Photometric Test Report

Relevant Standards

☑IES LM-79-2008
☑ANSI C82.77:2014

Prepared For

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Project Number
DLF1811113

Data Number
DLF1811113-17a

Test Date
2018/11/22

Issue Date
2018/11/23

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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	10792
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	100	110.2
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	⩾99%	100.00%
Zonal Lumen Requirement (80°-90°)	IES LM-79-2008	⩽10%	4.00%
Alowable CCTs* (K)	IES LM-79-2008	⩽5700	5287
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	⩾65	76.4
Power Factor	ANSI C82.77:2014	0.873	0.954
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	12.75%

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/11/22	IVATFT-100L750[H, 4]	Q1
2	Goniophotometer Test	2018/11/22	IVATFT-100L750[H, 4]	Q1
3	THD and PF Test	2018/11/22	IVATFT-100L750[H, 4]	Q1

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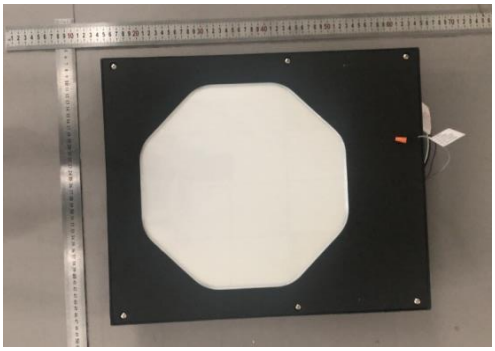
2、The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report apply to the test sample(s) mentioned above at the time of the testing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

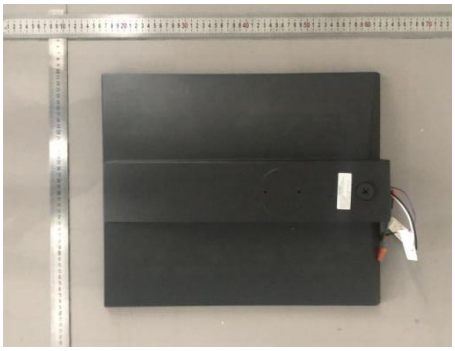
3.0 Production Description

Luminaire Description: IVATFT-100L750[H, 4]

Electrical Specification: 480V,50/60HZ, 45W

Photos of Luminaire Characteristics





4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	IVATFT-100L750[H, 4]	Sample ID.	Q1
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	479.95	60	0.214	97.8	0.954

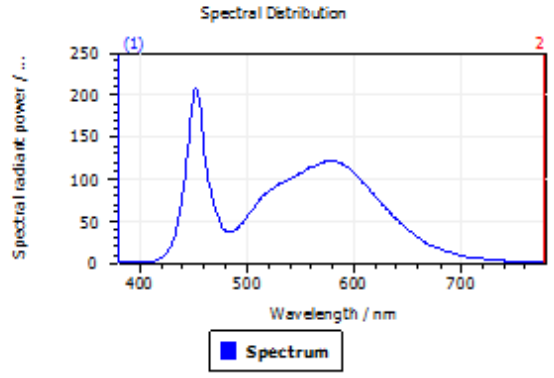
Test Result

CCT (K)	CRI (Ra)	Duv
5287	76.4	5.4E-04

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral Distribution

Spectral values

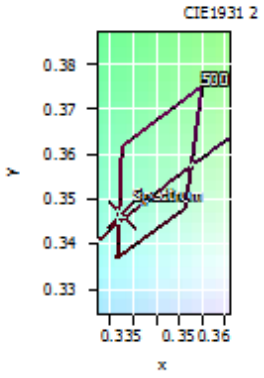
DominantWavelength	565.81 nm
Purity	0.053
PeakWavelength	452.14 nm
Width50%:	20.75 nm

Color Coordinates

Correlated Color Temperatu		5287 K			
x:	0.3376	u:	0.2083	u':	0.2083
y:	0.3465	v:	0.3207	v':	0.4810

CRI01	73.3	CRI09	-25.6
CRI02	83.4	CRI10	60.1
CRI03	89.4	CRI11	72.1
CRI04	74.8	CRI12	50.6
CRI05	74.6	CRI13	75.8
CRI06	76.1	CRI14	94.4
CRI07	82.5	CRI15	67.1
CRI08	56.8	CRI16	65.9

