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 v4.3

Outdoor - Hight output Outdoor Pole/Arm-Mounted Area and Roadway Luminaires				
Requirement Category	**Test Method**	**Requirements**	**Test value**	**Results (Fail/Pass)**
Lamp Output (lm)	IES LM-79-2008	10000	10167	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	120	109.6	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	⩾99%	100.00%	P
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	⩽10%	3.07%	P
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	3056	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	80	P
Power Factor	ANSI C82.77:2014	0.873	0.964	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	8.79%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/24	IVAT2-100L730U	M1
2	Goniophotometer Test	2018/10/24	IVAT2-100L730U	M1
3	THD and PF Test	2018/10/24	IVAT2-100L730U	M1

Remark(If any)
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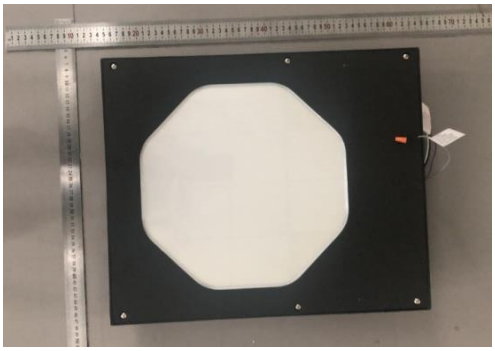
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing 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.

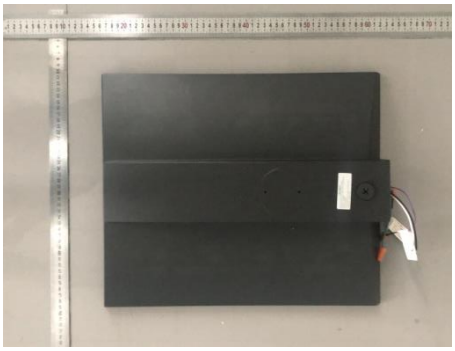
3.0 Production Description

Luminaire Description: IVAT2-100L730U

Electrical Specification: 120V-277V,50/60HZ, 100W

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVAT2-100L730U	Sample ID.	M1
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	120.00	60	0.776	92.9	0.998

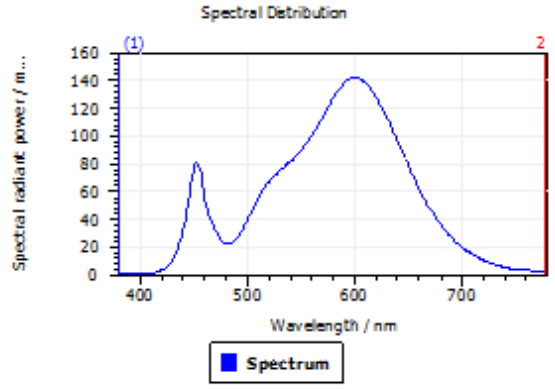
Test Result

CCT (K)	CRI (Ra)	Duv
3056	79.9	7.5E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

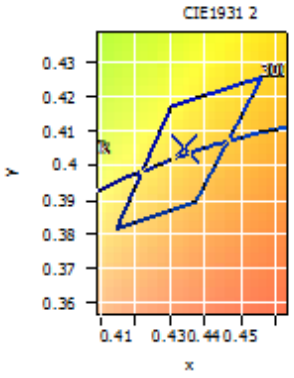
DominantWavelength	582.32 nm
Purity	0.518
PeakWavelength	600.05 nm
Radiant Power	21 W
Width50%:	129.69 nm

Color Coordinates

Correlated Color Temperatu 3056 K

x:	0.4340	u:	0.2483	u':	0.2483
y:	0.4049	v:	0.3475	v':	0.5213

ResultsCRICRI01	77.8	ResultsCRICRI09	-2.9
ResultsCRICRI02	88.2	ResultsCRICRI10	72.8
ResultsCRICRI03	96.1	ResultsCRICRI11	75.7
ResultsCRICRI04	77.5	ResultsCRICRI12	62.8
ResultsCRICRI05	77.2	ResultsCRICRI13	80.1
ResultsCRICRI06	84.6	ResultsCRICRI14	98.2
ResultsCRICRI07	82.3	ResultsCRICRI15	70.0
ResultsCRICRI08	55.8	ResultsCRICRI16	68.0
ResultsCRI	79.9		



