Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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Prepared By	**Approved By**
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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	10095	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	120	108.9	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	⩾99%	100.00%	P
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	⩽10%	3.74%	P
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	4095	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	73	P
Power Factor	ANSI C82.77:2014	0.873	0.963	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	8.89%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/10/24	IVAT2-100L740U	L1
2	Goniophotometer Test	2018/10/24	IVAT2-100L740U	L1
3	THD and PF Test	2018/10/24	IVAT2-100L740U	L1

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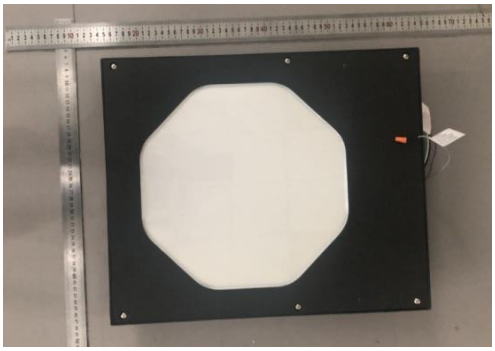
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing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

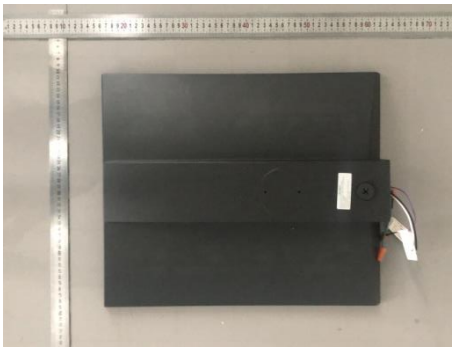
3.0 Production Description

Luminaire Description: IVAT2-100L740U

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.	IVAT2-100L740U	Sample ID.	L1
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	119.98	60	0.767	91.9	0.998

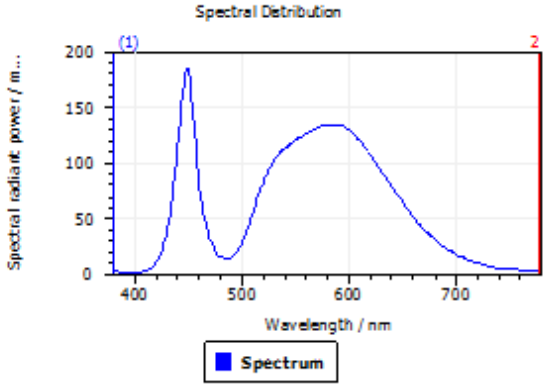
Test Result

CCT (K)	CRI (Ra)	Duv
4095	73.3	4.0E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

DominantWavelength	581.41 nm
Purity	0.215
PeakWavelength	448.67 nm
Radiant Power	23.45 W
Width50%:	21.04 nm

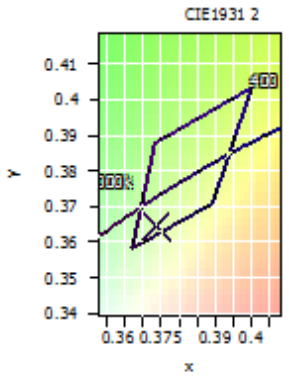
Color Coordinates

Correlated Color Temperatu 4095 K

x:	0.3739	u:	0.2258	u':	0.2258
y:	0.3643	v:	0.3300	v':	0.4950

ResultsCRICRI01	72.5	ResultsCRICRI09	-10.5
ResultsCRICRI02	78.7	ResultsCRICRI10	47.0
ResultsCRICRI03	80.9	ResultsCRICRI11	68.5
ResultsCRICRI04	73.5	ResultsCRICRI12	39.7
ResultsCRICRI05	71.2	ResultsCRICRI13	73.0
ResultsCRICRI06	68.4	ResultsCRICRI14	88.7
ResultsCRICRI07	81.4	ResultsCRICRI15	68.7
ResultsCRICRI08	59.8	ResultsCRICRI16	71.0