ResultsCRI 76.4



PlanckDistance 5.4E-004

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	IVATFT-100L750[H, 4]	Sample ID.	Q1
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

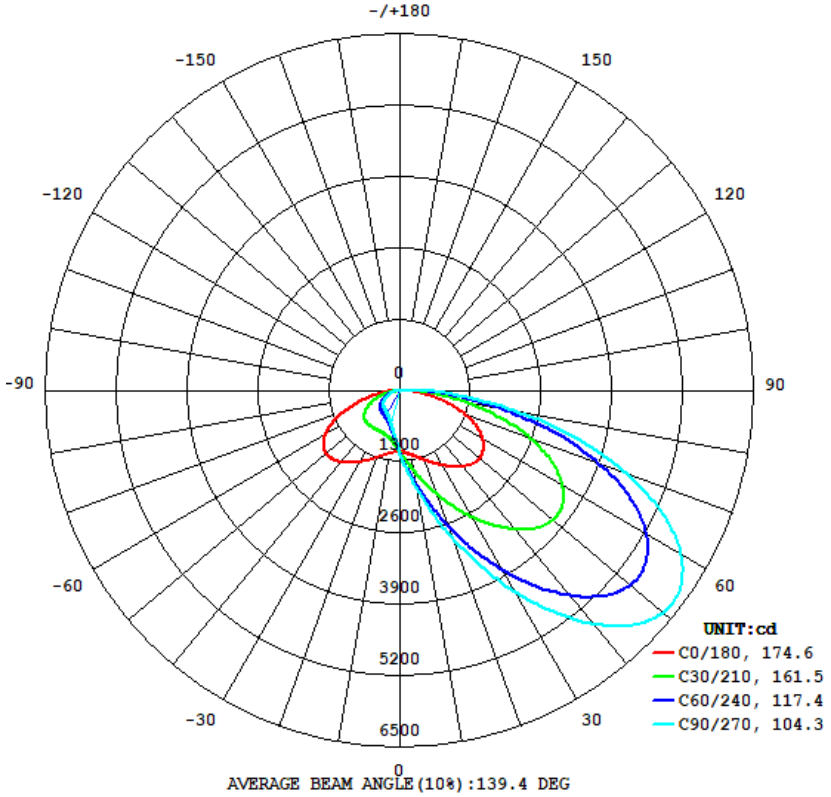
Temperature (° C)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	408.02	60	0.252	97.9	0.954	Light Down