PlanckDistance	7.5E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT2-100L730U	Sample ID.	M1
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

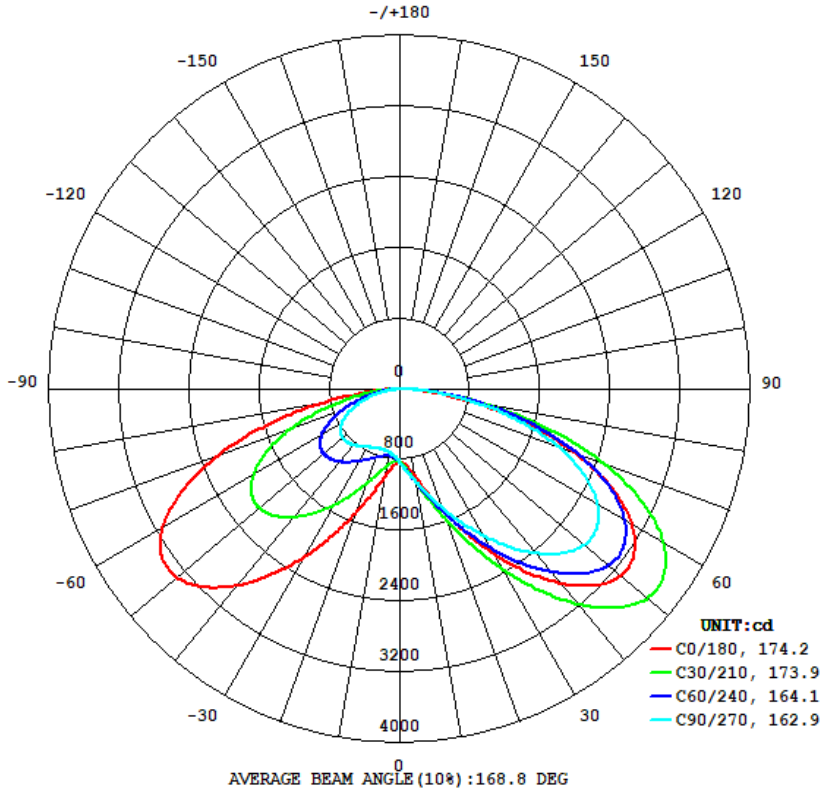
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.02	60	0.775	92.8	0.998	Light Down

Test Result

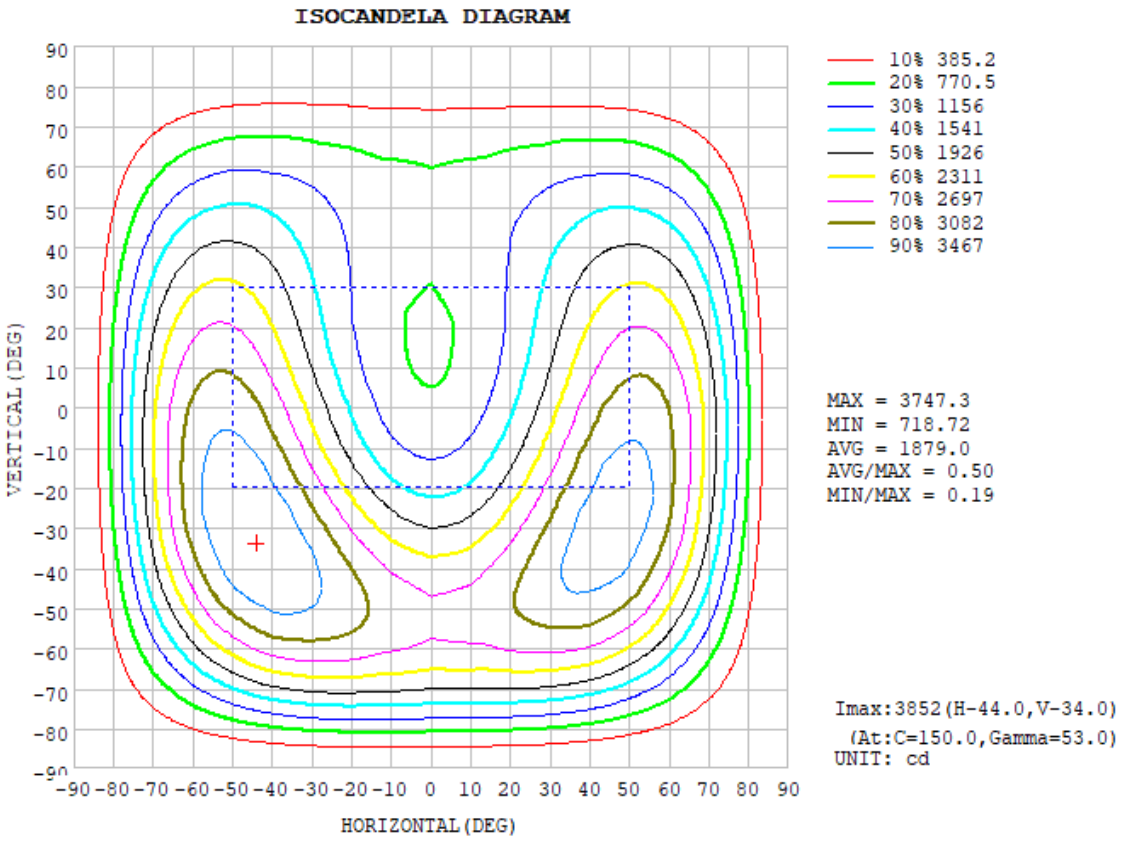
Flux (lm)	Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (80°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
10167	100.00%	3.07%	177.9	163.7	168.5	63.6	109.6