ResultsCRI 73.3



PlanckDistance 4.0E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVAT2-100L740U	Sample ID.	L1
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

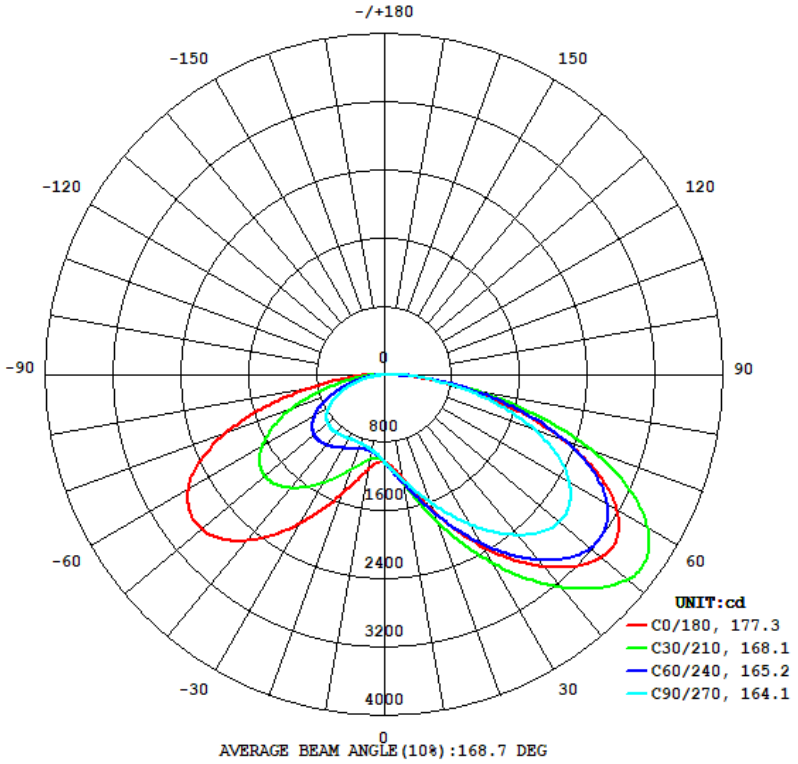
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	120.05	60	0.774	92.7	0.998	Light Down

Test Result

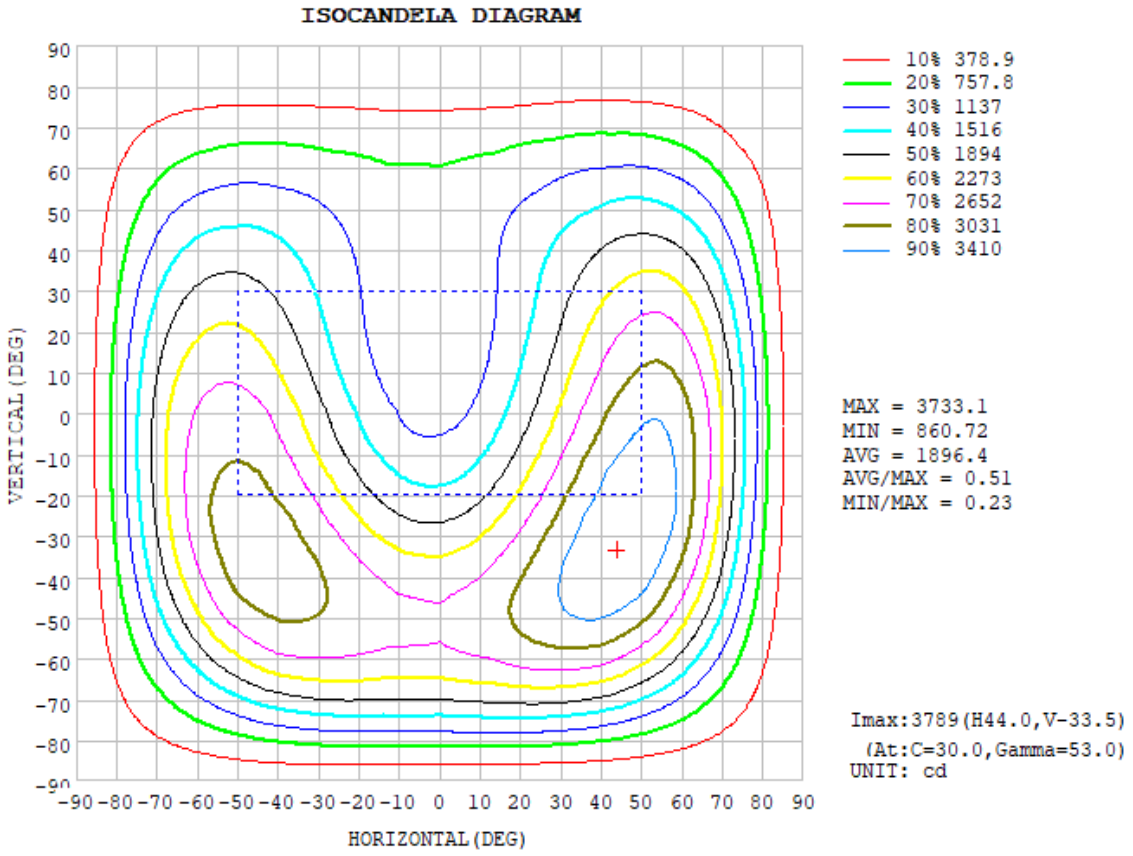
Flux (lm)	Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (80°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
10095	100.00%	3.74%	177.2	164.8	166.7	62.7	108.9