Test Result

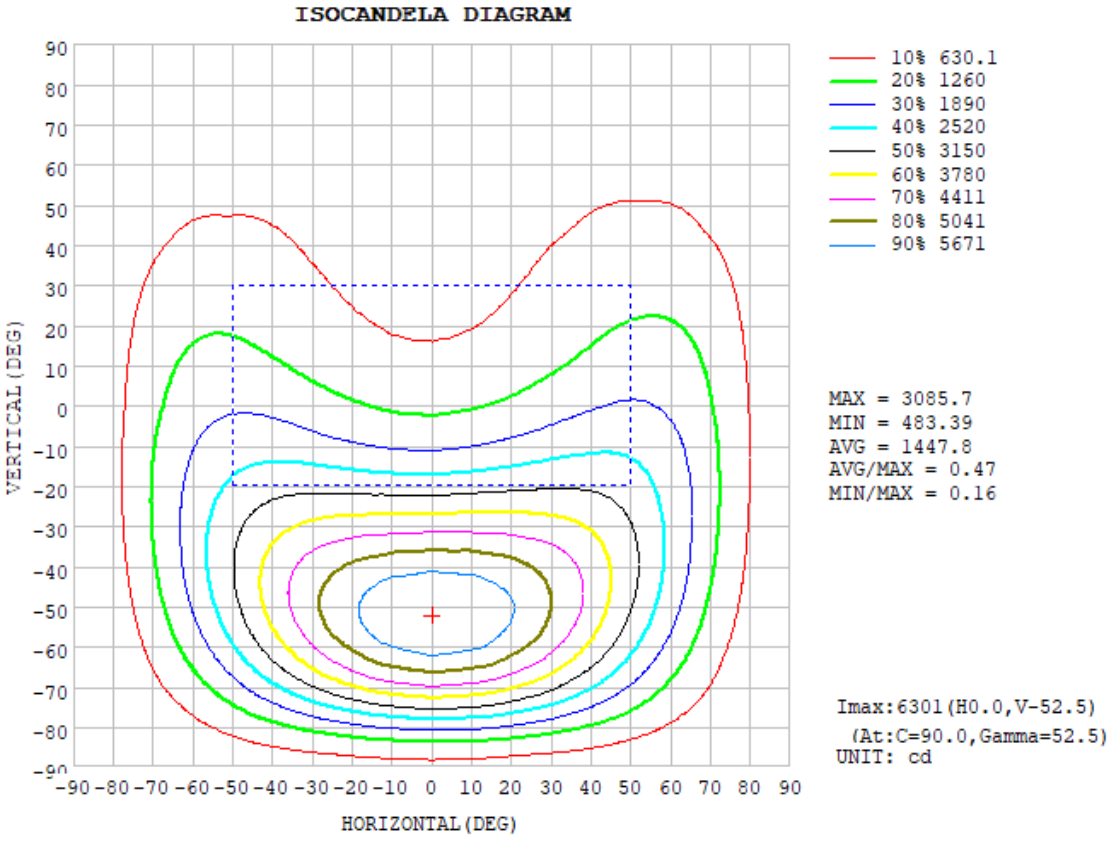
Flux (lm)	Zonal Lumen Requirement (0°-90°)	Zonal Lumen Requirement (80°-90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
			Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
10792	100.00%	4.00%	178.4	162.7	167.6	61.4	110.2

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	1192	1602	1788	1568	1169	852.3	754.2	872.0
20	1356	2345	2865	2273	1307	718.7	574.0	750.2
30	1580	3251	4226	3172	1510	660.8	486.0	697.5
40	1807	4136	5553	4038	1711	641.2	440.5	678.9
50	1921	4650	6305	4498	1781	611.7	399.4	650.5
60	1772	4396	5960	4198	1579	520.1	329.3	561.2
70	1296	3267	4429	3074	1093	347.6	219.2	386.2
80	599.0	1564	2122	1439	432.5	131.6	89.09	156.3
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

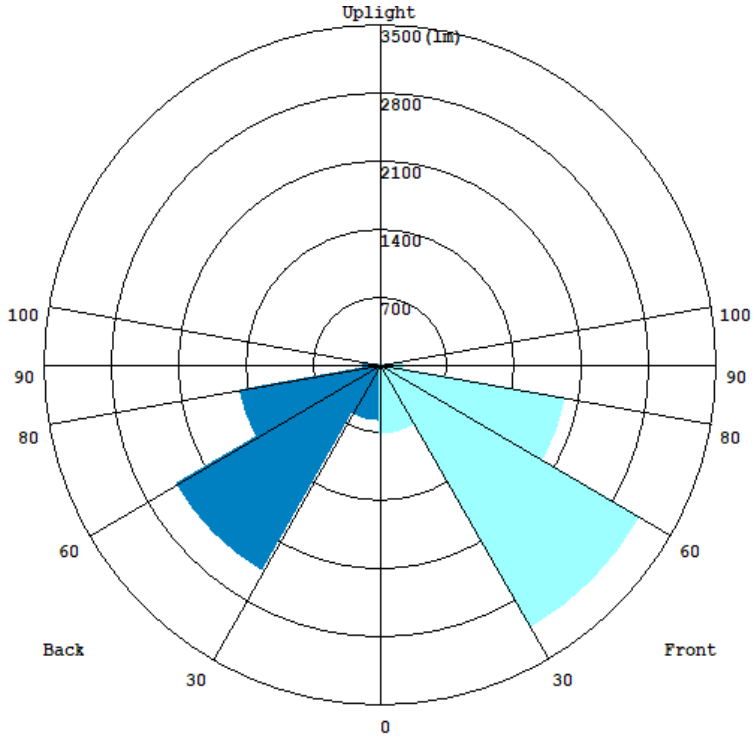
4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0-10	111.85	0 - 10	111.85	1.04%
10-20	389.79	0 - 20	501.64	4.65%
20-30	805.75	0 - 30	1307.39	12.11%
30-40	1364.70	0 - 40	2672.09	24.76%
40-50	1944.85	0 - 50	4616.94	42.78%
50-60	2276.58	0 - 60	6893.52	63.87%
60-70	2097.56	0 - 70	8991.08	83.31%
70-80	1369.44	0 - 80	10360.52	96.00%
80-90	431.73	0 - 90	10792.25	100.00%
90-100	0.00	0 - 100	10792.25	100.00%
100-110	0.00	0 - 110	10792.25	100.00%
110-120	0.00	0 - 120	10792.25	100.00%
120-130	0.00	0 - 130	10792.25	100.00%
130-140	0.00	0 - 140	10792.25	100.00%
140-150	0.00	0 - 150	10792.25	100.00%
150-160	0.00	0 - 160	10792.25	100.00%
160-170	0.00	0 - 170	10792.25	100.00%
170-180	0.00	0 - 180	10792.25	100.00%

