Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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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	15212
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	120	130.1
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	⩾99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	⩽10%	2.86%
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	4871
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	74.4
Power Factor	ANSI C82.77:2014	0.873	0.935
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	6.30%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/22	IVAT4-130L730[H, 4]	T1
2	Goniophotometer Test	2018/11/22	IVAT4-130L730[H, 4]	T1
3	THD and PF Test	2018/11/22	IVAT4-130L730[H, 4]	T1

Remark(If any)
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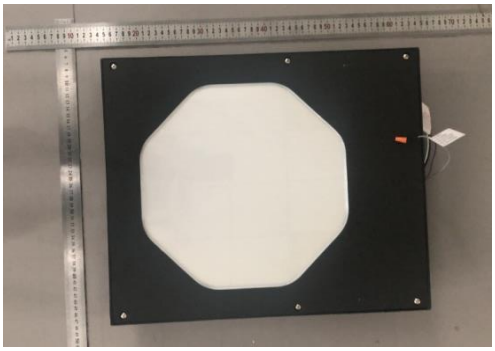
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing period only and are not to be used to indicate applicability to other similar products. This report does not imply that the product(s) has met the criteria for certification.

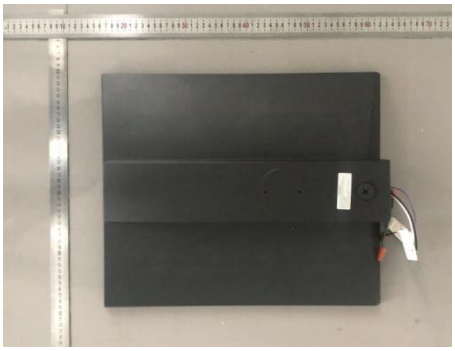
3.0 Production Description

Luminaire Description: IVAT4-130L730[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.	IVAT4-130L730[H, 4]	Sample ID.	T1
Opreate time (Min.)	90	Stabilization time (Min.)	45

Test Method
The samples were tested according to the IES LM-79-2008. Photometric paramters were measured using an integrating sphere, a spectroradiometer and software. The ambient temperature condition inside the sphere was maintained at 25º C ± 1º 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 (°C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
25.3	480.03	60	0.261	117.4	0.935

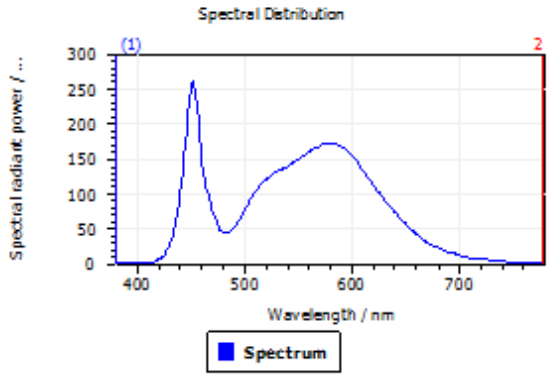
Test Result

CCT (K)	CRI (Ra)	Duv
4871	74.4	4.4E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



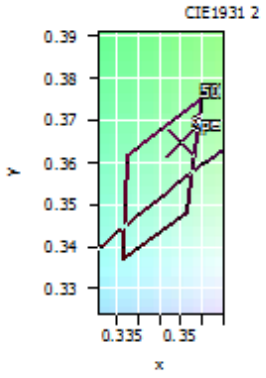
Spectral Distribution

Spectral values

DominantWavelength	570.72 nm
Purity	0.144
PeakWavelength	451.37 nm
Width50%:	19.57 nm

Color Coordinates

Correlated Color Temperatu		4871 K			
x:	0.3500	u:	0.2098	u':	0.2098
y:	0.3645	v:	0.3277	v':	0.4915
CRI01		70.0	CRI09		-35.2
CRI02		81.4	CRI10		56.6
CRI03		90.0	CRI11		69.2
CRI04		72.4	CRI12		43.7
CRI05		71.2	CRI13		72.6
CRI06		74.3	CRI14		94.7
CRI07		82.9	CRI15		61.9
CRI08		53.3	CRI16		60.4
ResultsCRI		74.4			



PlanckDistance 4.4E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT4-130L730[H, 4]	Sample ID.	T1
Opreate time (Min.)	90	Stabilization time (Min.	45

Test Method
The samples were tested according to the IES LM-79-2008.
Photometric paramters were measured using a type C goniophotometer and software.
The ambient temperature shall be maintained at 25° C ± 1° 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^{o} vertical intervals and 10^{o} horizontal intervals.