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	1231	1299	1255	1208	1124	959.2	904.7	1043
20	1708	1803	1593	1616	1485	1040	861.6	1200
30	2333	2463	2032	2184	2014	1203	868.0	1422
40	2945	3113	2460	2788	2544	1363	894.9	1622
50	3331	3533	2693	3151	2822	1411	881.5	1676
60	3175	3418	2527	3062	2674	1257	759.9	1479
70	2263	2516	1887	2354	1993	867.4	505.7	1014
80	936.4	1125	918.2	1117	892.4	355.2	167.1	393.0
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

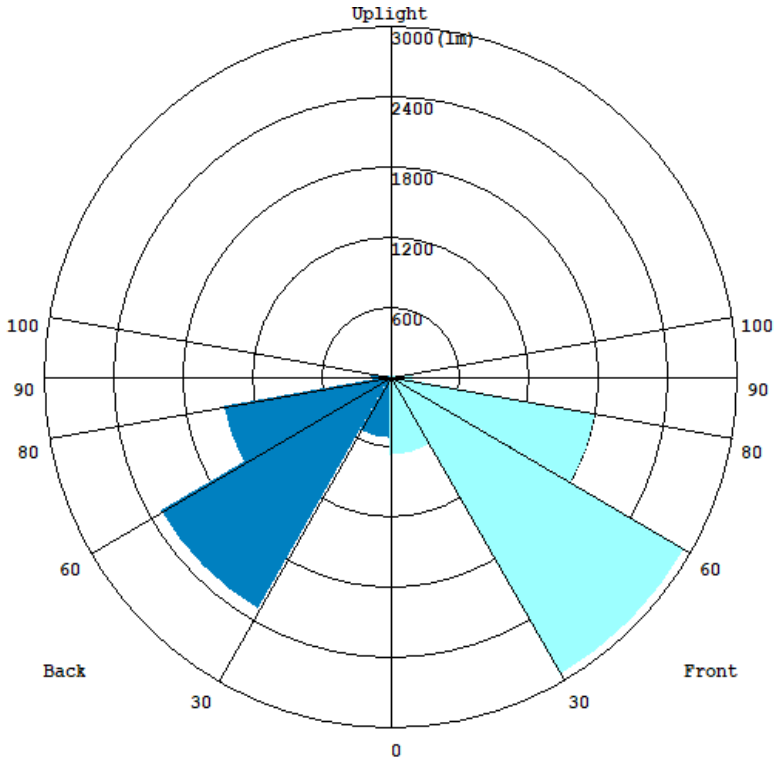
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	102.83	0 - 10	102.83	1.02%
10-20	360.51	0 - 20	463.34	4.59%
20-30	749.27	0 - 30	1212.61	12.01%
30-40	1272.52	0 - 40	2485.13	24.62%
40-50	1817.09	0 - 50	4302.22	42.62%
50-60	2145.38	0 - 60	6447.60	63.87%
60-70	1991.40	0 - 70	8439.00	83.60%
70-80	1278.30	0 - 80	9717.30	96.26%
80-90	377.37	0 - 90	10094.67	100.00%
90-100	0.00	0 - 100	10094.67	100.00%
100-110	0.00	0 - 110	10094.67	100.00%
110-120	0.00	0 - 120	10094.67	100.00%
120-130	0.00	0 - 130	10094.67	100.00%
130-140	0.00	0 - 140	10094.67	100.00%
140-150	0.00	0 - 150	10094.67	100.00%
150-160	0.00	0 - 160	10094.67	100.00%
160-170	0.00	0 - 170	10094.67	100.00%
170-180	0.00	0 - 180	10094.67	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	682.27	6.7
FM - Front-Medium(30-60)	2950.2	29.2
FH - Front-High(60-80)	1814.6	17.9
FVH - Front-Very High(80-90)	197.27	1.9
Total Forward Light	5644.4	55.8