3.2 Goniophotometer Test

LCS Graph



BUG-Rating

IESNA Luminaire Flux Distribution Table:

Zone	Lumens	Luminaire %
FL - Front-Low(0-30)	724.3	6.7
FM - Front-Medium(30-60)	3143.6	29.0
FH - Front-High(60-80)	1980.8	18.3
FVH - Front-Very High(80-90)	258.76	2.4
Total Forward Light	6107.4	56.4

BL - Back-Low(0-30)	583.92	5.4
BM - Back-Medium(30-60)	2455.6	22.7
BH - Back-High(60-80)	1494	13.8
BVH - Back-Very High(80-90)	183.31	1.7
Total Back Light	4716.8	43.6

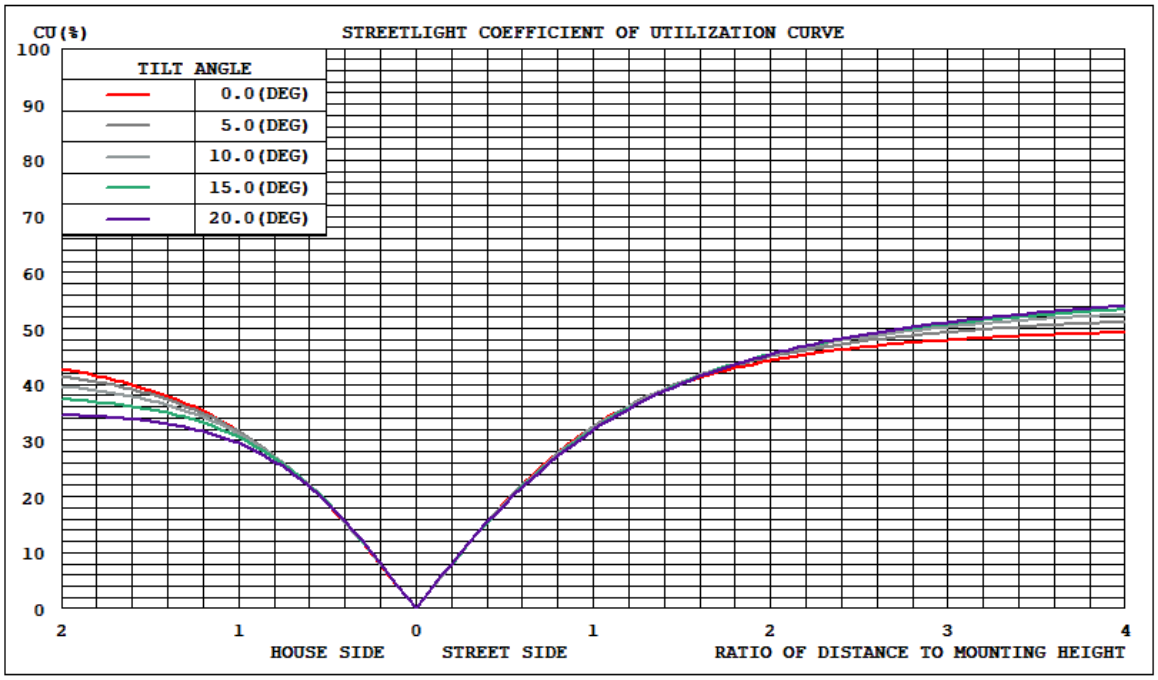
UL - Uplight-Low(90-100)	0	0.0
UH - Uplight-High(100-180)	0	0.0
Total Up Light	0	0.0