Test Conditions

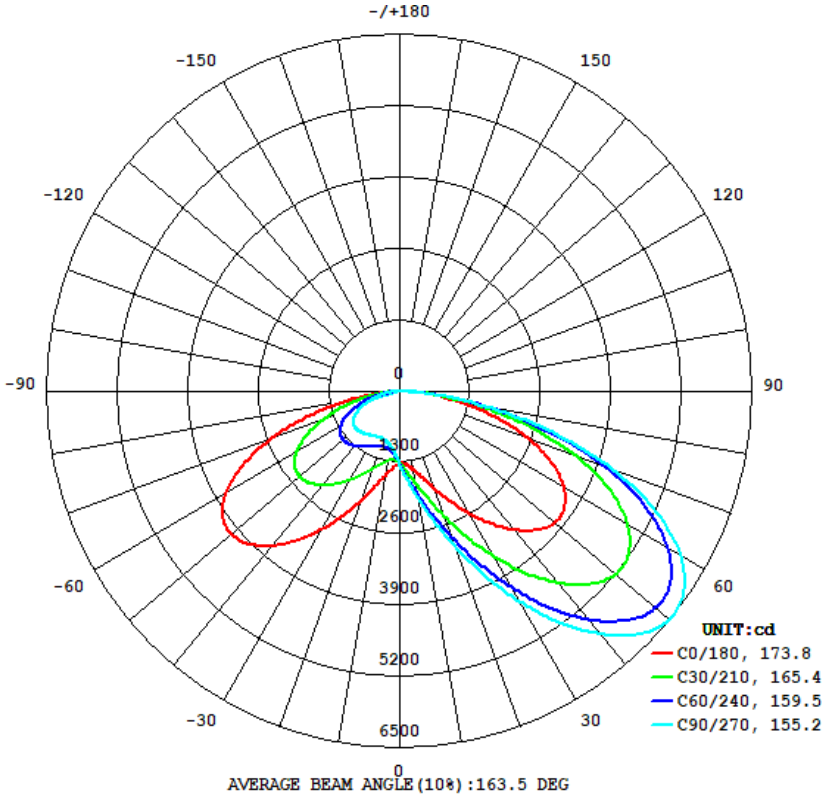
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	479.98	60	0.260	116.9	0.935	Light Down