4.3 Goniophotometer Test

Light Distrubtion Curve



Isolux Plot



4.3 Goniophotometer Test

Zonal Lumen Summary

LUMINOUS INTENSITY:cd												
DEG	C0	C45	C90	C135	C180	C225	C270	C315	γ
180	0	0	0	0	0	0	0	0	10	997.4	1065	1058	1070	1007	823.4	732.9	832.0
170	0	0	0	0	0	0	0	0	20	1468	1554	1421	1603	1496	967.1	721.6	995.3
160	0	0	0	0	0	0	0	0	30	2149	2251	1916	2366	2192	1193	766.1	1246
150	0	0	0	0	0	0	0	0	40	2875	3002	2431	3163	2905	1426	835.8	1483
140	0	0	0	0	0	0	0	0	50	3287	3476	2747	3667	3320	1539	860.3	1573
130	0	0	0	0	0	0	0	0	60	3063	3311	2612	3525	3120	1395	762.0	1394
120	0	0	0	0	0	0	0	0	70	2136	2396	1934	2599	2207	964.3	513.9	936.9
110	0	0	0	0	0	0	0	0	80	800.7	997.5	872.0	1124	865.0	355.7	180.2	322.6
100	0	0	0	0	0	0	0	0	90	0	0	0	0	0	0	0	0