BL - Back-Low(0-30)	531.17	5.2
BM - Back-Medium(30-60)	2299.5	22.7
BH - Back-High(60-80)	1464.4	14.5
BVH - Back-Very High(80-90)	179.34	1.8
Total Back Light	4474.4	44.2

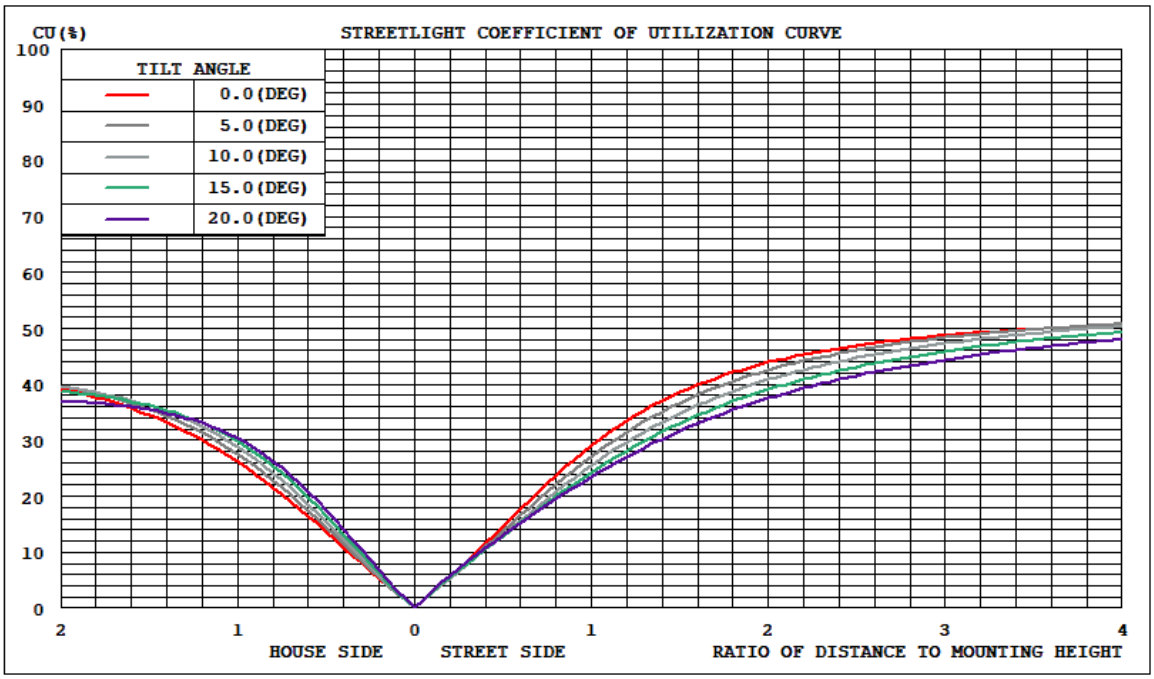
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