Test Result

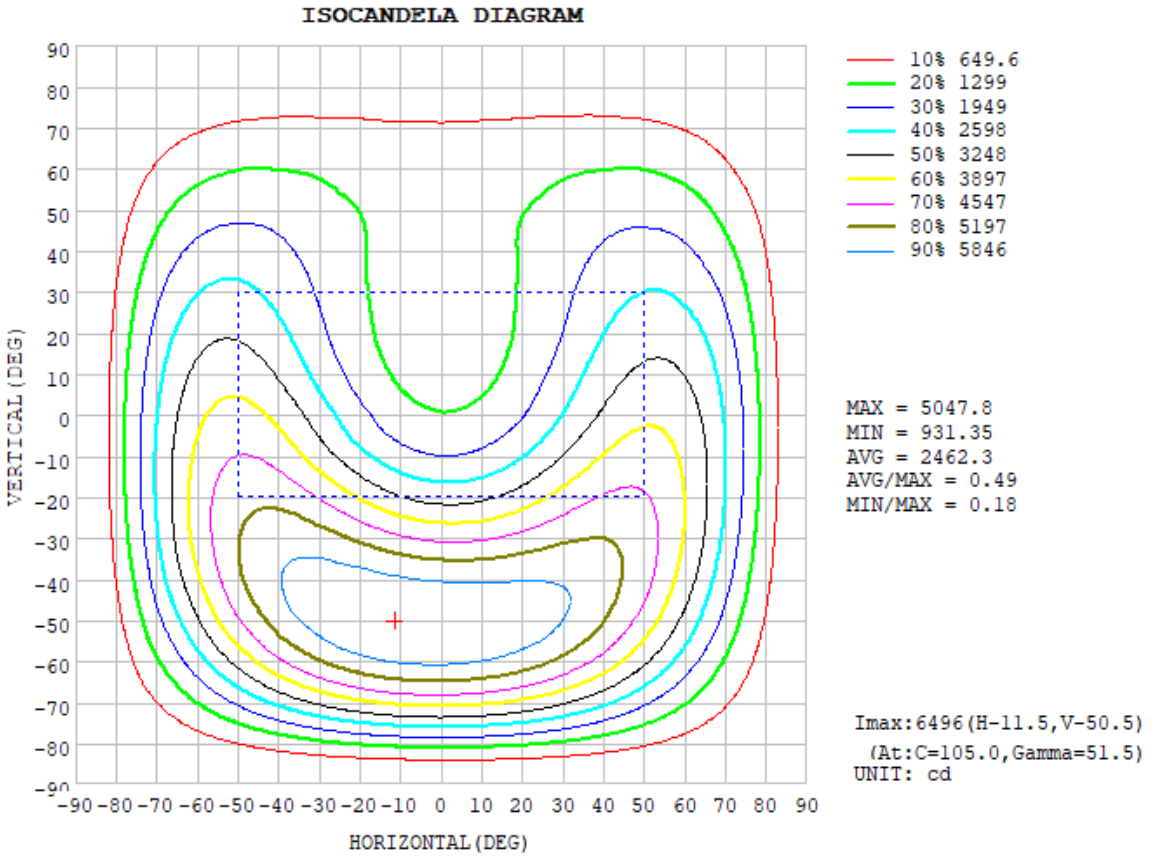
Flux (lm)	Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (80°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
15212	100.00%	2.86%	173.8	155.2	164.4	52.0	130.1

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

DEG	LUMINOUS INTENSITY:cd												
γ	C0	C45	C90	C135	C180	C225	C270	C315
10	1444	1790	1956	1857	1553	1183	1023	1143
20	1888	2652	3017	2828	2114	1266	935.1	1204
30	2578	3841	4417	4151	2908	1471	957.5	1406
40	3305	5069	5778	5448	3683	1696	1027	1639
50	3731	5750	6482	6111	4058	1798	1066	1759
60	3507	5367	5979	5635	3692	1626	971.8	1612
70	2531	3807	4174	3928	2519	1140	691.1	1151
80	1064	1524	1608	1491	908.4	445.3	281.5	469.7
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