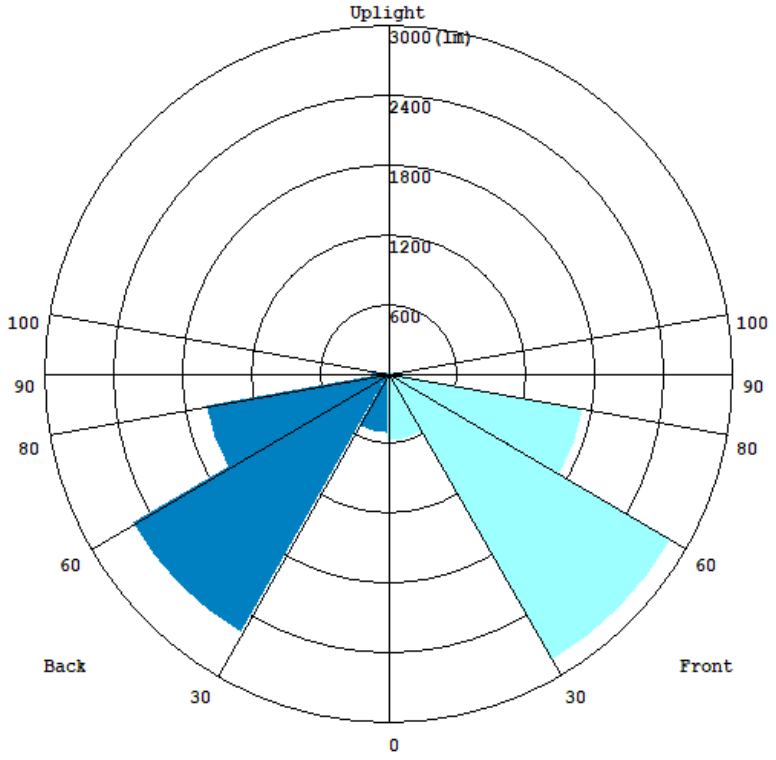
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	84.95	0 - 10	84.95	0.84%
10-20	315.99	0 - 20	400.94	3.94%
20-30	704.95	0 - 30	1105.89	10.88%
30-40	1271.31	0 - 40	2377.20	23.38%
40-50	1886.34	0 - 50	4263.54	41.94%
50-60	2251.02	0 - 60	6514.56	64.08%
60-70	2065.06	0 - 70	8579.62	84.39%
70-80	1275.20	0 - 80	9854.82	96.93%
80-90	312.18	0 - 90	10167.00	100.00%
90-100	0.00	0 - 100	10167.00	100.00%
100-110	0.00	0 - 110	10167.00	100.00%
110-120	0.00	0 - 120	10167.00	100.00%
120-130	0.00	0 - 130	10167.00	100.00%
130-140	0.00	0 - 140	10167.00	100.00%
140-150	0.00	0 - 150	10167.00	100.00%
150-160	0.00	0 - 160	10167.00	100.00%
160-170	0.00	0 - 170	10167.00	100.00%
170-180	0.00	0 - 180	10167.00	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	589.51	5.8
FM - Front-Medium(30-60)	2847	28.0
FH - Front-High(60-80)	1732.6	17.0
FVH - Front-Very High(80-90)	146.94	1.4
Total Forward Light	5316	52.2

BL - Back-Low(0-30)	517.21	5.1
BM - Back-Medium(30-60)	2579.5	25.3
BH - Back-High(60-80)	1617.6	15.9
BVH - Back-Very High(80-90)	145.4	1.4
Total Back Light	4859.7	47.8

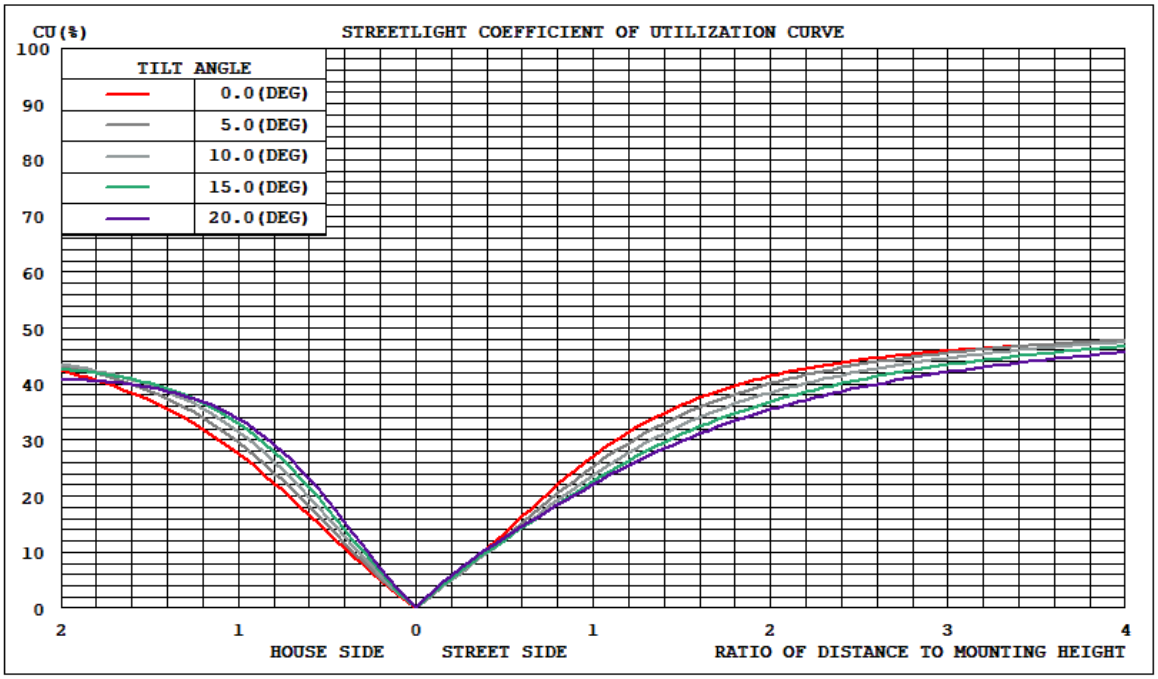
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