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

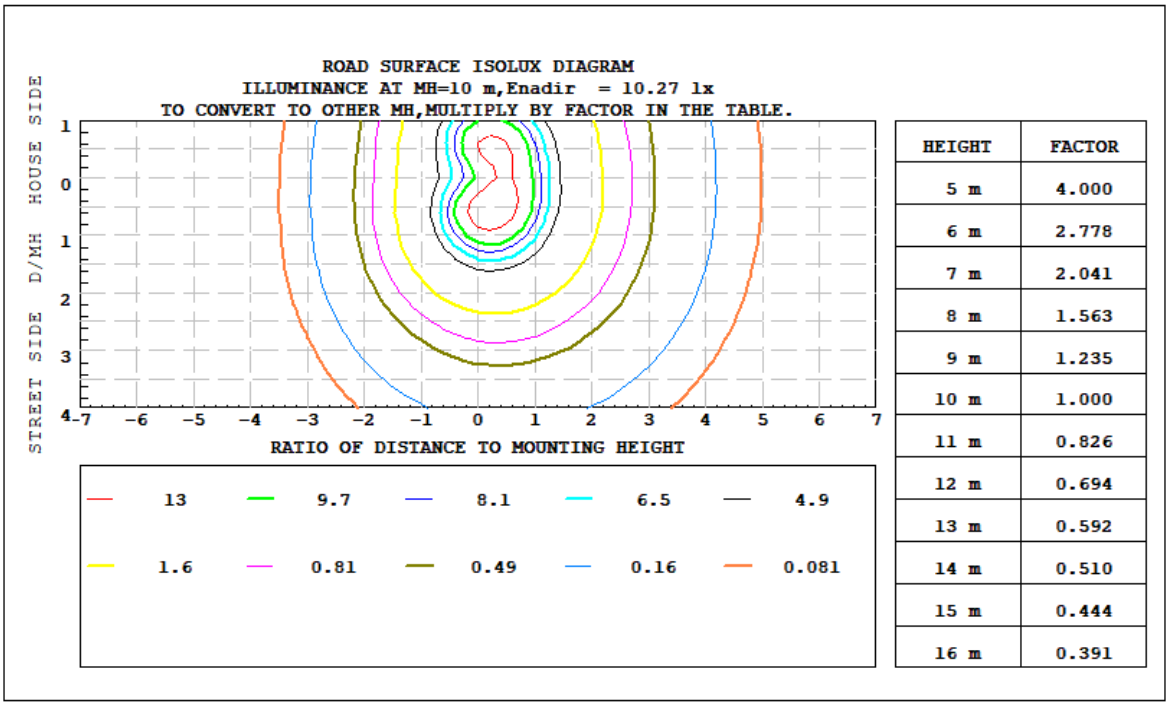
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4474.4	0	4474.4
Street Side	5644.4	0	5644.4

