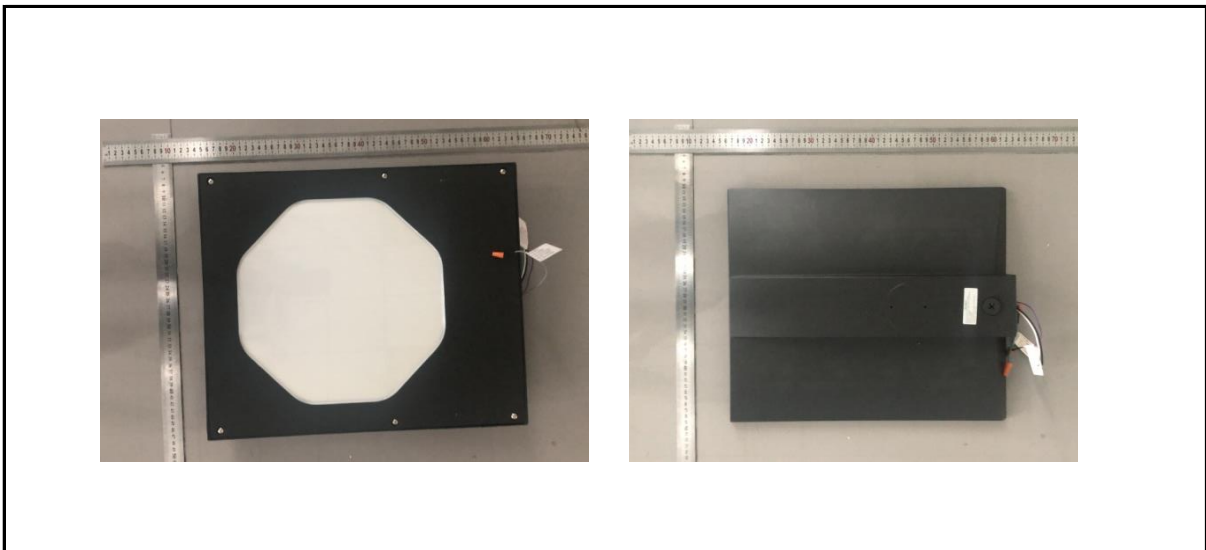
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3.0 Production Description

Luminaire Description: IVAT5S-130L730[H, 4]

Electrical Specification: 480V,50/60HZ, 130W

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVAT5S-130L730[H, 4]	Sample ID.	Y1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

The sample measurements were made using a spectroradiometer connected by a fiber optic cable and detector through the detector port of the integrating sphere.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The sample was measured using 4π geometry and 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.

Test Conditions

Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.3	479.98	60	0.262	117.1	0.936

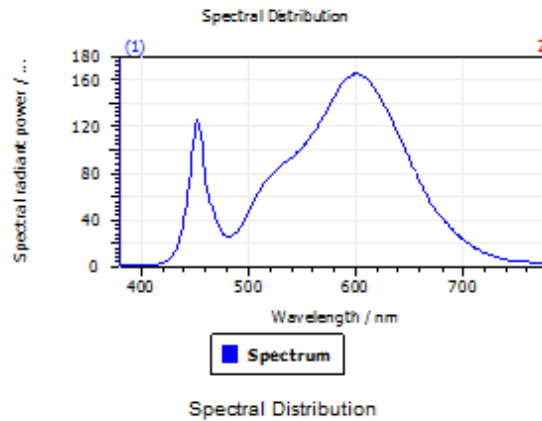
Test Result

CCT (K)	CRI (Ra)	Duv
3090	81.5	3.3E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results

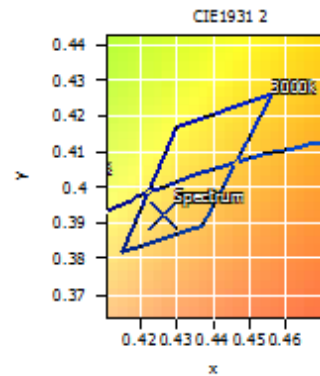


Spectral values

DominantWavelength	583.75 nm
Purity	0.457
PeakWavelength	601.10 nm
Width50%	129.45 nm

Color Coordinates

Correlated Color Temperature		3090 K
x: 0.4262	u: 0.2487	u': 0.2487
y: 0.3922	v: 0.3433	v': 0.5150
CRI01	80.2	CRI09
CRI02	89.8	CRI10
CRI03	95.6	CRI11
CRI04	79.4	CRI12
CRI05	80.3	CRI13
CRI06	86.8	CRI14
CRI07	81.9	CRI15
CRI08	58.2	CRI16
ResultsCRI	81.5	



PlanckDistance 3.3E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT5S-130L730[H, 4]	Sample ID.	Y1
Operate time (Min.)	90	Stabilization time (Min.)	45

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric parameters were measured using a type C goniophotometer and software.