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

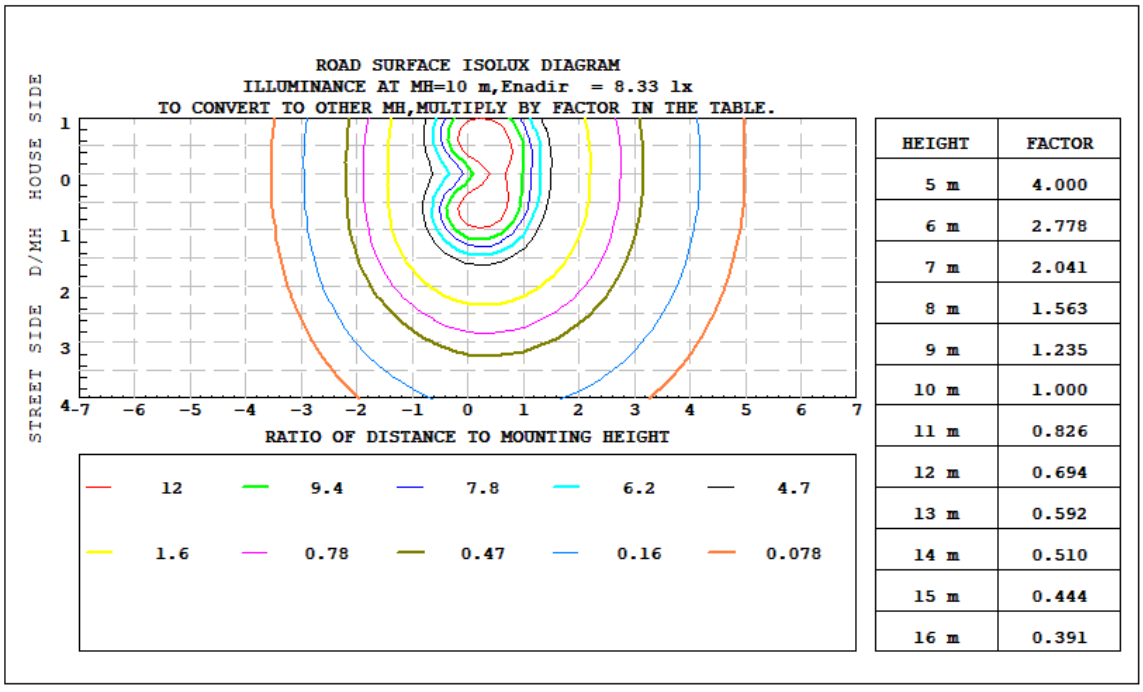
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4859.7	0	4859.7
Street Side	5316	0	5316