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

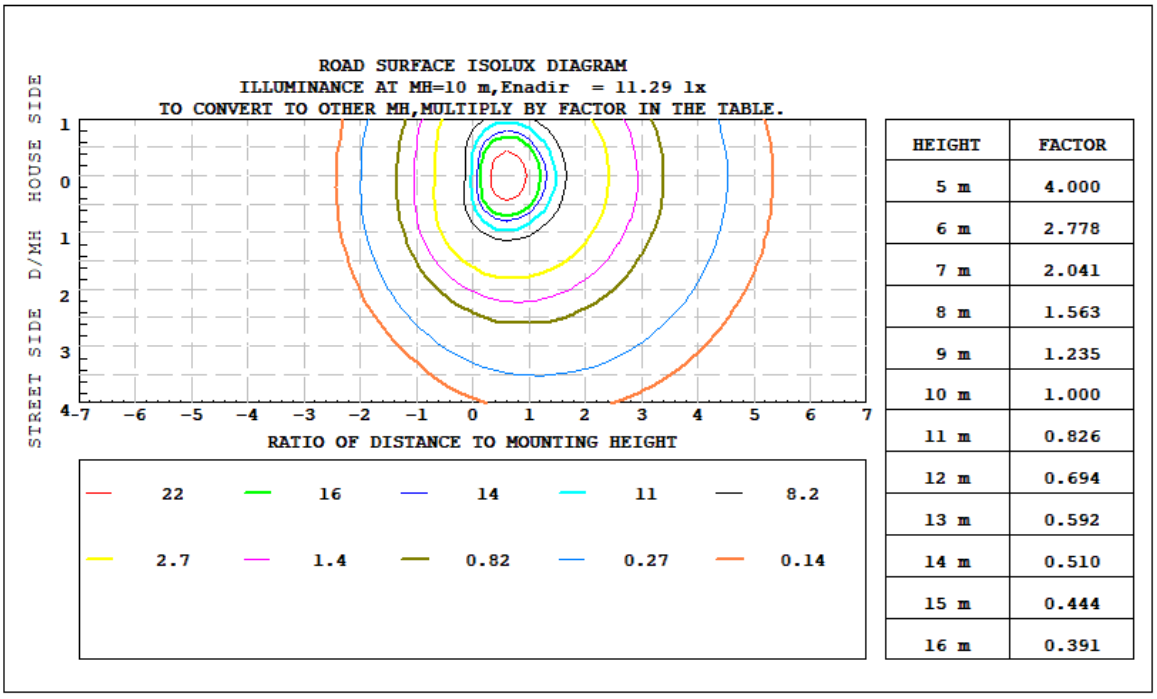
Zone	Downward Lumens	Upward Lumens	Total Lumens
House Side	4716.8	0	4716.8
Street Side	6107.4	0	6107.4