The ambient temperature shall be maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$, measured at a point not more than 1 m from the sample and at the same height as the sample.

The voltage of an AC power supply (RMS voltage) or DC power supply (instantaneous voltage) applied to the device under test shall be regulated to within ± 0.2 percent under load.

The samples were operated at rated voltage and was stabilized before measurement. Luminous flux, luminaire efficacy, zonal lumen were calculated from the software taken at 0.5° vertical intervals and 10° horizontal intervals.

Test Conditions

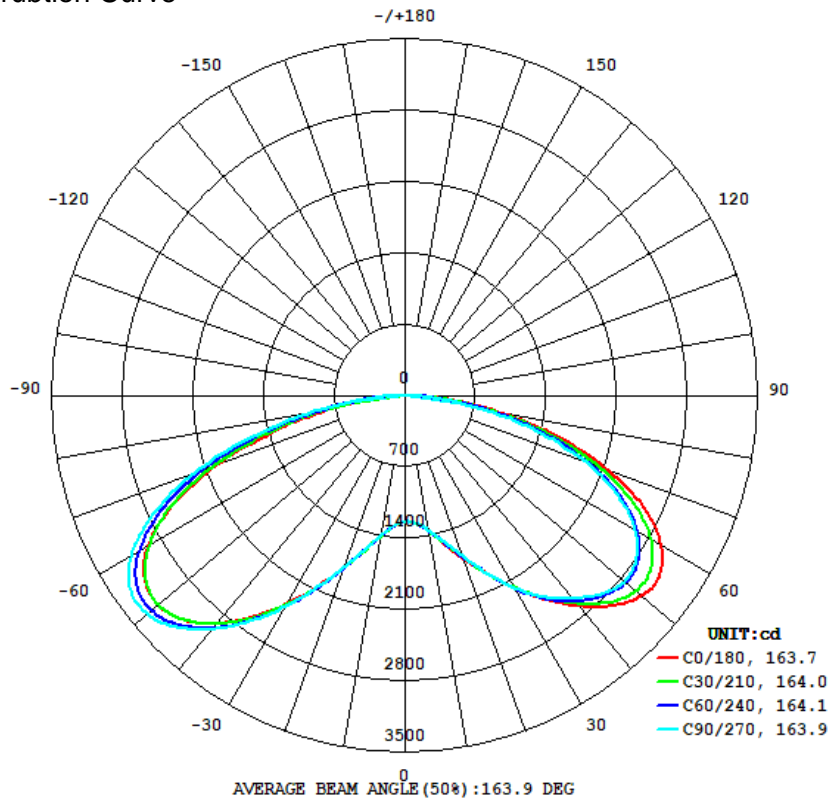
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	480.05	60	0.260	116.9	0.936	Light Down