3.2 Goniophotometer Test

Coefficients of Utilization



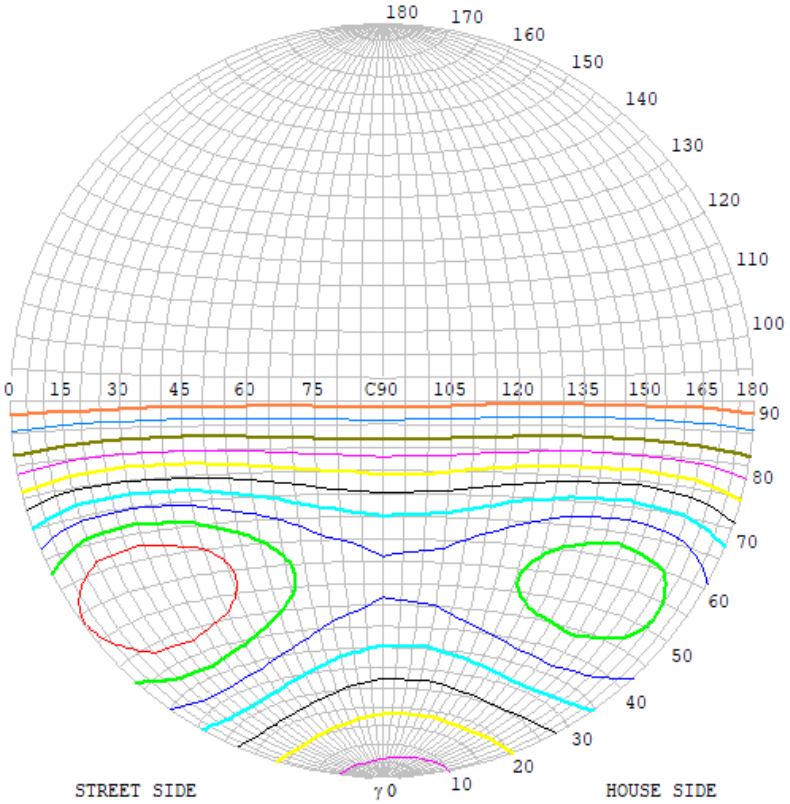
Iso-footcandle Lines of Horizontal Illumination



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

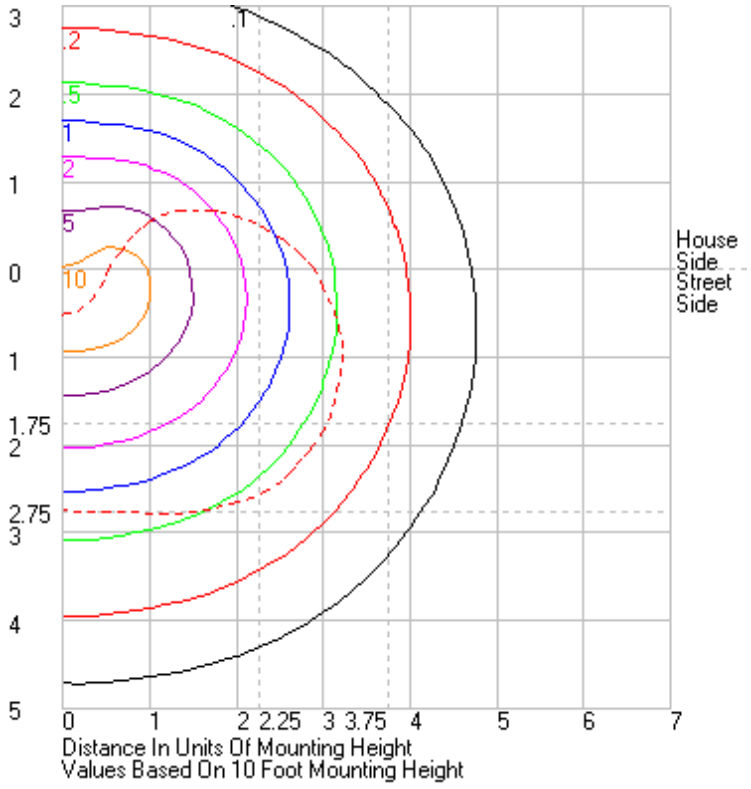


Classification:

IES:Type IV - Short
CIE:Broad - Short
IES:Semi cut-off
CIE:Non-cut-off
Max.At80:111.2cd/klm
Max.At90:0cd/klm
Max.80-90:111.2cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	3791
90%	3412
80%	3033
70%	2654
60%	2275
50%	1896
40%	1516
30%	1137
20%	758
10%	379
5%	190

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVAT2-100L740U	Sample ID.	L1

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	60	0.334	89.1	0.963	8.89%
25.1	119.98	60	0.767	91.9	0.998	4.97%

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-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**********