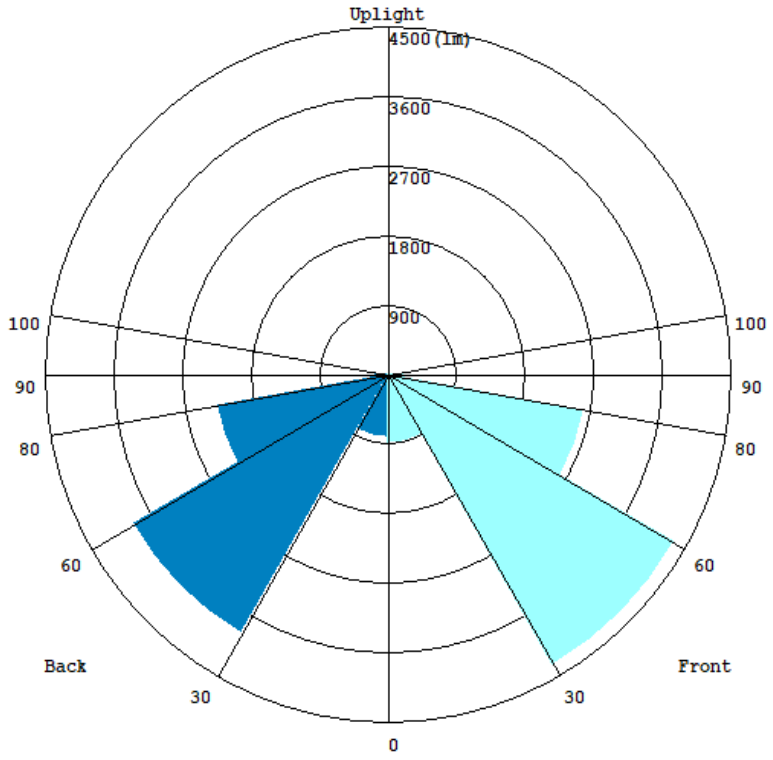
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	134.29	0 - 10	134.29	0.88%
10-20	493.87	0 - 20	628.16	4.13%
20-30	1092.17	0 - 30	1720.33	11.31%
30-40	1951.94	0 - 40	3672.27	24.14%
40-50	2859.24	0 - 50	6531.51	42.94%
50-60	3363.11	0 - 60	9894.62	65.04%
60-70	3040.41	0 - 70	12935.03	85.03%
70-80	1842.88	0 - 80	14777.91	97.14%
80-90	434.31	0 - 90	15212.22	100.00%
90-100	0.00	0 - 100	15212.22	100.00%
100-110	0.00	0 - 110	15212.22	100.00%
110-120	0.00	0 - 120	15212.22	100.00%
120-130	0.00	0 - 130	15212.22	100.00%
130-140	0.00	0 - 140	15212.22	100.00%
140-150	0.00	0 - 150	15212.22	100.00%
150-160	0.00	0 - 160	15212.22	100.00%
160-170	0.00	0 - 170	15212.22	100.00%
170-180	0.00	0 - 180	15212.22	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	909.35	6.0
FM - Front-Medium(30-60)	4333.4	28.5
FH - Front-High(60-80)	2624.2	17.2
FVH - Front-Very High(80-90)	224.22	1.5
Total Forward Light	8091.1	53.2

BL - Back-Low(0-30)	812.65	5.3
BM - Back-Medium(30-60)	3869.4	25.4
BH - Back-High(60-80)	2273.3	14.9
BVH - Back-Very High(80-90)	174.18	1.1
Total Back Light	7129.6	46.8

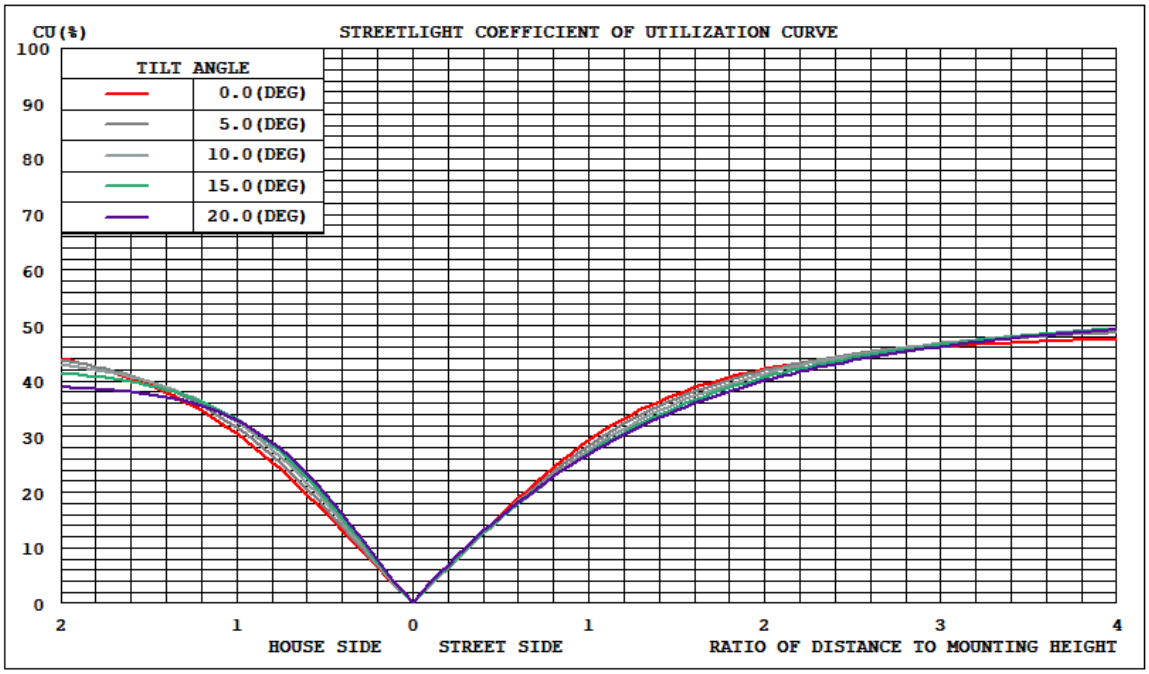
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