Test Result

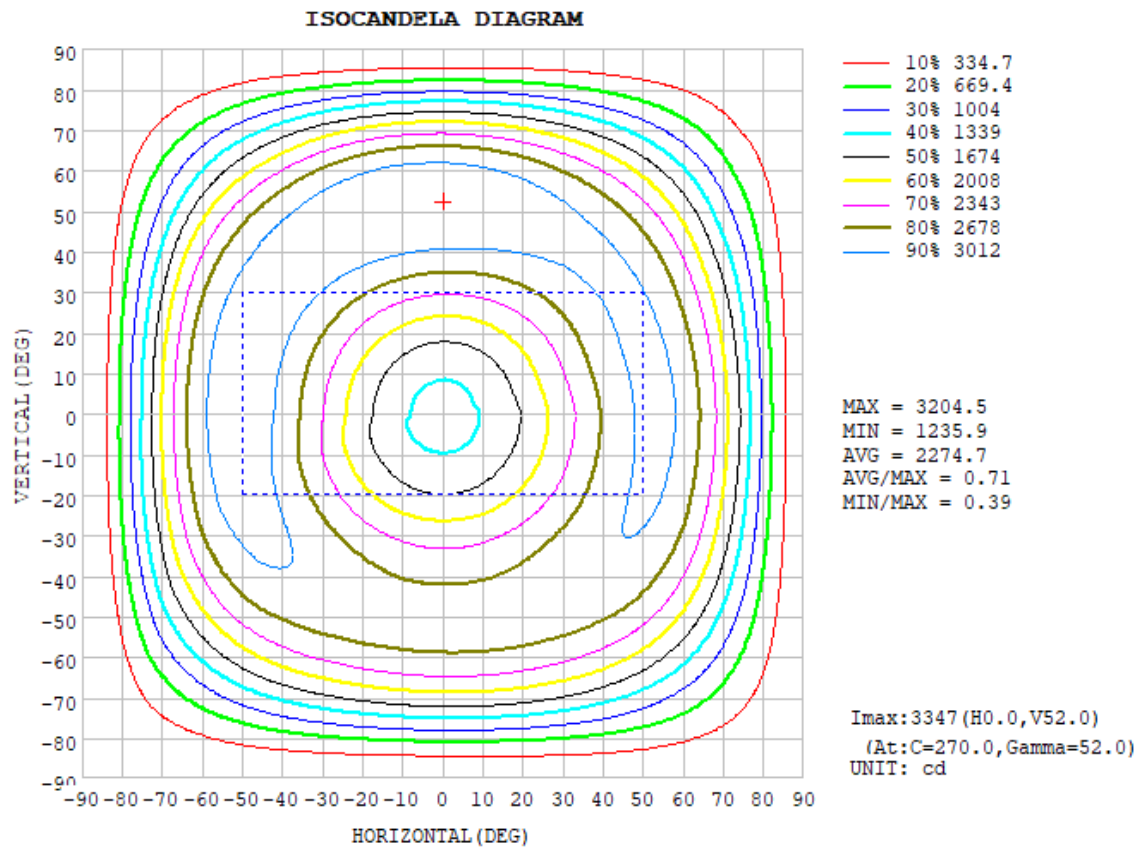
Flux (lm)	Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
12495	100.00%	3.25%	175.2	175.6	163.7	163.9	106.9

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1351	1346	1341	1350	1396	1394	1386	1384
20	1696	1684	1674	1698	1796	1803	1794	1765
30	2182	2171	2181	2210	2357	2377	2387	2292
40	2696	2667	2598	2728	2918	2940	2991	2802
50	3060	2899	2837	2960	3195	3215	3334	3082
60	2934	2718	2640	2721	2942	2956	3130	2881
70	2153	1983	1909	1955	1995	2039	2229	2059
80	943.0	880.7	786.5	824.2	736.3	830.5	918.9	863.3
90	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0
DEG	LUMINOUS INTENSITY:cd							

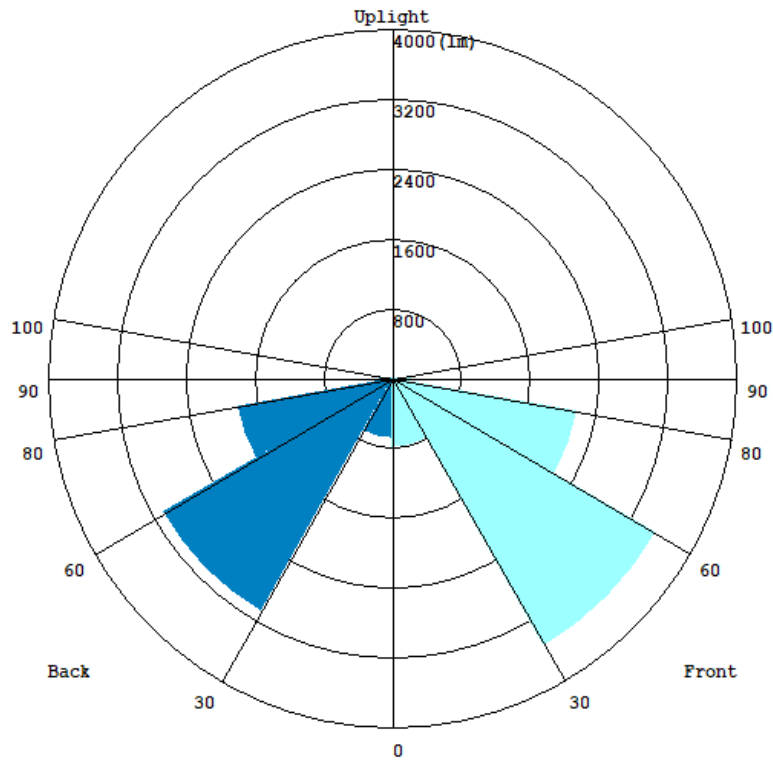
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	124.39	0 - 10	124.39	1.00%
10-20	440.77	0 - 20	565.16	4.52%
20-30	930.87	0 - 30	1496.03	11.97%
30-40	1599.27	0 - 40	3095.30	24.77%
40-50	2290.99	0 - 50	5386.29	43.11%
50-60	2698.65	0 - 60	8084.94	64.71%
60-70	2470.51	0 - 70	10555.45	84.48%
70-80	1532.83	0 - 80	12088.28	96.75%
80-90	406.40	0 - 90	12494.68	100.00%
90-100	0.00	0 - 100	12494.68	100.00%
100-110	0.00	0 - 110	12494.68	100.00%
110-120	0.00	0 - 120	12494.68	100.00%
120-130	0.00	0 - 130	12494.68	100.00%
130-140	0.00	0 - 140	12494.68	100.00%
140-150	0.00	0 - 150	12494.68	100.00%
150-160	0.00	0 - 160	12494.68	100.00%
160-170	0.00	0 - 170	12494.68	100.00%
170-180	0.00	0 - 180	12494.68	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	804.2	6.4
FM - Front-Medium(30-60)	3536.7	28.3
FH - Front-High(60-80)	2185.3	17.5
FVH - Front-Very High(80-90)	225.77	1.8
Total Forward Light	6751.9	53.9