3.2 Goniophotometer Test

Coefficients of Utilization



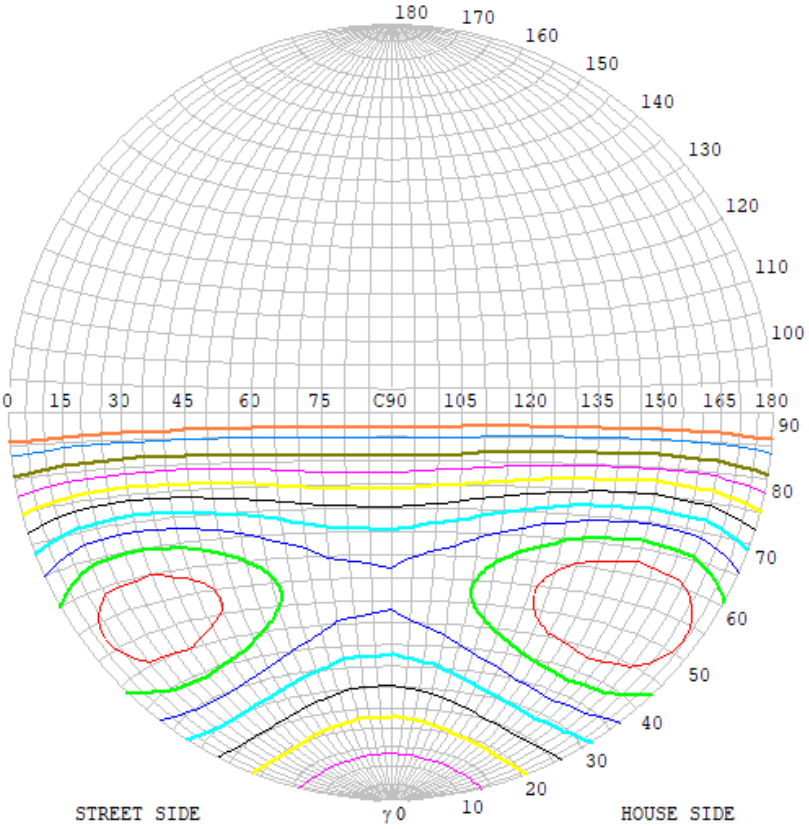
Iso-footcandle Lines of Horizontal Illumination



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

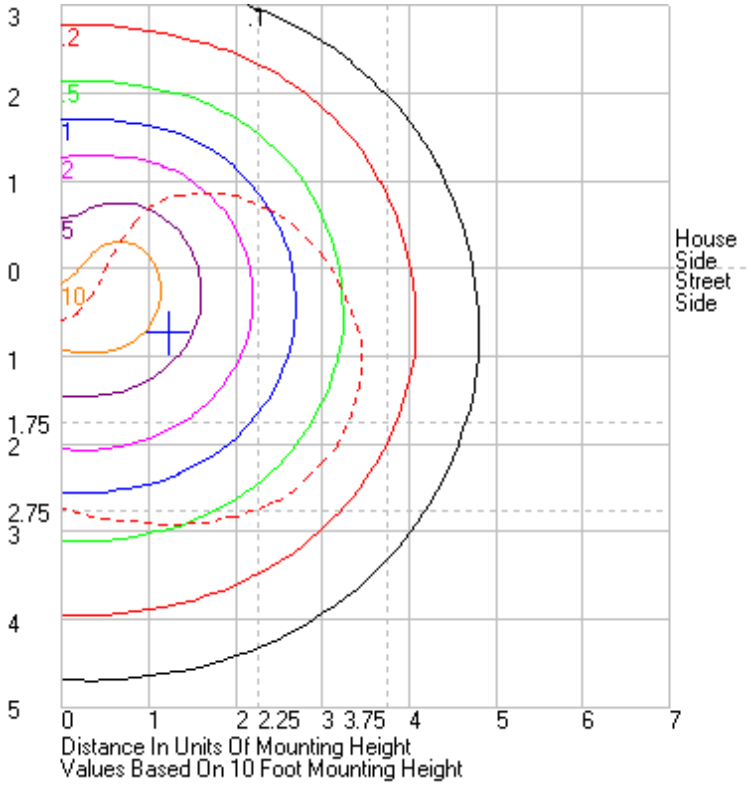


Classification:

IES:Type IV - Short
CIE:Average - Short
IES:Semi cut-off
CIE:Non-cut-off
Max.At80:111.4cd/klm
Max.At90:0cd/klm
Max.80-90:111.4cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	3874
90%	3486
80%	3099
70%	2711
60%	2324
50%	1937
40%	1549
30%	1162
20%	775
10%	387
5%	194

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT2-100L730U	Sample ID.	M1

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	277.03	60	0.335	89.6	0.964	8.79%
25.1	120.00	60	0.776	92.9	0.998	4.71%

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**********