BUG(Back,Up,Glare) Rating	B3-U0-G3

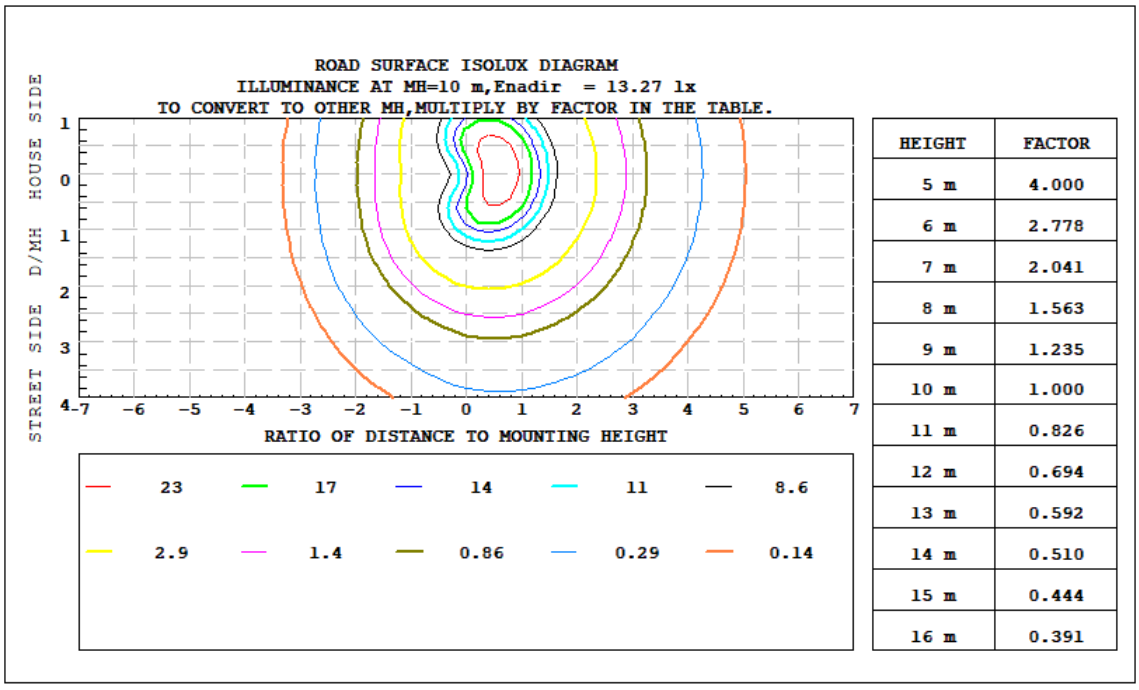
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	7129.6	0	7129.6
Street Side	8091.1	0	8091.1