BL - Back-Low(0-30)	693.17	5.5
BM - Back-Medium(30-60)	3072.9	24.6
BH - Back-High(60-80)	1830.1	14.6
BVH - Back-Very High(80-90)	168.63	1.3
Total Back Light	5764.7	46.1

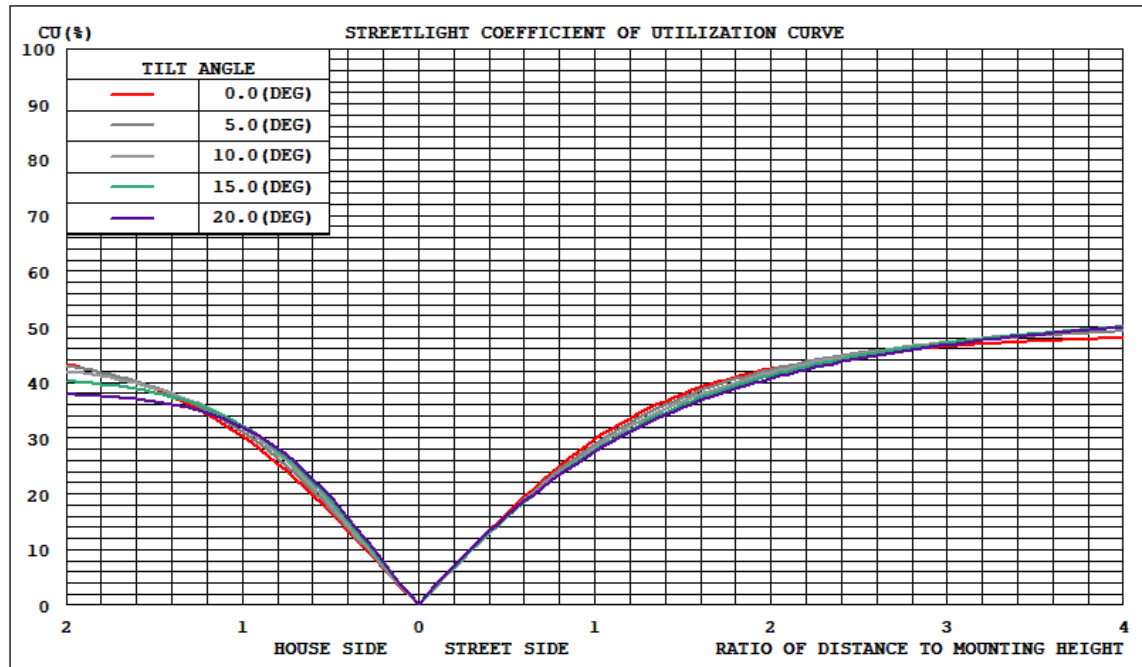
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G2
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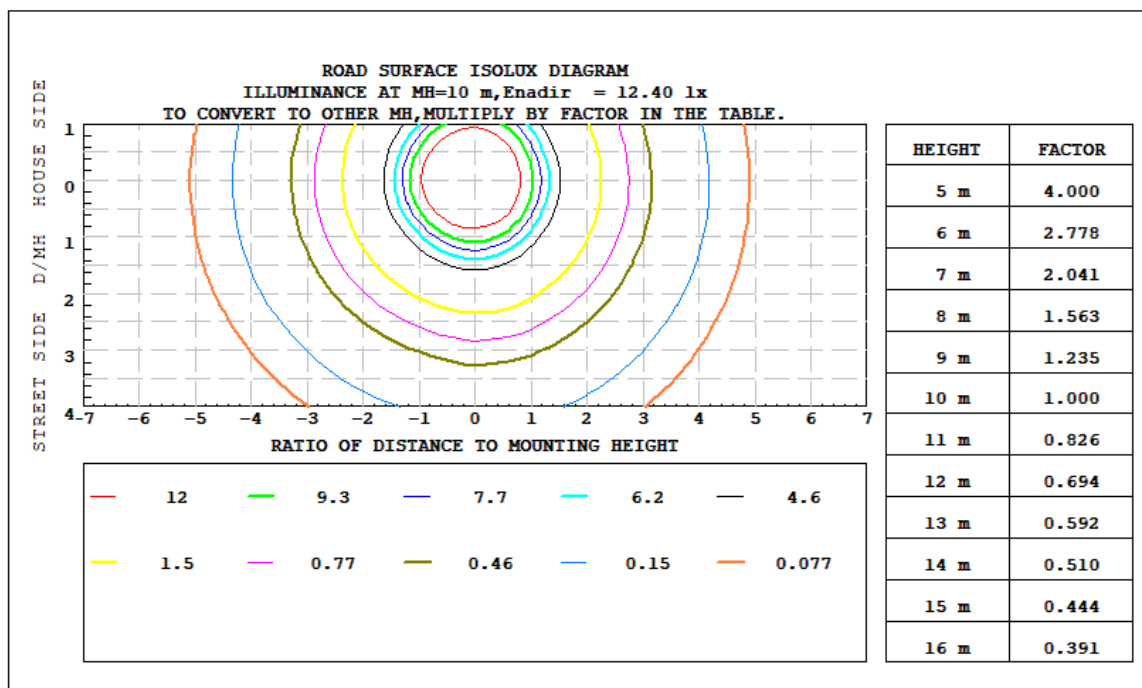
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	5764.7	0	5764.7
Street Side	6751.9	0	6751.9