3.2 Goniophotometer Test

Coefficients of Utilization



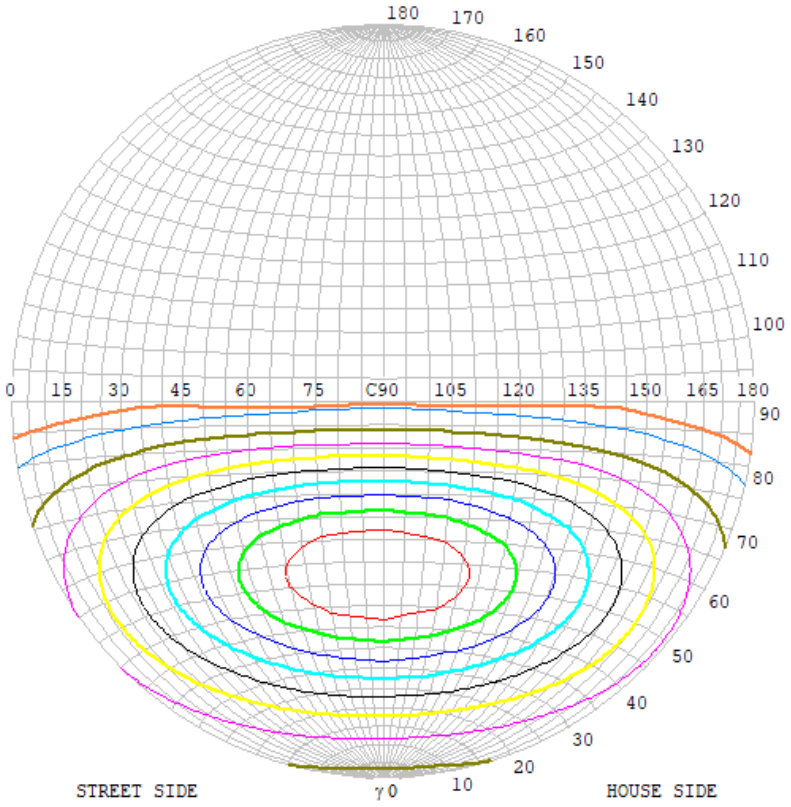
Iso-footcandle Lines of Horizontal Illumination



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

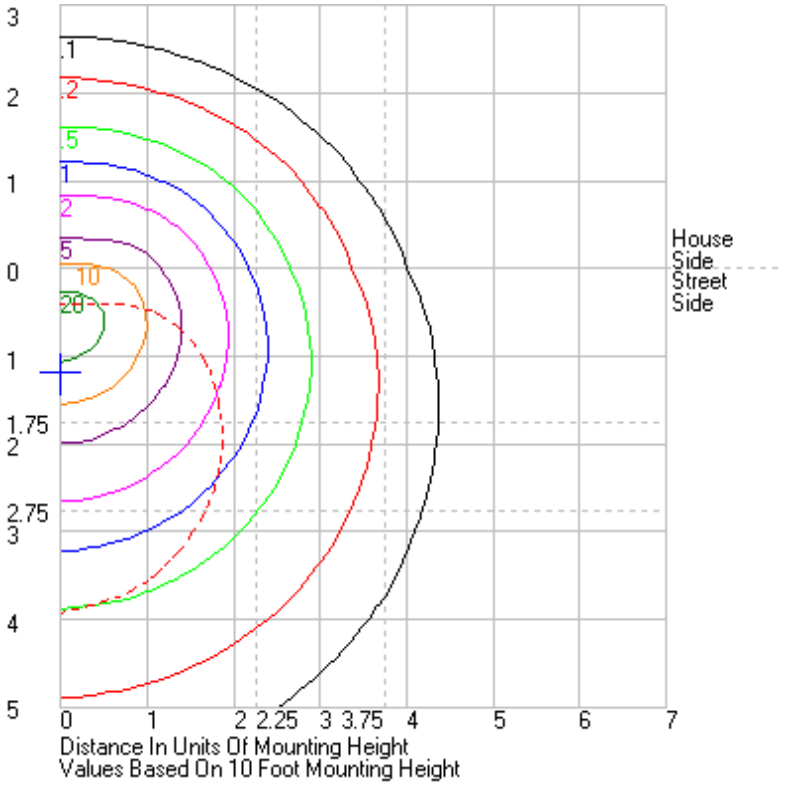


Classification:

IES:Type II - Very Short
CIE:Narrow - Short
IES:Semi cut-off
CIE:Non-cut-off
Max.At80:196.1cd/klm
Max.At90:0cd/klm
Max.80-90:196.1cd/klm

ISOCANDELA DIAGRAM	
UNIT	cd
Imax=100%	6335
90%	5701
80%	5068
70%	4434
60%	3801
50%	3167
40%	2534
30%	1900
20%	1267
10%	633
5%	317

ROAD ISOCANDELA REPORT



5.0 THD and PF Test

Model No.	IVATFT-100L750[H, 4]	Sample ID.	Q1

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	479.95	60	0.214	97.8	0.954	12.75%

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**********