3.2 Goniophotometer Test

Coefficients of Utilization



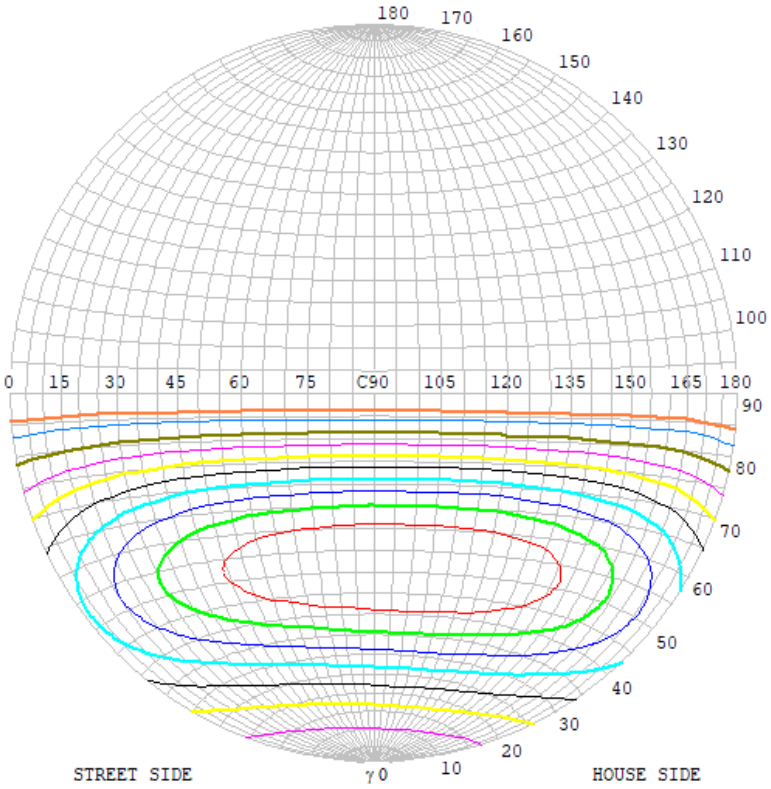
Iso-footcandle Lines of Horizontal Illumination



HEIGHT	FACTOR
5 m	4.000
6 m	2.778
7 m	2.041
8 m	1.563
9 m	1.235
10 m	1.000
11 m	0.826
12 m	0.694
13 m	0.592
14 m	0.510
15 m	0.444
16 m	0.391

3.2 Goniophotometer Test

STREETLIGHT ISOCANDELA DIAGRAM

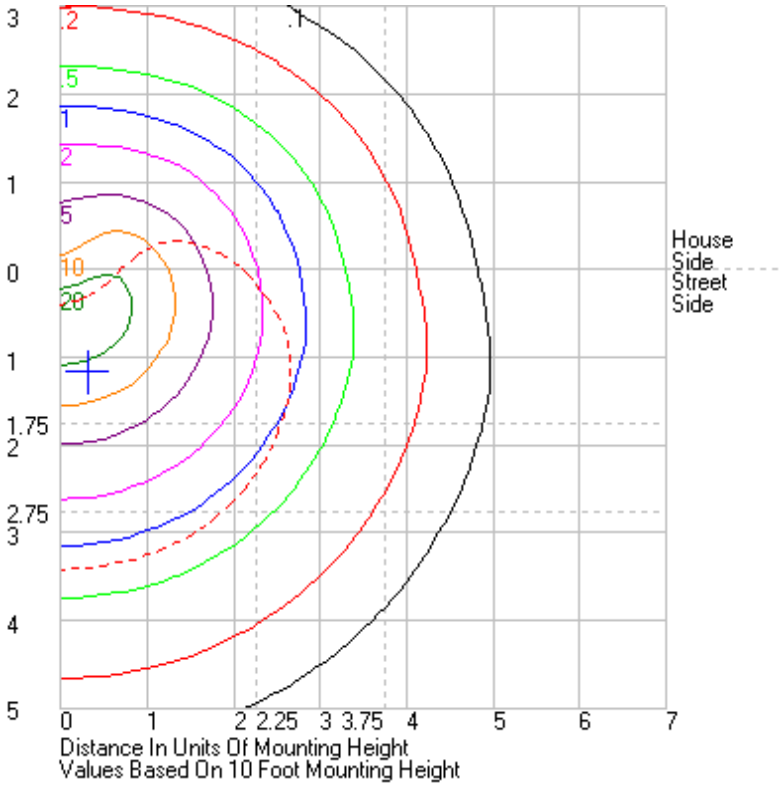


Classification:

IES:Type III - Very Short
CIE:Narrow - Short
IES:Semi cut-off
CIE:Non-cut-off
Max.At80:105.7cd/klm
Max.At90:0cd/klm
Max.80-90:105.7cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	6507
90%	5856
80%	5205
70%	4555
60%	3904
50%	3253
40%	2603
30%	1952
20%	1301
10%	651
5%	325

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT4-130L730[H, 4]	Sample ID.	T1

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 25º C ± 1º 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	480.03	60	0.261	117.4	0.935	6.30%

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-derectional	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-derectional	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**********