3.2 Goniophotometer Test

Coefficients of Utilization

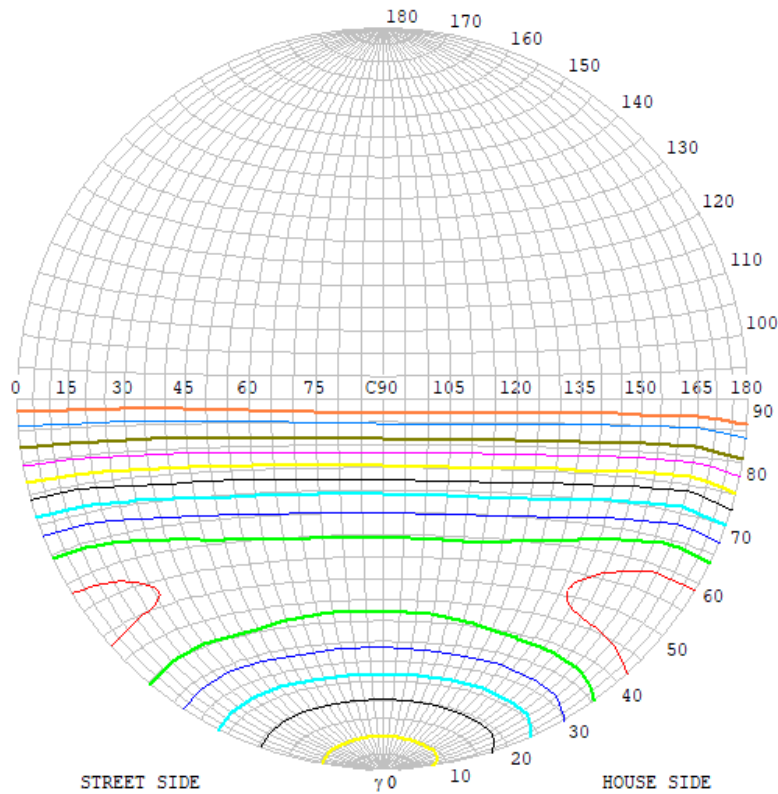


Iso-footcandle Lines of Horizontal Illumination



3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM

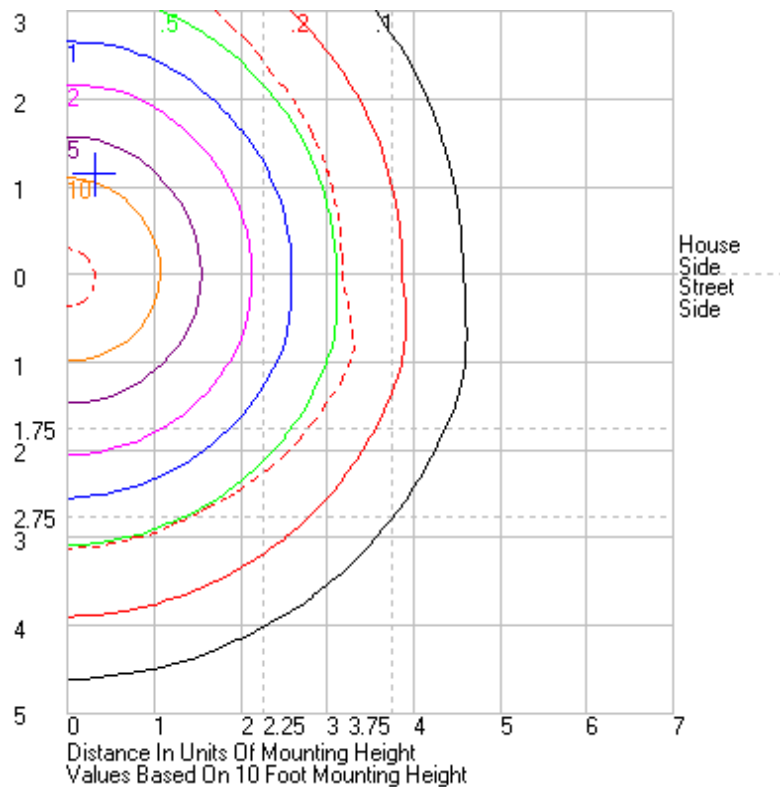


Classification:

IES:Type V - Very Short
CIE:Broad - Short
IES:Full cut-off
CIE:Semi-cut-off
Max.At80:75.34cd/klm
Max.At90:0cd/klm
Max.80-90:75.34cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	3347
90%	3013
80%	2678
70%	2343
60%	2008
50%	1674
40%	1339
30%	1004
20%	669
10%	335
5%	167

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT5S-130L730[H, 4]	Sample ID.	Y1
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Test Method

The samples were tested according to the ANSI C82.77:2002.

The total harmonic distortion shall be measured to the 40th order.

The ambient temperature condition was maintained at $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. The sample measurements were made using a digital power meter and power supply. The sample was operated at rated voltage and was stabilized before measurement. The total harmonic distortion were calculated.

Test Results

Temperature (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
25.1	479.98	60	0.262	117.1	0.936	5.97%

6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration	Calibration Due Date
DLF107	Integrating Sphere System	2017/12/28	2018/12/27
DLF108	Auxiliary Lamp	2017/12/28	2018/12/27
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-directional	2017/12/28	2018/12/27
DLF116	AC Power Source	2017/12/28	2018/12/27
DLF113	Power Meter	2017/12/28	2018/12/27
DLF112	Temperature Recorder	2017/12/28	2018/12/27
DLF114	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF101	Goniophotometer	2017/12/28	2018/12/27
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-directional	2017/12/28	2018/12/27
DLF104	AC Power Source	2017/12/28	2018/12/27
DLF507	DC Power Source	2017/12/28	2018/12/27
DLF102	Power Meter	2017/12/28	2018/12/27
DLF111	Temperature & Humidity Datalogger	2017/12/28	2018/12/27
DLF119	Power Meter	2017/12/28	2018/12/27
DLF031	Temperature data logger	2017/12/28	2018/12/27
DLF022	Digital power meter	2017/12/28	2018/12/27
DLF003	Temperature & Humidity Datalogger	2017/12/28	2018/12/27

***** End of Test Report*****